# Management of locally recurrent rectal cancer.

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## P01

### Prediction value of "Kudo" classification of polyps in colon – single center prospective study

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**Background.** Classification of polyps according to professor Kudo – pit pattern is a globally accepted method of predicting of biological character of polyps in colon. Asiatic endoscopists assign this method great diagnostic importance and the world renowned endoscopic centers use the "Kudo" classification of a found polyp during a colonoscopy as the only bases of deciding how to deal with it. The question arises, whether it is possible to believe this method of classification unconditionally even in our conditions.

**Methods.** The goal of our prospective study was to evaluate diagnostic predictive values of "Kudo" classification of colon polyps in Czech Republic. The system used to describe a colonoscopy examination in endoscopy unit at IKEM is interconnected with a central data base and a description of each first colonoscopy for any patient is structured in such a way as to describe each found polyp according to its size, its color, its shape and also using the Kudo (pit-pattern I–V). Endoscopically extracted polyps are sent for a histology examination. There the polyps are classified as neoplastic or non-neoplastic and the result is also entered into the data base. The data obtained have been statistically evaluated.

**Results.** A total of 1030 colonoscopic records were analyzed. The mean rate of caecum intubation was 92%. The most frequent indication for colonoscopy was pain (35%) followed by enterorrhage (21%) and changes in stool habits (20%). 978 polyps in 450 patients (42.5%), 32 laterally spreading lesions in 32 patients (3.5%) and 55 carcinomas in 55 patients (5%). 570 polyps were evaluated by a pathologist as neoplastic polyp (60%) found in 250 patients (tubular adenoma 400 tubulo-villous adenoma 130, villous adenoma 4, adenocarcinoma 10 – for various reasons (thermo damage...) it was not possible to evaluate the rest). Out of all adenomas there were 391 with low degree of dysplasia 50 with high degree of dysplasia. There were 400 non-neoplastic polyps found. Into this group were also added serrated type of polyps, 4 all together. Out of the group of neoplastic polyps, there were 310 classified using "Kudo" classification (58%) and 140 non-neoplastic polyps (40%) respectively. In the group of the neoplastic polyps there were 298 (96%) evaluated as pit pattern III and higher. In the non-neoplastic polyps group there were 113 polyps (81%) classified as pit pattern I and II. All the serrated polyps were classified as pit pattern III (as neoplastic).

**Conclusions.** From the analysis of the above data, it was found that the sensitivity of "Kudo" classification in our center was 91.7% and specificity 90.4%. These values do not reach the values found by the Japanese specialists, nevertheless, in European region the values are above average.

## P02

### Expected and surprising outcomes of colorectal cancer screening programme based on Fobt and colonoscopy in area with high incidency of this malignancy

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**Background.** The incidence of colorectal cancer in the Czech Republic is continuously increasing, approaching 80/100,000 pop. per year. A national screening programme based on the biennial fecal occult blood test (FOBT) and colonoscopy, in the event of FOBT positivity, was launched in 2000. The total number of colonoscopies increased roughly by 50%, reaching approximately 130,000 (3.5% of the eligible population) per year. The number of FOBT has multiplied.

**Methods.** The aim of this prospective multicenter study was to assess the potential role of colonoscopy in the diagnosis and screening of colorectal cancer in the conditions of an officially declared screening programme.

**Results.** A total of 1030 colonoscopic reports made between 08/08 and 04/09 were analyzed. The mean rate of caecum intubation was 92%. The most frequent indication for colonoscopy was pain (35%) followed by enterorrhage (21%) and changes in stool habits (20%). Overall, 103 (10%) colonoscopies were performed as an official screening method following either positive FOBT. A total of 75 (7.2%) colonoscopies were performed as a primary screening procedure without previous FOBT (altogether 178–18% – screening procedures). 978 polyps in 450 patients (42.5%), 79 advanced adenomas in 98 patients (9.0%), and 55 (5%) carcinomas were found. In 106 patients reporting a positive family history, carcinoma was detected in 2 (2%) and advanced adenoma in 6 (5.5%) of them, which was lower than in 924 patients without a positive family history (53 cancers: 5.1%, 73 advanced adenomas: 7.1%). Among 210 patients reporting blood in the stool, 28 patients underwent FOBT (20 positive, 8 negative). In patients with enterorrhage, carcinomas were found in 21 (10%) patients, which is higher than

their occurrence in other patiens (34 cancers). Altogether, 30 (38.1%) advanced adenomas and 18 (33.7%) carcinomas were detected by screening.

**Conclusions.** We proved yield of the screening programme based on FOBT and colonoscopy, since a relatively high proportion of all colonoscopies was indicated either after FOBT or as primary screening procedures, and a relatively high proportion of advanced lesions was detected by screening. Surprisingly, in patients with a positive family history, the detection rate of significant lesions was rather low, which could be explained by the relatively high rate of screening procedures in this group. The consequences of the screening process have to be analyzed with caution.

## P03

## Are there other indicators of quality of colonoscopy than adenoma detection rate (ADR)?

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**Background.** Caecum intubation rate (CR) is historically the most commonly used indicator of quality of colonoscopy. However, nowadays this indicator is not enough and it has been frequently replaced by adenoma detection rate (ADR) in combination with extraction time (ET). The aim of our study was to evaluate various parameters of colonoscopy in order to develop a new more precise indicator of quality of colonoscopy.

**Methods.** We have used a structured database used to generate medical reports about colonoscopies at our endoscopy unit for retrospective evaluation. This database is interconnected with a register of histological findings which provided data about histological examinations. The individual data was statistically evaluated using correlation tests (Spearman's coefficient).

**Results.** We have evaluated 1360 consecutive colonoscopies altogether, which were carried out by 6 experts. Each one of the endoscopists had performed more than 250 colonoscopies in a year and more than 1000 colonoscopies during his carrier. The average time of the procedure was 16 minutes (10–23 min). CR was 96% (93–97%), reaching of terminal ileum 90% (87–93%), ADR 30% (21–40%), the average number of polyps in colonoscopies where polyps were found was 2.4 (2.1–2.7), detection of colorectal cancer 4% (3–5%), detection of flat lesions 8% (5–11%). Correspondence of histological findings with evaluation of polyps using KUDO classification was 91% (86–96%). The percentage of extracted significant polyps was 80% (66–93%). The histologically complete polypectomy rate (HCPR) of significant polyps was 51% (32–69%). The percentage of colonoscopies without pre-medication was 44% (30–58%). The time between polypectomy of significant lesion and check up colonoscopy was 15 months (6–24). The percentage of complications after therapeutic colonoscopies was 1% (0–2%).

**Conclusions.** ADR is above 20% which is a tolerable lower limit. ADR of the individual experts appears to be a factor which is not dependent on the length of the procedure and on the CR. The HCPR significantly correlates with the ADR, the length of procedure and CR. The HCPR appears to be an ideal indicator of the quality of a colonoscopy.

## P04

## Use of buscopan improves polyp detection rate during colonoscopy withdrawal (a retrospective audit)

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**Background.** Polyp miss rate may be as high as 27% for lesions <5 mm and 12% if >10 mm. Part of this miss rate may be due to inadequate visualization of mucosal surface. Use of buscopan during colonoscopy to improve polyp detection is debatable and practice varies largely between colonoscopists. There is little data to support its use.

**Aim.** To assess the effect of buscopan on polyp detection rate.

**Methods.** A retrospective audit was under taken between 1.04.2009 and 31.03.2010 including all patients who underwent colonoscopy during this period by a single colonoscopist. These included both symptomatic and screening patients. Total number of colonoscopies performed was 214, Buscopan $n = 104$, Non Buscopan $n = 110$. Buscopan was given at the caecum and on withdrawal. The reason for not using Buscopan in the Non Buscopan group was either due to lack of intravenous access, contraindication to buscopan or overlooked during procedure. Primary outcome was Polyp detection with/without Buscopan. Secondary outcome was detection of adenoma and metaplastic polyps.

**Results.** The two groups were similar in age and sex. The overall unadjusted caecal intubation rate was 93% with 95% in Buscopan group and 91% in the non Buscopan group. Polyps were detected in 32.72% in Non Buscopan group (Adenoma 30.90%/Metaplastic 1.81%) and 59.61% in Buscopan group (Adenoma 48.07%/Metaplastic 11.53%). No significant adverse events to Buscopan were encountered.

**Conclusions.** This data suggest that Polyp detection improves significantly in patients who had Buscopan during colonoscopy withdrawal (48.07% *vs.* 30.90%). Research is needed to explore this further.

## P05

### Preoperative colonoscopic localization of tumour with spot tattoo: a review of current practice

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**Background.** The resection of colorectal tumours via a laparoscopic approach requires accurate pre-operative localization of the tumour. Current guidelines state that this should be via 'spot' tattoo placement of 3 tattoos 3 cm away from the tumour at colonoscopy. We aimed to assess the compliance of current practice against these guidelines:

- Proximal lesions (caecum to splenic flexure) tattoos should be placed distal to the lesion.
- Distal lesions (splenic to rectosigmoid) tattoos placed proximal to the lesion.
- Rectosigmoid lesion tattoos placed distal to the lesion.

**Methods.** Retrospective analysis of patients undergoing laparoscopic colorectal resection for colorectal cancer. Data was collected from colonoscopy reports, operation notes and histopathology forms for each patient.

**Results.** We identified 30 patients undergoing laparoscopic resections for colorectal cancer. By current guidelines colonoscopic spot tattooing was indicated in 23 of these patients. Nineteen were tattooed when indicated. In 15 of these there was inadequate documentation of the site of tattoo in relation to the tumour.

**Discussion.** Laparoscopic surgery relies on accurate preoperative tattooing and documentation of the latter. It was found that compliance with trust guidelines for colonoscopic spot tattoo was reasonable but documentation in endoscopy reporting was poor.

**Conclusions.** Although preoperative marking was undertaken in a majority of patients, this was negated by inadequate documentation and confusion in terms of interpretation of the site of tattoo in relation to tumour. We recommend a simplification of guidelines to mark all lesions, irrespective of their location, at 3 cm distal to the lesion.

## P06

### Sonography transmission gel *versus* room-air as endorectal contrast agents in magnetic resonance imaging of rectal cancer

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**Background.** Magnetic resonance imaging (MRI) is increasingly being used for assessment of rectal cancer because of its ability to show tumor extent and depth of invasion. To improve the diagnostic performance, various materials have been proposed to induce rectal distension: ultrasonographic gel, room-air, diluted barium, gadolinium dimeglumine, ferric ammonium citrate, methylcellulose, and warm water. The purpose of this study was to compare ultrasonographic gel *versus* room-air as endorectal contrast agents in MRI of rectal cancer.

**Methods.** Seventy-three rectal MRI examinations in patients with rectal carcinomas were examined: in 43 cases rectal distension was achieved with room-air (prone decubitus), while in 30 cases with 120–180 cc of ultrasonographic gel (supine position). Two radiologists reviewed the examinations and scored them on a five point scale (1–5: excellent-nondiagnostic) with regard to overall image quality, ability to depict the cranio-caudal borders of tumor and the perspicuity of wall tumoral infiltration. The mean scores were compared in the two groups using the Wilcoxon's test for non parametrical data. Statistical significance was defined at $p < 0.05$.

**Results.** The two groups were homogeneous for gender and age. For overall image quality, US gel scored $1.35 \pm 0.64$ *versus* $2.38 \pm 0.85$ of room-air ($p < 0.001$). For cranio-caudal tumoral borders, gel scored $1.32 \pm 0.58$ *versus* $1.72 \pm 0.81$ of room-air ($p = 0.046$). For wall infiltration, gel scored $1.32 \pm 0.58$ *versus* $1.72 \pm 0.81$ of room-air ($p = 0.0001$).

**Conclusions.** In MRI of rectal cancer, rectal distension with ultrasonographic gel is better than distension with room-air for overall image quality, for depiction of cranio-caudal tumoral borders, and for evaluation of wall infiltration.

# Rectal Cancer

## P07

### Perineal approach in abdominoperineal resection of rectum for anorectal cancer

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The classical abdominoperineal resection of rectum entails removal of the mesorectum and the area of the tumour from above. The planes followed are the mesorectal fascia and coning in onto the surface of the sphincters. The anus is then removed from below. This approach means that the most difficult part of the operation, the

removal of the area of tumour and its local tissue is performed from above. The difficult dissection of the tumour might lead to the creation of irregular surgical planes and an increased risk of perforation. The alternative approach and that followed by Mr. T. Holm at the Karolinska Institute, is to dissect the tumour from below with the patient in prone position, after the completion of the abdominal approach. The paper is presenting a number of 82 patients operated on by one author in 5 years, 16 laparoscopically assisted. Thus there is good surgical access with optimum vision and the planes are easier to identify. The quality of resection has been assessed using P. Quirke classification. From below the levators are removed wide and circumferential resection margins are considerably low.

## P08

### The multimodal treatment of rectal cancer – personal experiences based on 125 cases

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**Background.** The gold standard in rectal cancer today is a multimodal approach, tailored for each patient.

**Methods and results.** It is presented the personal experience with 125 cases of rectal cancer treated radically between 2005 and 2009. All patients have undergone a pretherapeutic staging protocol including: rectoscopie with confirmation biopsy, endorectal ultrasound, standard chest radiography, liver ultrasound, CT and/or pelvic and abdominal MRI. The neoadjuvant treatment was; radiotherapy for 81 cases (T3, T4) and chemotherapy was associated in 34 cases. There were 46 resections considered low and very low, with total mezorectal excision; 60 abdomino-perineal rectum excision (16 assisted laparoscopic), 5 local transanal excision for T0 and T1 tumors and 14 Hartmann's operation with total mesorectal excision. Adjuvant treatment was applied to 12 cases. Postoperative complications were: anastomotique leakage – 4, recto-vaginal fistula – 3, urinary dysfunction – 14. Protective ileostomy has been practiced for 35 cases of low and very low resection of the rectum and was closed 6–8 weeks later. Long term results are difficult to quantify due to short-term postoperative follow-up. Local recurrence after anterior resection of the rectum were diagnosed in 2 cases and after abdomino-perineal excision in 2 cases.

**Conclusions.** Multidisciplinary approach for cancer of the rectum associated with an accurate staging and appropriate neoadjuvant treatment make a sphincter saving procedure possible for low rectal cancer.

## P09

### Low anterior resection of the rectum for cancer without mechanical bowel preparation. Early results from a single-centre, randomized clinical trial

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**Background.** Surgical site infections (SSI) in colorectal surgery (anastomotic leakage, wound infection, intraabdominal abscess) are associated with increased mortality, postoperative hospital stay and costs. Data from a recently published randomized study indicate that omitting mechanical bowel preparation (MBP) before low anterior resection of the rectum (LAR) is associated with increasing of SSI.

**Methods.** Patients scheduled for LAR for malignancy with primary anastomosis were randomized to preoperative MBP (4 liters of polyethylene glycol) (Group 1) or single glycerin 5% enema (Group 2). Postoperative incidence of SSI was recorded prospectively.

**Results.** Seventy-three patients were randomized (33, group 1 *vs.* 40, group 2). At least one SSI was registered in 7 out of 33 *vs.* 8 out of 40 patients, group 1 and group 2 respectively; $p = 1.0$). Nearly identical rates of anastomotic dehiscence (4 out of 33 *vs.* 5 out of 40; $p = 1.0$), abdominal abscess (0 *vs.* 0), wound infection (4 out of 33 *vs.* 5 *vs.* 40; $p = 1.0$) were reported for group 1 and group 2. Peroperative mortality was nil. No significant difference in terms of SSI between MBP and no-MBP groups were reported, also for the subset of patients receiving a stoma and for the subset of patients who underwent surgery with a minimally invasive approach (laparoscopic or robotic).

**Conclusions.** Preliminary data from this single-centre, randomized trial seem to suggest that omitting MBP before LAR is not associated with an increase in SSI, and a simple bowel enema could be enough for these patients. Registration number: NCT00940030.

## P10

### Endoluminal vacuum therapy of anastomotic leakage following low anterior resection

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**Background.** The most important surgical complication following rectal resection with anastomosis is symptomatic anastomotic leakage. The clinical leakage rate

after anterior resection varies from 2.8–20% and is associated with a 6–22% mortality rate. Endosponge is a minimally invasive method to threat anastomotic leak endoscopically accessible in the low rectal area.

**Methods.** We successfully treated 8 patients with an anastomotic leak following low anterior resection for rectal cancer with Endosponge. Endosponge consists in an open-pored sponge inserted into the cavity using a flexible endoscope. The sponge is then connected through an Y tube with a vacuum-assisted system (Redyrob Trans Plus® bottle). Thus, it is realized a continuous drainage of the secretion and the sponge cleans away the fibrin coatings, reduces in size and cleans the cavity. The sponge system is changed every 48 hours. The size of the new sponges applied during the treatment is reduced to fit the decreasing dimension of the cavity. When the cavity is approximately $1 \times 0.5$ cm large the Endosponge treatment is ended.

**Results.** In all 8 cases Endosponge was successful, relieving patients from infectious symptoms; the treatment was performed on an outpatient basis. The mean duration of therapy was 27 days, with an 8–15 sponge exchanges for patient. Mean healing time was 48 days. No intraoperative complications were recorded. We found three cases of mild anal pain successfully treated medically.

**Conclusions.** Endosponge seems an effective minimally invasive procedure to treat extraperitoneal anastomotic leakage without reintervention reducing morbidity and mortality among patients.

## P11

### Pelvic recurrence after surgery with total mesorectal excision (TME) for rectal cancer: Results in a consecutive series with a strict follow-up program

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**Background.** Local recurrence still remain a major problem after radical resection of rectum for cancer. It's unclear whether strict follow-up leading to early diagnosis of local recurrence could improve resectability and prognosis.

**Methods.** Between 1994 and 2009, 673 patients were treated with TME for rectal cancer. All these patients underwent a follow-up program comprising instrumental and clinical controls every 6 months for at least 5 years. With a median follow-up of 50 months (range 9–120 months), 59 local recurrences were diagnosed. In all but 4 patients recurrence was asymptomatic. Local recurrence rates registered were 6%, 8% and 10% respectively at 2, 3 and 5 years. 18 patients (35%) with distant recurrence at the same time were excluded from the following analysis, for a total of 41 patients examined with local recurrence only.

**Results.** Of the 41 patients 23 (56%) underwent surgery: Miles operation in 12 cases (29%), Hartmann procedure in 2 (5%), repeated low anterior resection in 4 cases (10%), and palliative procedure in 5 cases (12%). Eight patients (20%) were excluded from surgery and underwent some form of CT or RT-CT, whilst 10 patients (24%) were addressed to palliative treatment. Overall survival (OS) rates were 48%, 29% and 22% respectively at 2, 3 and 5 years. On univariate analysis, resection of recurrent disease was the only significant factor associated with prognosis, with a 5 years OS of 30% *vs.* 22% for resected and non resected cases ($p = 0.04$).

**Conclusions.** Despite early diagnosis of recurrence after TME for rectal cancer, only a half of patients are amenable for resection. This is relevant, since surgical resection still remain the mainstay of treatment for locally recurrent rectal cancer within a multidisciplinary context.

## P12

### Extrafascial dissection for carcinoma of the distal rectum – a prerequisite for increase sphincter-preserving operations

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**Background.** The tumors descending and engaging the extraperitoneal part of the rectum we consider as CDR. In these cases the procedure for radical resection is 3D dissection and our opinion is that tumors should be examined apart from the other colorectal carcinomas. The challenge in front of the surgeons is to combine the radical operation with preservation of the sphincters for a good postoperative quality of life.

**Objective.** Increase of survival without relapse of the disease and reduction of definitive stoma in the group of the operated patients with CDR.

**Methods.** 213 radical interventions for CDR (1996–2009). Most tumors are advanced – T3 are 52%, and T4 – 7%. Over half of the lesions are up to 4–5 cm above the ACV and 41 patients (22%) have metastases in the regional lymph nodes.

**Results.** SPO are 164 (77%): 60 low and ultra-low anterior resections, 81 proctectomies, 5 Hartmann resections and 18 intrasphincteric resections, 5 of them proctocolectomies. 78 SPO are with direct anastomoses, and 84 are with reconstructive anastomoses (2 Hartmann operations were not followed by restitution). The type of

SPO is defined mainly by the distance between the tumor and ACV. The abdominoperineal extirpations are 49–25 for CDR at the 3rd–5th cm from ACV and 24 for tumor lower then 3rd cm. The local recurrences are 17 (8%) – 6 for APE (12%) and 11 for SPO (6.7%). The 5 year surviving rate for 122 operated patients is 70%.

**Conclusions.** 3D dissection is necessary to achieve carcinoma clearance of the mesorectum, circumferential border and distal resection line for Ro resection and is essential condition for SPO. The radicalism is not defined by the type of the intervention but depends on the manner of operation. Despite of the fact that most tumors are advanced and below 5 cm from ACV, the anal function was preserved in 77% cases. This helps patients to achieve similar postoperative quality of life. Surviving and 6.7% local recurrence confirm that SPO do not compromise oncological principles.

## P13

## Indications for a protective stoma after a distal sphincter-preserving operation

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**Background.** The extended volume of the distal resection for SPO in the case of CDR justifies the usage of PIS. The duration of the working PIS depends on the period for continence restauration. The incontinence is temporal and expectable because it corresponds with the level of the resection of the proctium.

**Methods.** 33 (20%) from SPO has been finished with a PIS, mainly used by the cases of the ISR and as an exception by ARR. 15 out of 81 proctectomies, 17 out of 18 ISR and 1 out of 60 ARR, have been finished with a PIS. The influence of the operation mode on the frequency of the PIS can be statistically verified by an $\chi^2$-analysis.

**Results.** There were no leakages among the operations finished with a PIS. The level of notability sig $<0.05$ shows that the mode of the operation has an influence on the frequency of the PIS, which is 1.6% for the low and ultralow ARR, 18.5% for the proctectomies and 94% for the ISR. The time to restore the PIS depends on the operation mode. It is 35–40 days for the proctectomy, 60–70 days for the ISR and 3 months for the proctocolectomy. The time needed to achieve a sufficient control of the defecation is individual and is defined by the mode of the SPO and the way the anastomosis is made.

**Conclusions.** PIS successfully prevent the leakages. The indications for PIS are: ISR, imperfect congestion, tension between the ends of the anastomosis and disturbed blood supply. The personal experience and the good operative technique diminish the need for PIS. PIS is binding after a proctectomy, during which the inferior mesenteric artery has been cut off; reconstructive anastomosis, age over 70 years and if the surgeon has limited experience with transanal resections. The temporal PIS is suitable for patients with SPO as alternative to abdominalperineal extirpation. The closure of the PIS is technically easy without the need of a medial laparotomy and the procedure doesn't increase the operative risk.

## P14

## Intrasphincteric resections – an alternative to abdominoperineal extirpations for part of the carcinomas of the distal rectum

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**Background.** The ambition to impose the SPO in cases with tumors in the region of the anorectal junction demands the definition of the limit of the distal resection of the proctium, combining the clearance of the resection line with acceptable anal function. 1–2 cm distance from the tumor is enough for the intramural clearance and is a reason for ISR when the CDR is bordering AC.

**Objective.** The evaluation of the radicalism and the quality of life after ISR are to define the objectiveness of the procedure for CDR near to linea dentata.

**Methods.** Eighteen ISR were performed for CDR located 2–3 cm over the dental line. The fist anastomosis was a direct one and the others were reconstructive: 9 J-pouch, 6 coloplastics and 2 laterоterminal anastomoses. The protective ileostomas were done in 17 cases and the anal function is evaluated by Cleveland Clinic Incontinence Score.

**Results.** Patients are followed up from 7 to 1 year (mean period 2 years and 4 months) and one local recurrence was detected (5.5%). The functional outcome is defined by the severity of incontinence and the number of defecations – average 2.29 (1–4) per day. The incontinence is temporal and partial by the patients with ISR and stress defecations have 9 of them. The reconstructive anastomoses reduced the incidence of the incontinence and the effect is most seen in cases with J-pouch, less seen in laterоterminal anastomosis and is minimal for the coloplastics.

**Conclusions.** The volume of excision in the ISR includes the part of the AC with partial or entire removal of the inner anal sphincter. After procedure the residual anal pressure was reduced. The intact puborectal muscle allows the fast restoration of the maximal voluntary pressure in the AC, and even to exceed it by cases of stress-defecation. The temporal disturbance of the control can be overcome by reconstructive anastomoses, diet, medication and exercises. The ISR is an oncological sustained procedure for the tumors located 1–2 cm from the AC, proved by the low recurrence rate.

## P15

### How long distal margin is safe in poorly differentiated adenocarcinoma of rectum?

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**Background.** Distal rectal cancer is one of the challengeble diseases in colorectal surgery. Neoadjuvant chemoradiation before very low anterior resection is accepted instead of abdominoperineal resection.

**Methods.** Between 2007 and 2010, 74 cases of rectal cancer were operated in Shahid Faghihi Hospital percentages were suffering from distal rectal cancer, pathologic examination showed poorly differentiated adenocarcinoma with vascular, lymphatic and neural involvement and free distal margin were less than 2 cm in 4 patients. There were 3 men and 1 woman with mean age 56-year old. All of them received neoadjuvant chemoradiation, then very low anterior resection were done for them with diverting ileostomy for 3 months. Total Mesorectal Excision (TME) completely were done by one surgeon. After operation, 4 patients received chemotherapy again, the same as others.

**Results.** Unfortunately, after mean 16 months, in 2 patients rectal bleeding developed and in anoscopy recurrence of tumor near anastomotic line were detected. In one patient (female case) during routine follow up examination, recurrence of tumor was detected in anastomotic line after 14 months. The last patient was suffering from perineal pain; 21 months after operation and local recurrence was detected. Overall, they were suffering of local recurrence approximately 17 (mean) months after their cancer surgery.

**Conclusions.** We recommend to have more than 2 cm free distal margin in poorly differentiated type of tumor in order to decreasing recurrence rate.

## P16

### Neoadjuvant hypofractionated chemoradiotherapy with local hyperthermia and metronidazole for fixed or tethered T3/T4 rectal cancers

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**Background.** The aim of this trial was to evaluate the rate of pathologic complete response (pCR), radical (R0) resection and toxicity following neoadjuvant chemoradiation with capecitabine, oxaliplatin, local hyperthermia and metronidazole for locally advanced fixed or tethered T3/T4 rectal cancers in a prospective non-randomized phase II study.

**Methods.** From July 2006 to October 2010, 67 previously untreated patients were enrolled. Radiotherapy (RT) was administered 3 times a week to a dose of 40 Gy in 4 Gy fractions. Oral capecitabine 650 mg/m$^2$ bid was given on days 1–22 and intravenous oxaliplatin 50 mg/m$^2$ was administered on days 3, 10, 17. Local high-frequency hyperthermia was performed on days 8, 12, 15, 17. Metronidazole 10 g/m$^2$ was administered per rectum on days 12 and 17. All 67 patients underwent surgery within 6–8 weeks after chemoradiotherapy. The primary end point of this study was pCR. Secondary end points included R0 resection, acute and late toxicity.

**Results.** Most common toxic events were grade I–II and were observed in 27 (40.3%) patients. Grade III events included diarrhea – 13.4% ($n = 9$), vomiting – 3% ($n = 2$) and proctitis – 3% ($n = 2$). No grade IV events were observed. Three patients (4.5%) remained inoperable. All 64 (95.5%) patients with resected tumor had R0 resection. Eight patients had pCR (11.9%), 28 patients had a pathological response with minimal residual disease (41.8%).

**Conclusions.** Preliminary results show good tolerability and encouraging R0 resection and tumor regression rates of the investigated treatment scheme. Data on PFS and the local recurrence rate are being analysed.

## P17

### Laparoscopic total mesorectal excision; experience with 74 patients

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**Background.** Total mesorectal excision (TME) is the cornerstone of surgical treatment for extraperitoneal rectal cancer. The aim of the present study is to present our experience in 74 cases with laparoscopic TME.

**Methods.** A retrospective review of 74 cases of laparoscopic TME was performed between 2007 and 2010.

**Results.** Seventy-four patients with low and middle rectal cancer were treated with laparoscopic TME. 69 patients (93%) with advanced rectal cancer were treated preoperatively with neoadjuvant radiochemotherapy. Distal pathologic margin of all cases was more than 1 cm. Conversion rate was about 4% (3 cases). There were 17 post operative complications including post operative ileus (9 patients), urinary retension (5 patients) and wound infection (3 cases).

**Conclusions.** Our experience shows that laparoscopic TME is a safe and oncologically acceptable procedure. However, it remains a complex technique, requiring an adequate learning curve.

## P18

## Sphincter-saving surgery in consideration of lymphatic spread of rectal cancer

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**Background.** Despite of great importance of lymphatic spread of rectal cancer there have been very few researches to investigate detailed description of lymph nodes within the rectal mesentery.

**Methods.** Our research based on anatomic study of lymph nodes distribution of 59 specimens after total mesorectal excision (TME) in patients with upper and middle rectal cancer. After surgery pararectal fat was separated from rectal wall, divided in 3 parts and marked in accordance to parts of rectum: low, middle and upper parts. Lymph nodes were identified using fat-clearing solvent with following detailed pathological assessment.

**Results.** In 17% cases (10 of 59) were found distal metastatic lymphatic spread. Metastatic lymph nodes were found up to 4.0 cm distal lower end of rectal tumor.

**Conclusions.** Distal metastatic spread, as an important factor of local recurrence, should be always taken into account at the time of choice of type of sphincter-saving surgery for rectal cancer. And, if in case of upper rectal cancer anterior resection (AR) of rectum is the surgery of choice with partial mesorectum-excision 5.0 cm distal tumor end, in case of middle rectal cancer total mesorectal excision (TME) is obligatory. Abdomino-perineal resection (APR) or intersphincteric resection must be considered if other factors, as narrow pelvis, difficulty in mobilization and uncertainty in performance of clear TME, prevent surgeon from performing low AR.

## P19

## Laparoscopic total mesorectal excision for rectal tumor

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**Background.** Total mesorectal excisin (TME) is now considered a standard surgical approach to avoid local recurrence of rectal cancer, but a laparoscopic procedure for TME has not been established. Laparoscopic surgery does present some problems for large or invasive tumors in the pelvic cavity, but it enables more accurate visualization of the anatomical structure in the pelvic cavity for selected patients with tumors in the middle or lower rectum. For example, it seems to be somewhat superior to open surgery for small tumors.

**Methods.** Patients with a mid- or low-rectal tumor underwent laparoscopic TME by a single surgical team.

**Results.** From December 2007 to September 2010 we performed laparoscopic TME for 18 patients of 28 cases of laparoscopic colorectal surgery. Median age was 64.3 years, (range 30–78). Two cases underwent adominoperineal resection, 16 cases had low anterior resection (LAR). In two LAR cases a covering ileostomi was constructed. Mean tumor distance from the anal werge was 6 cm, mean tumor size 4 cm, mean operating time 135 min. There was no microscopic circumferential margin or microscopic distal margin involvement. Postoperatively in two cases developed anastomotic leakage. There was no port side recurrence.

**Conclusions.** Laparoscopic TME is a safe and accurate surgical procedure for selected middle or lower rectal tumors.

## P20

## Pelvic exenteration in advanced and recurrent rectal cancer

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**Background.** Adherence to adjacent intraabdominal organs or structures is encountered in 15% of patients with a colorectal cancer. Total pelvic exenteration is defined as the complete resection of the pelvic viscera and its draining lymphatic system. The objective of total pelvic exenteration is to encompass all malignant tissues including adjacent invaded viscera and regional lymphatics.

**Aim.** A review of a single institution experience with total pelvic exenteration for locally advanced rectal cancer.

**Methods.** Twenty-seven patients who underwent R0 pelvic exenteration were identified from database of total 1700 patients operated on for colorectal carcinoma at a single center. We performed resection of internal iliac vessels in 13 patients, sphincter saving operation in three patients. One stage pelvic exenteration and adrenalectomy in 1 patient, ileocecal resection or right hemicolectomy in 2 patients, small bowel resection in 2 patients and 1 patient underwent composite TPE. Liver resection of synchronous metastasis prior pelvic exenteration in 1 patient. Patients were followed-up according to standard protocol.

**Results.** The mortality was 7.4% (two patients died in postoperative course), average follow-up 21.6 months and the 3 year survival is 69%.

**Conclusions.** Our results confirm that in the case of invasion of rectal cancer to the adjacent pelvic organs or structures, pelvic exenteration offers the only chance of potentially curative treatment.

## P21

## Improvement of thermoradiochemotherapy for the squamosus-cell carcinoma of anal canal

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**Background.** The aim of this study was to improve sphincter preservation after combined chemoradiotherapy for squamous-cell anal carcinoma.

**Methods.** Between January 2003 and December 2010 34 patients underwent combined chemoradiotherapy for anal cancer at the department of proctology of N. N. Blokhin Cancer Research Center Radiotherapy (RT) was administered 5 times a week to a dose of 44 Gy in 2 Gy fractions. Intravenous cisplatin 20 mg/m$^2$ was administered on days 1, 3 weeks, intramuscular bleomycin 15 mg on days 2, 4, weeks 1–4. Local hyperthermia was performed on days 14, 16, 18, 20, 22 during 60 minutes with 42.5–43°C. Metronidazole 10 g/m$^2$ was administered per rectum on days 12 and 17. Second radiotherapy course was performed after 2 weeks with 21–24 Gy in 3 Gy fractions. Median follow-up was 46 months.

**Results.** Complete response (CR) was observed in 85% cases, abdomino-perineal resection performed in 15%. Local recurrences was 12.2%. Research proceeds.

**Conclusions.** Investigated treatment scheme shows encouraging CR rates and should be further investigated in comparison with standard treatment.

## P22

## Electric stimulation of anal sphincter as a treatment option for fecal incontinence after ultra-low coloanal anastomosis with or without intersphincteric resection

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**Background.** Progress in combined treatment makes possible sphincter saving treatment for patients with low rectal tumor. Many clinics report about good oncological outcome. But functional results after ultra low coloanal anastomosis (CAA) with or without intersphincteric resection (ISR) sometimes disappointing. The purpose of this study was to prospectively investigate patients with fecal incontinence after ultra low CAA with or without ISR and evaluate the efficacy of electrostimulation (ES) as a treatment option.

**Methods.** Thirty-six patients were treated for fecal incontinence. All patients had low rectal cancer and received preoperative chemoradiotherapy following by proctectomy with or without ISR with hand-sewn CAA. For electrostimulation we use Neurotrac ETS device in "incontinence" mode.

**Technics.** Bipolar probe introduced into anus. Each session lasts 20 minutes. Usually started with 20–30 mAh to maximal amplitude up to 80 mAh. Total number of sessions was 10. Patients were not specifically selected for treatment. Success was evaluated by anometry, water infusion test, Wexner scale.

**Results.** Mean squeeze pressure increased significantly after stimulation from 1.52 to 2.4. Mean score by Wexner scale increase from 8.3 to 16.6. Mean index according Wexner scale for hard and liquid stool and flatus incontinence increase from "1.14", "1.92" and "1.55" to "2.96", "3.59" and "3.44" respectively. Naturally, group without ISR showed better results.

**Conclusions.** Preliminary results for ES have shown that patients achieved higher maximum voluntary squeeze pressures, and showed a marked improvement in their continence. Given the advantage of ambulatory use the ES seems promising in terms of achieving improved fecal continence in selected patients.

## P23

## Intersphincteric resection for low rectal adenocarcinoma in presence of combined treatment program

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**Background.** Indication for intersphincteric resection (ISR) is non-fixed (T1, T2) low rectal tumor located within dentate line. Implementing of polyradiomodification program allows broadening indication for ISR to advanced stage (T3, T4) of low rectal cancer.

**Aim.** The aim of this study was to analyze oncological outcome after intersphincteric resection (ISR) for very low rectal adenocarcinoma in presence of polyradiomodification program.

**Methods.** Thirty-six patients with low rectal adenocarcinoma entered the trial. All patients had an infil-

trating adenocarcinoma, located between 2.5 and 4.5 cm (mean 3.6 cm) from the anal verge. 16 of them (44%) had invasion of internal sphincter as determinated by endosonography or MRI. Preoperative radiation therapy (RT) given in single fraction 4 Gy to a total dose 40 Gy. We use 2 radiomodifier – local Hyperthermia (HT) which add tumoricidal effects and electrone-accepting substance METRONIDAZOLE (MZ), which together with HT reinforce tumor radiosensitivity. HT (superhigh frequency, 460 MHz, exposure 60 min, temperature 43.5–44°C), given before irradiation. MZ (10 gr/m$^2$) in a form of hydrogel administrate intrarectaly, exposure 5 hrs. We use modified XELOX chemotherapy scheme: Capecitabine in daily dose of 2000 mg/m$^2$ + Oxaliplatin 50 mg/m$^2$ once a week.

**Results.** All patients received preoperative RT by abovementioned program and ISR with curative intention. No one has local recurrence or distant metastases – 2 years of observation.

**Conclusions.** Interspincteric resection in presence of polyradiomodification program appears to be oncologically adequate for very low-lying rectal tumours. This optimistic results evidence competence of sphincter-saving treatment for ultra low rectal rectal cancer.

## P24

## Lymphocytic infiltrate as predictor of microsatellite instability in colorectal cancer? First report from Serbia

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**Background.** Identification of microsatellite unstable (MSI-High and MSI-Low) colorectal cancers (CRCs) is important not only for the diagnostics of hereditary non-polyposis colorectal cancer syndrome but also because MSI-High CRCs have a better prognosis and may respond differently to 5-fluorouracil-based chemotherapy. In some studies the presence of lymphocytic infiltrates in tumor (TILs) indicated on microsatellite instability (MSI) of tumors.

**Methods.** One hundred and fifty-five primary colorectal carcinomas excised surgically at Clinic for digestive surgery, Clinical Centre of Serbia, Belgrade. TILs was determined independently by the pathologists without any knowledge of the microsatellite status. Tumors were classified as positive TILs if at least 5 lymphocytes were observed per 10 high-power fields. The microsatellite markers used in this study were BAT25, BAT26, NR-21, NR-22, NR-24. MSI analysis was carried out using a fluorescence-based pentaplex polymerase chain reaction (PCR) technique. We classified the tumors as MSI-High if two or more of the five markers showed MSI, and MSI-Low if only one marker showed MSI. Microsatellite stable tumors (MSS) were characterized by the absence of MSI in all 5 markers. Data were analyzed using the adequate statistical method.

**Results.** Of the 155 colorectal cancers, 19 (12.3%) were MSI High, 8 (5.2%) were MSI Low and 128 (82.6%) showed MSS. In 98 (63.2%) of all tumors, there was no TILs. TILs were often in group with MSI High tumors than MSI-Low and MSS, 53%, 37.5%, and 34.4% respectively, but with no statistical significance.

**Conclusions.** We could not conclude that lymphocitic infiltration predicts microsatellite unstable colorectal cancer in our cases.

## P25

## Intersphincteric resection or extirpation for low rectal cancer: functional and quality of life results of Specialized Oncology Hospital of Veliko Tarnovo

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**Background.** Up to date development of rectal surgery is related to possibility of avoiding permanent stoma formation, which is presumably believed as main quality of life (QoL) decreasing element. Sometimes low anastomoses result in poor bowel function. The aim of our assay was to analyze the present functional and QoL data of operated rectal cancer patients.

**Methods.** For the period 2005–2009 112 patients had been operated with low rectum neoplasm. The comparison is between group with intersphincteric resection (N1 = 59–52.7%) and primary extirpated patients (N2 = 53–47.3%). The quality of life data were assessed by EORTC questioners QLQ C30 and QLQ C38 preoperatively, in an early and late aspect. In 31 cases the technique of transverse colonic pouch was applied, modified with single layer suture. Bowel function was estimated regularly by a questionnaire.

**Results.** Extirpation techniques lead to significant preoperative QoL drop and a decent adaptation afterwards. Compared with the low resection technique a considerable improvement with time was observed, in particular at social functioning and general health status scales ($p < 0.05$). Despite some functional advances of patients with transverse coloplasty, the sphincter-spared group has high values of general and specific symptomology (pain, constipation, diarrhea, dyspnoea, financial difficulties, defecational problems and sexual dysfunction) generating low QoL.

**Conclusions.** Our data suggests lack of advantage evidence comparing low resection over extirpation methods. The group with low rectal resections often had to undergo multistage operative intervention with some specific complications. A very precise selection of patients is required.

## P26

### Up-front transanal mesorectal dissection: a procedure to improve the oncological safety of laparoscopic low anterior resection for rectal cancer

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**Background.** Laparoscopic low anterior resection for rectal cancers located within 3–4 cm from the anal verge is technically demanding in order to achieve both "adequate" total mesorectal excision and negative distal rectal margins. Transanal mesorectal dissection, as first step of the operation, seems to increase the oncological safety of the procedure.

**Methods.** From June 2009 to June 2010, 4 patients underwent transanal mesorectal dissection combined with laparoscopic low anterior resection and colo-anal anastomosis.

**Results.** There were 2 males with a mean age of 66.3 years. The mean distance from the anal verge to the rectal cancer was 3.7 cm. After the preoperative staging, 2 patients (T3N1, T3N0) had preoperative chemo-radiotherapy whereas 1 patient (T1N0) had up-front surgery. The remaining patient (T2N1M1, bilateral inguinal nodes) had 6-months systemic oxaliplatin-based chemotherapy followed by radiotherapy. The mean operation time was 300 minutes (68 minutes, the transanal procedure). In-hospital mortality was nil. At final pathology, resection margins were negative; the mean distance of the cancer from the rectal transection margin and from the radial margin were 12.5 mm and 13.5 mm, respectively. Pathologic stage was T1N2 in 2 patients, T1N0 in 1 patient, and T2N0 in the remaining. The 4 patients are actually alive without recurrence at 20, 16, 8, and 6 months respectively.

**Conclusions.** Up-front transanal mesorectal dissection is an easy and oncologically safe technique which allows wide longitudinal and radial resection margins in very low rectal cancers cT1–2 at the preoperative staging.

## P27

### Multimodal treatment of rectal cancer – evaluation of preoperative radiotheraphy

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**Background.** Colorectal cancer constitutes 10% of all malignant neoplasms and is second most common in Poland. The aim of the present study was to analyze the influence of preoperative radiotherapy on survival and local recurrence rate of the patients with rectal cancer, treated surgically in routine manner with postoperative chemotherapy.

**Methods.** One hundred and thirty-two patients were recruited in the study. They fall into two groups. Group I: 70 patients treated with preoperative radiotherapy, group II: 62 patients treated with surgery alone. The patients qualified to radiotherapy presented with stage B (39 patients) and stage C (31 patients). The patients were given 5 Gy each day for 5 days and underwent surgery. Postoperative pathomorphology showed following information: group I involved 39 patients (stage B) and 31 (stage C), whereas group II involved 34 and 28 patients. The patients with B and C stages were administered postoperative chemotherapy.

**Results.** Kaplan–Meier survival analysis was applied to each group according to: stage of tumour; lymph nodes involvement; stage of cancer; administration of radiotherapy; presence of local recurrencies. Results of analysis point to existing correlation between radiotherapy and five years survival rate ($p = 0.031$) and local recurrencies (stage B: $p = 0.1$; stage C: $p = 0.049$).

**Conclusions.** Preoperative radiotherapy in our study gives hope for the better prospects of the treatment of rectal carcinoma. Analysis of 5 years survival rate, localized recurrencies and long time complications confirms effectiveness and safety of preoperational radiotherapy in the treatment of rectal carcinoma in the stage B and C.

## P28

### TEM (Transanal Endoscopic Microsurgery) in rectal cancer – own experience

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**Background.** Operations of rectal lesions removing in the operating rectoscopy were introduced in Germany in

the mid 80's of the last century. Currently TEM operations have gained acceptance for T1 and T2 rectal cancers in G1 and G2 grading after neoadjuvant treatment. Our objective were to evaluate usefulness of TEM in the treatment of rectal cancer.

**Methods.** In 2008–2010 TEM surgery for cancer was applied for 29 patients from 35 to 85 years old (mean 64.7), 18 male (62%), 11 women (38%). Preoperative tests covered colonoscopy, abdominal CT and TRUS. All included patients had G1/G2 confirmation. As neoadjuvant therapy we used RTH 50 Gy + CTH 2×5 FU + LV over 5.5 weeks for 1 patient and 54 Gy + 2×5 FU + LV for 1 patient or 25 Gy/5 days for 5 patients. For TEM we used Storz equipment. Lesions were cut in full thickness rectal wall with at least 1 cm margin. Endoscopic biopsy control in 3 months after surgery was applied.

**Results.** Operation time averaged 84.8 min (40–170 min). The average distance of the tumor from anal verge was 5.1 cm (1 to 13 cm), mean lesion size 5 cm (1 to 10 cm). Stay after surgery averaged 4.2 days (2–8 days). There were no complications after treatment. One patient after long arm of RTH and 2 after short RTH had histologic eradication of cancer. So far there has been no relapse.

**Conclusions.** TEM for appropriately selected patients with rectal cancer performed by experienced surgeon is safe and effective sphincter-saving operation. All patients should be given with neoadjuvant treatment, which may lead to downsizing/downstaging or even eradicate cancer. Advantage of this treatment is much less postoperative trauma/complications and shorter postoperative hospital stay. To assess long term results we need further observations.

## P29

## Do we still need to preserve anal sphincter during surgery for ultra low rectal cancer?

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**Background.** Last decade the question of quality of life after surgery for very low rectal cancer is being discussed widely, especially focusing whenever preserve anal sphincters or not.

**Methods.** Since 2005 60 (31 male) patients with median age 54 (range 29–71) were operated for rectal cancer T2–3 within 1 cm from the dental line with partial anal sphincter preservation. Thirty-two patients received prolonged course of preop chemo-radiotherapy. Anorectal reconstruction with smooth muscle plasty and C-shaped colonic pouch was used in total number of procedures. All the patients were temporary defunctioned. Protective stomas were closured at 8–25 weeks after the primary surgery. 14 patients received a course of biofeedback (BFB) therapy before stoma closure. 42 patients were followed up more than 24 months after stoma closure. We used FIQL, SF-36 questionnaire before and 3, 6, 12, 24 months after stoma reversal as well as myography, vectrum volumetry and anal manometry at the same times.

**Results.** After a median follow-up of 38 months, local recurrence was determined in three (5%) cases. Gradual improvement of continence had being registered during 12 months after stoma closure and BFB-therapy made for earlier adaptation. We registered almost equal SF-36 (both Mental/Physical Components) results before stoma closure and 3 months later (44.2/38.1 and 45.4/36.8 respectively). With the course of time Mental Component was being improved faster than Physical one, and by 24 months after stoma closure they were 54.6 and 44.2 respectively.

**Conclusions.** Acceptable oncological and functional outcome of suggested surgery seems to be an attractive alternative to APR with permanent stoma for *high-motivated* patients.

## P30

## Late pelvic organ function after rectal cancer resection: a case-match study

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**Background.** There are still controversial data about the impact of rectal resection for malignancies on overall pelvic organ function and quality of life. We aimed to investigate whether these parameters differ compared to the general population without bowel resection.

**Methods.** Hundred and nineteen patients (42.5%) operated for rectal cancer at a single institution between 1995 and 2005 completed a self-administering questionnaire including the International Index of Erectile Function, Female Sexual Function Index, Short Form-12 Health Survey, International Prostatic Symptom Score, International Consultation on Incontinence Questionnaire-Short Form and Vaizey Incontinence Score. Healthy subjects with no bowel resection served as controls for each case and were matched by age (±5 years) and gender. The median follow up time was 7 years (range 2.8–14.2).

**Results.** The Vaizey incontinence score was significant higher in the patient group compared with the control group (patients: median 4 (range 0–24), controls: 0 (range 0–20); $p < 0.0001$). Sexual and urinary function showed no significant difference between both groups. In regard to the SF-12 health survey the median physical

health score of patients was 51.3 (range 22.0–58.2) compared to 53.6 (range 16.8–64.3) of the control subjects ($p = 0.1505$). The median mental health score of the patient group was 54.9 (range 19.1–63.8) compared to 54.8 (range 28.7–63.8) of the control group ($p = 0.2522$).

**Conclusions.** Patients with rectal cancer resection have a significant impairment of fecal continence. Notably, urinary and sexual function and quality of life are comparable with healthy subjects without colorectal resection.

## P31

## Management of locally recurrent rectal cancer

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**Background.** Surgery is the only curative treatment in patients with locally recurrent rectal cancer. Aim of this study was to review the role of surgery in the management of patients with rectal cancer recurrence.

**Methods.** We combined and evaluated data of patients presenting with recurrent rectal cancer between 1987 and 2005 from the prospective databases of three Italian centres. Data were analysed by means of Cox regression and Kaplan–Mayer survival analysis.

**Results.** One hundred and fifty patients (98 male), median age 60.4 (36–85) years presented with local recurrence after surgery for rectal cancer. One hundred (66.7%) patients fit surgery criteria and accepted to undergo surgery: 51 (51%) underwent radical and 49 (49%) extended resection. Carcinoembryonic antigen (CEA) was elevated in 41 (41%) patients. Twenty-four (24%) and 15 (15%) patients received pre- and post-surgical radiotherapy (RT) respectively, 24 (24%) received neo-adjuvant chemotherapy CT while IORT was carried-on in 2 (2%) and double-cycle CT in 7 (7%). Thirty-one (31%) patients experienced major post-operative complications. Tumour free resection margins (R0) were obtained in 61 patients (61%). Median overall survival was 37 months. Pre- ($p = 0.004$) and post-operative ($p = 0.04$) RT, stage ($p = 0.004$) and R0 resection ($p = 0.00001$) are significant predictors of survival.

**Conclusions.** Resection for recurrent rectal cancer results in good survival with acceptable morbidity. Patients undergoing surgery have improved overall survival compared with patients who refuse or do not fit surgery. Advanced stage of the primary tumor and lateral recurrence are associated with impairment of survival. Negative resection margin (R0) is the strongest predictor of survival.

## P32

## Malignant melanoma of the anus and rectum

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**Background.** There are approximately 300 cases of malignant anus-rectal melanoma written in the world literature. We described 17 cases of melanoma of the anus and rectum operated from us for 15 years. The localization of the neoplastical process is usually at the area of linea dentate. The patients complain of recto-hemorrhage and anal discomfort caused by foreign-body feeling or full-filling discomfort in the area. This formation considers like hemorrhoids frequently. The pain is not common symptom, but ulceration occurs in large percent. The metastasing is in the inguinal lymph nodes. The tumor color is between light-brown to red-purple in 50% of the cases. The coloring matter is absent in the other half of the cases and these tumors were consider like non-pigmentous melanomas.

**Methods.** (1) During the period of 15 years, between 1995 and 2010, in our clinical surgery experience we observed 17 cases of patients with malignant melanoma of the anus and rectum, which were 7 men and 6 women at the age between 57 and 72 years of old. (2) The recto-sygmoid endoscopic investigation of these patients discovers ulcerative sanguinitive by touch tumor mass of the anal-dermal tissue and in the anal duct within 10 patients, and in the distant rectum localization approximately on 2, 3 and 5 sm. of the ano-rectal borderline localization for the rest 3 patients. (3) The pre-endodoscopic biopsies gave histological evidence for the presence of atypical pleomorhious nuclear cells gathered as likely as the malignant melanoma cells. (4) Achromatical specimens, improved by the histological result, was observed in three of the patients, and in one of them the localization was in the distal rectum. In the rest two patients the localization was in the anal canal.

**Results.** (1) Within all patients was made an abdominal-perineal resection of the rectum a.m. Miles. (2) The post operative period was free of complications and the patients left the hospital in 10–14 days after the surgical intervention. (3) The patients were reexamined and were explored after 18 to 66 months. The survival period of the patients with achromatic variants was defined between 18 and 30 months, for the rest 14 patients the survival period was around 36 and 66 months (in one patient).

**Conclusions.** (1) Malignant melanoma of the anus is rare malignant neoplastic disease wich often affects the anus and distal rectum with aggressive local growth and early local and distant metastatic development in the re-

gional lymph nodes and in the hepar. (2) Current studies shows that both sex suffer almost equally, but more often the patients over 60 years of old are the one who develop the disease the most. (3) For instance the early discovery and exact diagnosis in these patients does not significantly change the survival period because of the early stage of system dissemination. (4) The differential diagnosis of this aggressive tumor, and it should be well known, includes rectohemorrhagia, which also may be caused by hemorrhoidal disease or rectal adenocarcinoma. (5) There is still no standard equivalent chemical- and radio-therapy in patients with metastatic melanoma disease on rectum and anus. (6) The combination of Interferon (INF-$\alpha$) and Interleukin-2 (IL2) and cytostatic medicaments named "biochemical therapy" or "chemical immunotherapy" is still on its explorative stage of discovery without sure evidence for distant effect. Despite the complex treatment – surgical, chemotherapy etc. – the prognosis is at large poor.

## P33

## Preoperative chemoradiotherapy for low rectal cancer: a deep thought must be given to its routine use

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**Background.** In the treatment of low rectal cancer, preoperative chemoradiotherapy (CRT) is regarded as a standard therapy. Even though the technique has evolved, radiotherapy can still lead to some drastic complications. Therefore, a careful selection of the patients for such a toxic therapy is mandatory. We were to identify which patients are truly apt for preoperative CRT in the treatment of low rectal cancer.

**Methods.** From 2000 to 2008, 187 patients underwent abdominoperineal resection in Ajou University Hospital. Typically, TME and extrasphincteric resection were performed. Sixty-seven with stage IV or undergoing preoperative CRT were excluded. For remaining 120 patients, survivals, local recurrences (LR), and prognostic factors were analyzed. Mean age was 59.8 (31–81). Average height of tumor was 1.8 cm (0–4.5). Mean follow-up time was 49.5 months (24–127). Postoperatively, patients with IIIB or positive circumferential margins ($n = 48$) underwent 5-FU-based chemotherapy plus 50.4 Gy irradiation was given.

**Results.** LR was 11.7%. A 5-year, DFS was 62.4% and 5-year OS was 84.3%. In univariate analysis, lymph node metastases ($p = 0.000$), and tumor depth ($p = 0.001$) were significant for LR and survival. In multivariate analysis, lymph node metastases were the only significant prognostic factor for both LR and survival. When comparing the patients by lymph node metastases, positive group ($n = 71$) showed 20.9% of LR, 58% of OS, 40.4% of DFS. However, we found 0% of LR, 97.8% of OS, and 93.0% of DFS in negative group ($n = 49$).

**Conclusions.** We found recurrence-free status in low rectal cancer patients without lymph node metastasis when adequate abdminoperineal resection was performed. Therefore, when we decide the preoperative CRT for low rectal cancer, lymph node metastasis should be predicted more accurately to avoid unnecessary irradiation.

## P34

## Ileal interposition after low anterior resection: It is a good bridge when the neorectum should reach the pelvic floor

**S. Y. Hong, K. W. Suh**

Department of Surgery, Ajou University Hospital, Suwon, Korea

**Background.** Restoration of the colonic continuity is an important issue in treatment of rectal cancer. We have used an ileal interposition (I–I) when the patient's anatomy showed short left or sigmoid colon. This study is to report feasibility of I–I and to compare functional outcomes with patients undergoing conventional low anterior resection (LAR).

**Methods.** Among 432 patients with mid and low rectal cancer, 32 underwent I–I between August 2002 and December 2008 in Ajou University Hospital. Detailed surgical procedures, operating time, pathology and long term outcomes were analysed. Median follow-up duration was 26 months (18–96 months). Male/female ratio was 30:2 and mean age was 70.6 years (65–78). Mean height of the rectal cancer was 6.6 cm (3–12) and mean distal margin was 1.9 cm (1.0–2.2). 60 patients with similar cancer undergoing LAR were chosen as a control. Two groups were compared with regard to operation time, complications, and functional outcomes.

**Results.** In average, 35 minutes were required for completion of the whole procedure of I–I. There was no intraoperative or postoperative complication. There was no anastomosis-related complications. Cleveland clinic incontinence score was measured. Anal function tests were performed 6 and 12 months postoperatively. In terms of anal functions, there was no statistical difference between I–I group and LRA group. However, noerectal capacity of 6 month after operation was significantly lower in I–I groups ($p < 0.05$). The neorectal capacity becomes similar to LAR groups 12 months later.

**Conclusions.** We found an I–I can be one of the good options when the neorectum should reach the pelvic floor. With additional 30 minutes, and even with a low midline incision, a well perfused, good functioning neorectum can be obtained.

## P35

### Effect of combined neoadjuvant treatment on long-term results of sphincter-sparing surgery for rectal cancer

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**Background.** The aim of the study was to investigate local recurrence rate (LRR) and disease-free survival rate (DFS) after surgical and combined treatment of rectal cancer with sphincter preservation.

**Methods.** This retrospective trial included 2 groups of patients with rectal cancer Dukes' stage B and C, who underwent sphincter-sparing surgery at the department of proctology of N. N. Blokhin Cancer Research Center between September 1986 and December 2006. Group A had surgical-only treatment and group B had preoperative hypofractionated radiotherapy (SCPRT; five fractions each of 5 Gy) with or without local hyperthermia (during 60 min at 42.5–43°C) on days 3–5 before elective surgery. Surgery was carried out within 72 hours after radiotherapy cessation. Median follow-up was 87 months.

**Results.** Four hundred fifty-two patients were included in the study, 224 in group A and 228 in group B. Demographic characteristics, tumor stage, type of surgical procedure and type of anastomosis did not significantly differ between the two groups. LRR was $18.1 \pm 2.6\%$ in group A and $8.6 \pm 1.4\%$ in group B ($p < 0.05$). Distant failures rate was $25.7 \pm 3.4\%$ in group A and $23.6 \pm 3.2\%$ in group B ($p > 0.05$). Patients in group B had significantly higher DFS – $69.7 \pm 3.8\%$ *vs.* $57.1 \pm 3.8\%$ ($p = 0.002$).

**Conclusions.** Sphincter-sparing surgery for rectal cancer is safe and feasible and should be carried out after combined neoadjuvant combined treatment in order to minimize local recurrence rate.

# Metastatic Disease

## P36

### Our experience in treatment rectal cancer patients with synchronous metastases

**Y. A. Barsukov[1], V. A. Aliev[1], S. I. Tkachev[2], S. A. Tyulyandin[3], M. Y. Fedyanin[3], D. V. Kuzmichev[1], Z. Z. Mammadli[1], A. O. Atroshenko[1]**

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**Background.** One million new cases of colorectal cancers are registered in the world each year. The disease is diagnosed at stage IV in 20% of patients, and 90% of these patients have unresectable metastases.

**Methods.** We showed that the resection of the primary tumor in patients with metastases increases survival rates. Post-operative chemotherapy (XELOX, FOLFIRI, FOLFOX, CAPIRI) increases a 2-year overall survival to $52.7 \pm 13.4\%$. Currently in Europe there is a tendency for the only conservative treatment in patients with metastatic rectal cancer. It is reasonable to combine neoadjuvant chemotherapy and radiotherapy in patient with rectal cancer with synchronous distant metastases in the most "favorable" groups (with the solitary and isolated liver metastases). The choice of preoperative chemoradiotherapy program was determined by extention of the primary tumor. All patients were treated by 3 courses of chemotherapy (FOLFOX6 or XELOX). The first course was administered with radiotherapy. In 19 of 29 (65.5%) patients with stage T2-3NxM1 we performed 3 cycles of FOLFOX6 and radiotherapy consisted of 25 Gy delivered over the period 5 days with two radiomodicators: Local microwave hyperthermia + Introduction of the polymer composition containing metronidazole 10 mg/m$^2$ (per rectum, RF Patent No. 2234318, 2004). The remaining 10 patients with stage T4NxM1 received 3 cycles of XELOX and radiotherapy consisted of 36–40 Gy – 4 Gy three times a week with radiomodicators. From 2007 to 2010 in our department 29 patients with rectal cancer with solitary liver metastases were treated. In 11 (37.9%) patients we revealed metastases in one lobe of liver, in 8 (27.5%) – in both lobes. Lung metastases were detected in 6 (20.6%) patients in the ovaries – in 2 (6.8%), liver and lungs – in 2 patients.

**Results.** We did not observe severe toxicity requiring withdrawal of chemotherapy. Reduce the dose of chemotherapy was needed in one patient. 25 patients underwent surgery, 1 – died before surgery (acute heart insufficiency). Abdominoperineal excision of the rectum is made in 8 of 25 (32%) patients. Sphincter preserve surgery was performed in16 patients (64%), 1 – sigmoidostomy. Cytoreductive surgery (R0) were performed in 9 (36%) patients, including 5 with simultaneous operation on liver. From 3 patients with multiple liver metastases only 1 patient died after surgery due to disease progression in 1-year follow-up. 3 patients after R0 resections are observed from 1 to 3 years without treatment. The remaining patients continue to receive chemotherapy. Median survival has not been reached. One-year survival is 51.7% (15 patients).

**Conclusions.** We started the program of neoadjuvant chemoradiotherapy in patient with metastatic rectal cancer. Preliminary data indicate the acceptable toxicity profile of therapy. Long-term results are expected and will be published later.

## P37

### Metachronous metastases from rectum adenocarcinoma in cervical lymph nodes after preoperative neoadjuvant chemoradiotherapy

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**Background.** Cases of metastatic damage of cervical lymph nodes from rectal adenocarcinoma are rare. According to the literature the frequency does not exceed 0.1%. For the primary tumor, these metastases are considered as distant.

**Methods.** A 63-year old woman underwent neoadjuvant treatment for rectal adenocarcinoma $T_3N_2M_0$ (radiation therapy 5 Gy for 5 days, chemotherapy: Xeloda $-1.5\,g/m^2$ each days of the radiation therapy and intarectal exposition of polymer composite mixture with metronidazole – 18 g in 3rd, 5th days of the radiation therapy). Three weeks later after noadjuvant therapy CT, colonoscopy and ultra sound diagnostic control showed a good effect from the tumor (reduction of the length, volume of the tumor and there were no evidence for distance metastasis). The patient was operated on in the volume of rectal resection. There were no adjuvant treatment after surgery. Four years later, during planning control examination was reviled the metastatic damage of the left side neck lymph nodes (hystolgycally and immunohistochemically – metastasis of the rectal adenocarcinoma).

**Results.** Fascial-fat surgery resection of left side groups lymph nodes was performed, and "XELOX" regimen of chemotherapy was appointed.

**Conclusion.** The program of neoadjuvant chemoradiotherapy helps to achieve a good local control after surgery and help to minimize the number of local recurrences, but the issue of management of the distant metastases remains relevant.

## P38

### Our experience in treating patients with synchronous distant metastases of rectal cancer

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Russian Cancer Research Center, Moscow, Russian Federation

One million new cases of colorectal cancers are registered in the world each year. The disease is diagnosed at stage IV in 20% of patients, and 90% of these patients have unresectable metastases. We showed that the resection of the primary tumor in patients with metastases increases survival rates. Post-operative chemotherapy (XELOX, FOLFIRI, FOLFOX, CAPIRI) increases a 2-year overall survival to $52.7 \pm 13.4\%$. Currently in Europe there is a tendency for the only conservative treatment in patients with metastatic rectal cancer. It is reasonable to combine neoadjuvant chemotherapy and radiotherapy in patient with rectal cancer with synchronous distant metastases in the most "favorable" groups (with the solitary and isolated liver metastases).

The choice of preoperative chemoradiotherapy program was determined by extention of the primary tumor. All patients were treated by 3 courses of chemotherapy (FOLFOX6 or XELOX). The first course was administered with radiotherapy.

In 19 of 29 (65.5%) patients with stage T2-3NxM1 we performed 3 cycles of FOLFOX6 and radiotherapy consisted of 25 Gy delivered over the period 5 days with two radiomodicators: Local microwave hyperthermia + Introduction of the polymer composition containing metronidazole $10\,mg/m^2$ (per rectum, RF Patent No. 2234318, 2004). The remaining 10 patients with stage T4NxM1 received 3 cycles of XELOX and radiotherapy consisted of 36–40 Gy – 4 Gy three times a week with radiomodicators.

From 2007 to 2010 in our department 29 patients with rectal cancer with solitary liver metastases were treated. In 11 (37.9%) patients we revealed metastases in one lobe of liver, in 8 (27.5%) – in both lobes. Lung metastases were detected in 6 (20.6%) patients in the ovaries – in 2 (6.8%), liver and lungs – in 2 patients.

We did not observe severe toxicity requiring withdrawal of chemotherapy. Reduce the dose of chemotherapy was needed in one patient. Twenty-five patients underwent surgery, 1 – died before surgery (acute heart insufficiency). Abdominoperineal excision of the rectum is made in 8 of 25 (32%) patients. Sphincter preserve surgery was performed in 16 patients (64%), 1 – sigmoidostomy. Cytoreductive surgery (R0) were performed in 9 (36%) patients, including 5 with simultaneous operation on liver. From 3 patients with multiple liver metastases only 1 patient died after surgery due to disease progression in 1-year follow-up. Three patients after R0 resections are observed from 1 to 3 years without treatment. The remaining patients continue to receive chemotherapy. Median survival has not been reached. One-year survival is 51.7% (15 patients).

We started the program of neoadjuvant chemoradiotherapy in patient with metastatic rectal cancer. Preliminary data indicate the acceptable toxicity profile of therapy. Long-term results are expected and will be published later.

## P39

### Radiofrequent ablational treatment of colorectal metastases in liver

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**Background.** It is well known that around 50% of colorectal cancer patient will develop liver metastases at some course of their disease. Radiofrequent ablational treatment (RAT) is the procedure of destroying metastases in liver by using radiofrequent energy. It could be used either in combination with liver resection or as separate modality.

**Methods.** We have treated 63 patients in the period from May 2004 to December 2010 at the Institute of oncology and radiology of Serbia. RAT has been used as open primary procedure in the same act with colorectal cancer resection or as secondary operation of liver metastases. All patients had multiple hepatic metastases that were not suitable for liver resection. All patients were preoperatively completely evevaluated by clinical exam, CT, NMR; ultrasonography (US) and intraoperative US.

**Results.** All patients were operated at the Institute of Oncology and Radiology of Serbia after treatment consensus has been reached by multidisciplinary committee. Out of 63 treated patients, in 27 primary RAT procedures have been performed in the same act with liver resection. In 36 patients RAT procedure has been done as secondary surgical treatment of liver metastases. We did not have intraoperative or immediate postoperative mortality. Three year survival was 29%.

**Conclusion.** Radiofrequent ablational procedure is the treatment of choice for patients with multiple liver metastases due to colorectal cancer that are not suitable for liver resection. After ablation of metastases has been done patients need to continue the treatment with adjuvant chemotherapy. These patients fall into high risk group of oncology patients and intensive postoperative monitoring with hydration and close follow up of liver and kidney function is mandatory.

## P40

### Practical experience with Kras mutation testing in Metastasized Colorectal Cancer (mCRC)

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Colorectal carcinoma is one of the most frequent malignant neoplasias in Central Europe. New therapeutic procedures which taken together aim for the containment of metastasized colorectal cancer (mCRC) can improve the course of disease using an EGFR-targeted therapy for a selected patient collective. KRAS plays a key role in the EGFR-signal transduction pathway regulating cellular growth and also oncogenesis of colorectal carcinoma.

The KRAS-gene harbouring an activating mutation leads to the expression of a constitutively activated KRAS-protein. Therefore, patients with an activating mutation in the KRAS-gene cannot benefit from an anti-EGFR therapy. These mutations are present in about 40% of CRC. According to EMA identifying patients with "wild-type" (i.e. non-mutated) KRAS-gene is prerequisite for administration of anti-EGFR therapy.

Clinical referral for KRAS testing, selection of representative tissue samples, documentation, standardized methods of mutation analysis and the integration in the pathologist's report enable the oncological team to establish an individualized therapeutic concept for the patient.

In the observation period of more than two years 639 tests have been performed in our institute. Serving as a reference institute of the ÖGP (Austrian Society of Pathology) for KRAS testing tumour samples from our hospital as well as from several other Austrian hospitals were analyzed. In 263 cases (41%) the tumors were found to be KRAS-mutation positive whereas 376 cases (59%) contained a wild-type KRAS and therefore were eligible for a therapy with antibodies against EGFR.

Presented will be clinical and diagnostic criteria and results together with the performance in national and international quality assessment trials. In addition integration of analysis-data into an Austrian KRAS registry will be introduced.

## P41

### Individualization of adjuvant chemotherapy (AChT) in treatment of the colorectal cancer (CRC) with liver metastases

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National Cancer Institute, Kiev, Ukraine

**Background.** To improve the survival for colorectal liver metastasis, surgery may be combined with AChT. The purpose of the study was individualized AChT according to molecular tests and expression of apoptosis-related markers.

**Methods.** The data of the experience of combined treatment of 83 CRC patients with synchronous liver metastases is presented. According to expression of

intratumoral thymidylate synthase (TS), excision cross-complementing gene (ERCC1), polymorphism of uridin-diphosphat-glucuronozil-transpherase (UGT1A1) and proliferate tumor status, AChT were used: group 1A – FOLFIRI/FOLFOX (20), group 2A – 5-FU/LV (17). Control group: 1 – FOLFIRI/FOLFOX (19), group 2 – 5-FU/LV (27). All patients received 8 courses AChT. CDNA was derived from paraffin-embedded tumor specimens to determine TS and ERCC1 mRNA expression relative to the internal reference gene beta-actin using fluorescence-based, real-time reverse transcriptase polymerase chain reaction.

**Results.** Eighty-three resections for CRC with liver metastases performed from 2005 to 2008 (91% $\geq$2 segments) were reviewed. In all cases R0 resection of the colon cancer and liver metastases were made. Postoperative complication rate was 14%. Median survival rate not found in 1A study group; group 1–36 month, group 2A – 28 month, group 2–15 month. Three-years survival rate were $94.3 \pm 7.1\%$; $81.3 \pm 7.8\%$; $43.3 \pm 8.4\%$; $13.3 \pm 6.9\%$ respectively in group 1A, 1, 2A, and 2.

**Conclusions.** It is possible to personalize the adjuvant treatment and improve survival rate of the CRC patients with liver metastases using the molecular tests.

## P42

## Liver resections in colorectal metastases – our experience

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**Background.** The surgical intervention is the only opportunity for curative treatment in long term manner in patients with liver mets from colorectal cancer and in combination with the multimodal approach increase the 5 year survival rate to 30–40%.

**Methods.** We report and evaluate the patients, underwent liver resection by colorectal liver metastases in 1st Clinic of Surgery, University Hospital "St. Marina", Varna, Bulgaria, for the period of 2008–2010. We have adopted the ESMO-standards for multimodal approach in patients with IV Stage colorectal cancer.

**Results.** We have operated 32 patients. Radical liver resection with R-0 resection margins were obtained to all of them. Major hepatic surgery were undertaken in 12 patients – right hepatectomy in 3 patients, extended right hepatectomy in 2 patients, left hepatectomy in 3 patients, and three segmentectomy in 4 patients. In 8 patients an atypical liver resection was done. We faced local complications as: ascites in 5 patients, temporary suspended liver function, and thrombosis of portal vein in one patient. General complications were observed as followed: in 1 patient – pneumotorax, in 3 patients symptomatic pleural edema. We didn't observe any perioperative mortality. The survival rate were followed for a period from 3 to 18 months, all the patients were evaluated by PET-CT. We found progression in 2 patients, who underwent re-resection.

**Conclusions.** It is very important to be strictly followed the accepted standards for treatment. The presence of PET CT is a must for adequate surveillance of patients with colorectal cancer.

## P43

## Selective Pringle maneuver at resection of liver metastases

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Institute for Oncology and Radiology in Belgrade, Serbia

**Background.** Selective Pringle maneuver involves temporary occlusion of Portal vein and proper hepatic artery lobar branch. Lobar branch occlusion is performed with a lobe in which resection is performed. In the other lobe normal circulation is present.

**Methods.** The procedure involves dissection of hepatoduodenal ligament, elements preparation, and separation of Portal vein and proper hepatic artery lobar branches. Compared to nonselective occlusion maneuver there is no obstruction of bile duct. Occlusion is performed after the deliberization of liver ligaments, before the initiation of planned resection. If the procedure is performed correctly, Cantle's line, which is a surgical border between left and right lobe, can be visible. After that anatomic or extraanatomic liver resection is performed with CUSA.

**Results.** With 14 patients the aforementioned selective occlusion was performed. With 11 patients the metastases were in the right lobe and in 3 patients in the left one. With 5 patients one segment resection was performed, with 3 patients resection of two segments performed, and in the other resection of metastases was performed. The number of metastases ranged from 1 to 4. Plan for resection is based on angioCT report which shows the relationship between liver vascular elements and metastases. Plan for resection is also made based on intraoperative ultra sound.

**Conclusions.** Selective Pringle extends the time of occlusion and by that makes resection easier. This process enables normal blood circulation in one of the lobes. Central portal vein pressure is lower and by that there is lower intestinal venous congestion. Maneuver requires careful preparation of hepatoduodenal ligament elements, as well as a trained surgical team.

## P44

### Surgical treatment of colorectal liver metastasis after neoadjuvant chemotherapy

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**Background.** Applying neoadjuvant chemotherapy in patients with colorectal cancer liver metastases, which are primarily nonresectable or potentially resectable, it is possible to transform in resectable state. The goal of treatment is R0 liver resection and putting the patient in the NED stage of disease.

**Methods.** All patients received protocol for potentially resectable metastase – FOLFOX-Bevacizumab. The assessment was conducted on the basis of angioCT and NMR. With all patients liver resection procedures and RFA were applied.

**Results.** During the period from June 2007 to December 2009 in 17 patients with nonresectable or potentially resectable metastases the neoadjuvant HT FOLFOX-Bevacizumab was applied on average for three months. The patients were operated 6 weeks after the last application of Bevacizumab, because of the possibility of intraoperative bleeding. The number of metastases ranged from 1 to 6. With 4 patients lobar resection was performed, and with 5 patients segmental resection was performed. With another 6 patients metastasectomy was performed, while RFA was performed with 2 patients.

**Conclusions.** By applying neoadjuvant HT and Bevacizumab with patients suffering from colorectal cancer liver metastases as the only existing metastases, it is possible to significantly reduce metastases, and thereby resection as well. With this approach time without disease and survival are increased.

# Surgical Techniques

## P45

### New technologies in surgery of the large intestine

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**Background.** To study possibility of formation compressive anastomosis of large intestine with using the titanium nickelide implants as alternative to traditional manual and mechanical anastomoses: to define indications for using of this equipment.

**Methods.** Eighty-six patients were operated on. Forty-nine patients were hospitalized in urgent order. Thirty-seven patients were hospitalized routinely. The disease of the urgent patients was mostly complicated by the acute bowel obstruction (classification by Topuzov, 1984). The average age of operated patients was $59 \pm 1.8$ years.

**Results.** The tumors were localized in cecum (6 cases), ascending colon (10 cases), right flexure of colon (4 cases), transverse colon (6 cases), left flexure (12 cases), descended colon (23 cases), sigmoid colon (25 cases). Indications to formation of compressive colon anastomoses at routine operations were appropriate preparation of intestines and absence of severe somatic diseases. At acute bowel obstructions in compensation and decompensation phase (Topuzov, 1984) the formation of anastomosis were combined with preventive decompression of proximal parts of intestines by imposition of double-tube transversostomy and cecostomy. The stomas were not done at imposition of ileocoloanastomoses in subcompensation phase. At decompensated bowel obstruction combined with peritonitis an severe cardiopulmonary diseases operation were completed by imposition of stoma. Postoperative complication were seen at 10 patients (11.62%). Intra-abdominal complication were at 4 patients (4.65%). Not abdominal character complications were seen at 6 patients (6.97%).

**Conclusions.** Formation compressive colon anastomoses using TiNi can be used as alternative to traditional methods of anastomosing in urgent and routine surgery.

## P46

### Method of surgical rehabilitation in patients with convectional ileostomy

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**Background.** Develop in an experiment is technically simple and safe way to formation continent reservoir, involves the creation of a pouch from the patient's loops of the ileum or small intestine. To explore the possibility of formation of continent reservoir with using of the medical materials from NiTi (titanium nickelide).

**Methods.** The technique developed in the experiment on 19 mongrel dogs. Performed the formation of continent reservoir developed by us method. The method consists in the formation elastic retention flap with a porous NiTi plate in the distal segment of the ileum or small intestine and also formation continent intestinal reservoir through the formation of compressive anastomosis be-

tween the intestinal loops, above the elastic retention flap using two wire linear NiTi implants with "memory" shape (RU 2375973).

**Results.** Histological studies confirm that the conditions of uniform compression in the regeneration of the enteric anastomosis differs weak inflammatory reaction, absence ligature channels, adequate comparison of the layers of intestinal wall. It contributes to early relief of the inflammatory reaction and formation of mucous membrane at the 14th day after surgery. Structural analysis of the porous NiTi implant in the optical microscope revealed that it integrates well with the surrounding tissues. Rejection of the wire linear NiTi implants from the anastomosis zone had occurred after an average of $6.7 \pm 0.36$ days.

**Conclusions.** The results of measuring the mechanical strength of compressive enteric anastomosis have shown advantages over manual anastomosis.

## P47

## Short-term results of cytoreductive laparoscopic operations for patients with metastatic colorectal carcinoma

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**Aim.** To determine the role of cytoreductive laparoscopic surgery in combined treatment for patients with synchronous metastatic colorectal carcinoma.

**Methods.** The cytoreductive operations in the volume of the primary tumor removal (even in patients with synchronous multiple metastases in the liver and/or other organs) allows to increase two-year survival by 3.9 times up to 18.2% in comparison with symptomatic operations – 4.7% (colostomy or bypass). Adjuvant chemotherapy after cytoreductive surgery may improve the results of a two-year survival after combined treatment up to 52.7%. The laparoscopic precision technique may minimize the surgical trauma for patients with synchronous metastatic colorectal cancer. It could help to optimize treatment strategy (to estimate the spreading of tumor during diagnostic laparoscopy, to determine the treatment strategy) and to expand the indications for cytoreductive operations, especially in patients burdened with co morbidity. During 2010 in Russian Cancer Research Center at the Department of Oncoproctology 20 laparoscopic operations in patients with synchronous metastases from colorectal carcinoma and with different comorbidities at the age of 63–79 were performed. The depth of invasion of primary tumor $T_3$ were registered in 15 (75%) patients; $T_4$ – 5 (25%). Metastases in one organ ($M_{1a}$) were diagnosed in 13 (65%) patients, two or more organs ($M_{1b}$) – 7 (35%) patients. Histological examination by the removal organs showed that the metastases to the regional lymph nodes were detected in 10 (50%) patients: $N_1$ – 8; $N_2$ – in 2 patients. Laparoscopic cytoreductive resection of various volumes with the removal of the primary tumor and primary anastomosis were performed among thirteen patients and seven patients underwent the symptomatic operations by laparoscopic access. Also, in one case simultaneous atypical liver resection was performed. Diagnostic laparoscopy revealed a total carcinomatosis in three patients. It was the reason for conversion to laparotomy access in one patient for bypass; two patients laparoscopic colostomy was performed. Totally laparoscopic access was applied in 17 (85%) patients, video-assisted – in 3 (15%). The volume of laparoscopic operations was: right hemicolectomy – 3 (15%), left hemicolectomy – 2 (10%), sigmoid colectomy – 6 (30%), low rectal resection – 1 (5%), low anterior resection with sigma – anal anastomosis (LAR-SAA) – 1 (5%). Symptomatic colostomy underwent – 6 (30%) patients, bypass – 1 (5%). The anastomoses were formed in 13 (65%) patients: stapled anastomoses "end to end" – 9 (45%); hand-assisted anastomoses "side to side" – 3 (15%), sigma-anal anastomosis – 1 (5%). The leakage was noted only in one case (5%) – stapled anastomosis after low rectal resection. In one case (5%) – the suppuration of minilaparotomy wound was admitted. All patients were activated on 2nd day. The laxation was restored on 2nd day, first food taken – on 3rd day, the bowel movement – on 2–3 day. Postoperative analgesia was 1–3 days. The average hospital stay in the clinic were 10.3 days.

**Results.** Laparoscopic operations have the same efficacy in comparison with open surgery.

**Conclusions.** Laparoscopic precision technique in the volume of cytoreductive operations may be included in combined treatment program for patients with synchronous metastases of colorectal carcinoma. It could helps to optimize treatment strategy (to estimate the spreading of the tumor during diagnostic laparoscopy, to determine the treatment strategy) and to expand the indications for cytoreductive operations, especially in patients, burdened with co morbidity.

## P48

## Laparoscopic colectomy and restorative proctocolectomy without ileostomy for familial adenomatous polyposis (FAP), Single center experience

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**Background.** Familial adenomatous polyposis (FAP) is a dominantly inherited syndrome. Risk of cancer begins to increase after age 20 years if not treated. The purpose of this study was to evaluate the feasibility and outcomes after laparoscopic prophylactic surgery for FAP.

**Methods.** A retrospective review of patients with FAP that laparoscopic proctocolectomy (TPC)/ileal pouch-anal anastomosis IPAA without ileostomy was done for them were included in this study.

**Results.** Sixteen patients were detected, 10 male and 6 female, mean age was 25, there were 4 post operative complications, 1 intra-abdomoinal collection, 1 wound infection and 2 ileus. No leakage was detected.

**Conclusions.** Laparoscopic prophylactic treatment of FAP appears to be safe and feasible and may be an appealing alternative to open surgery.

## P49

### Anatomical distribution of colorectal cancer in Western provinces of Iran

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**Background.** Colorectal carcinoma (CRC) is one of the common diseases of industrial countries. This study aimed to determine the anatomical distribution of colorectal cancer (CRC) over a six year period in the Taleghani Hospital in Kermanshah.

**Methods.** Records of patients from 2000 to 2005 were reviewed for data of gender, age, residence, anatomical location of tumor and signs and symptoms of CRC. Tumors located at and proximal to the splenic flexture were defined as right sided cancer and tumors arising distal to the splenic flecture were defined as left sided cancer.

**Results.** A total of 152 patients were included in the study (59.9% adenocarcinoma, 35.5% polyps and 4.6% others). Patients of CRC were 67% male and 33% female with mean age of 52.5 (SE = 2.3) for males and 53.2 (SE = 2.75) for females, 73.4% of males and 30% of female were less than 40 and 73.4% and 70% of were more than 40 years old respectively. Tumors of 71% of patients were left sided tumors and 29% right sided (sigmoid 23; rectum 22; ascending colon 13.8; secum 7.6; rectosigmoid 6.1; transverse colon 4.6; splenic flecture 3.1 and hepatic flecture 1.5%). The most common symptoms among the patients were: abdominal pain (31%), rectal bleeding (%), weight loss (23%), vomiting (13%), anorexia (13%), peritonitis (6%).

## P50

### A comparison between open, laparoscopic, and robot-assisted surgery in the treatment of colon cancer: prospective, monocentric short-term outcomes evaluation over 30 months

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**Background.** During last years, colon cancer surgical therapy could benefit from new techniques like laparoscopy and robotic surgery. However, many treatment disparities exist among different centers for patients affected by the same kind of tumors.

**Methods.** From October 2007 to April 2010, 249 patients underwent colectomy for cancer at the European Institute of Oncology. In all cases there were no formal contraindications to minimally invasive approach. Among all the patients, 131 underwent open surgery, 44 laparoscopic and 71 robot-assisted colectomy. Data were recorded prospectively by independent researchers.

**Results.** Duration of surgery was significantly longer for minimally invasive procedures ($151 \pm 49$ open *vs.* $221 \pm 56$ laparoscopic *vs.* $202 \pm 45$ robotic colectomies) ($p < 0.001$ open *vs.* laparoscopic and $p < 0.001$ open *vs.* robotic). Overall complication rates (Dindo classification) were 41%, 36% and 38% for open, laparoscopic and robotic colectomies respectively ($p = 0.93$) and anastomotic dehiscence were 4 (3%) *vs.* 1 (2%) *vs.* 6 (9%) ($p = 0.27$) respectively. Postoperative mortality was nil. Mean time (days) to first bowel movement to gas was 3.4 *vs.* 2.9 *vs.* 2.7 respectively for open, laparoscopic, and robotic colectomies (open *vs.* laparoscopic, $p = 0.019$; open *vs.* robotic, $p < 0.001$). Postoperative hospital stay (days) was 7.5 *vs.* 6.0 *vs.* 6.6 for open, laparoscopic and robotic colectomies respectively (open *vs.* laparoscopic, $p < 0.001$; open *vs.* robotic, $p < 0.001$).

**Conclusions.** Despite a higher duration of surgery, laparoscopic and robotic colectomy for cancer may present some advantages in comparison to open surgery in terms of faster recovery. Short-term outcomes for laparoscopic and robot-assisted colectomy for cancer are similar.

## P51

### Curative surgical resection for colorectal cancer: are the outcomes justified?

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**Background.** With an aging population the management of colorectal cancer in elderly patients presents unique challenges. In part this is due to a paucity of surgical outcome data in this high risk age group. The aim of this study was to determine surgical outcomes following curative resection in the age group eighty years and above.

**Methods.** Patient outcomes were studied between April 2004 and December 2009 from a prospectively maintained database. This was supplemented with data from patient records.

**Results.** Three hundred and fifty-eight patients (46% male) with a median age of 84 years underwent curative resections for colorectal cancer. Seventy-four percent underwent elective resection.

| | Elective | Emergency | |
|---|---|---|---|
| % colonic tumour | 76 | 24 | |
| % T4 tumours | 11 | 24 | |
| Median length of stay (days) | 14 | 19 | $p = 0.01$ |
| Re-admission rate (%) | 3.8 | 1.9 | |
| Further surgery (%) | 7.9 | 7.6 | |
| Overall complication rate (%) | 54 | 46 | |
| 30 day mortality (%) | 8.2 | 20.9 | $p < 0.001$ |
| 12 month mortality – all causes (%) | 25.5 | 44 | $p < 0.001$ |

At a median follow up period of 4 years, overall survival was 46.9% (49% *vs.* 41%) [NS].

**Conclusions.** Emergency surgery is associated with a significantly higher 30 day mortality compared to elective surgery in this elderly cohort of patients with colorectal cancer. Furthermore whilst elective curative resection is associated with an appreciable complication rate, the one-year survival approaches 75%. These outcomes could support undertaking elective curative resection in the elderly and allow for an informed discussion.

## P52

## Indications for manual or mechanical anastomoses, used during different sphincter-preserving operations

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**Background.** The level of the resection of the rectum in the case of CDR defines the mode of the SPO and they could be abdominal (low and ultralow ARR) and abdomino-transanal operation (proctectomy and intrasphinteric resection). The distal resection line is approximately 4–5 cm from the ACV for the first kind of operation and 1.5–2.5 cm for the second one.

**Objective.** To define the indications for a mechanical or a manual anastomosis in SPO with different approach for resection.

**Methods.** One hundred and sixty-two SPO for CDR were done. Twenty-four of them (22 ultralow ARR and 2 proctectomy) were finished with a mechanical anastomosis. One hundred and Thirty-eight interventions were performed with a manual anastomosis and most of them were abdomeno-transanal resections and low ARR.

**Results.** There were 4 (16.6%) clinically considerable cases of an anastomoses insufficiency, when used a mechanical anastomosis, 3 cases after ultralow ARR and one after proctectomy. There were 24 (17%) cases of leakage after manual anastomoses, 8 of them after a proctectomy without a protective stoma and they were clinically considerable.

**Conclusions.** The complications of the mechanical and manual anastomosis are similar after SPO for CDR. The use of a mechanical stapler is obligatory during an ultralow ARR because it could avoid a transanal approach. The manual anastomosis is fundamentally used in the transanal resections with complete removal of the rectum were the level of resection made impossible the usage of staplers. Only 2 from 99 such operations are finished mechanically. The lack of a technical difficulty during low ARR determines the usage of a manual suture or stapler on the surgeon preference. The transanal resection (proctectomy, intrasphincteral resection) is an evidence for a manual anastomosis.

## P53

## One-step proctocolectomy with an ileal pouch and protective ilestoma

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**Background.** Surgical tactics – the first colectomy and second stage proctectomy with j-pouch requires 2 laparotomies with an interval of 4–5 months to create a pocket. PIS closing is the third intervention and it increases the operative risk.

**Objective.** To introduce one-stop restorative PC with j-pouch. Follow-up the postoperative complications and functional effect.

**Methods.** Five female patients, 4 with FAP and 1 with UC were operated within 3 years. The operations were PC with j-pouch and PIS. Cancer infiltration of the uterus and vagina was found during operation by the patient with UC. The extended volume for radical operation was combined with posterior pelvic evisceration. Two patients with APF also have cancer degeneration.

**Results.** No complications were registered during surgery, on average lasting 4 h and 15 min. The continence is achieved within 3–4 months and PIS are closed in these periods without the need for medial laparotomy. The

complete adaptation by one of the patients made possible her conceiving, carry and give birth trough sectio cesarea 3 years after the PC.

**Conclusions.** One-stop PC shortens the period to treat patients, but the volume of intervention requires good general condition and need to refer patients in time for surgery. Three of the operated had cancer degeneration (2 with FAP and 1 with UC). Operational risk is acceptable and allows expansion of the volume of intervention to achieve radical surgery. Saving the sphincter and creating long enough pouch are prerequisites for good functional outcome and adaptation to restorative PC. Single-step interventions took place without postoperative complications and the patients stood them well. PIS is needed for the duration of incontinence, which overcomes the establishment of dietary habits and exercise to volitional control to optimize the anal function, and to complete social adaptation.

## P54

### Surgical treatment of colorectal cancer metastases in liver

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**Background.** Colorectal cancer metastases can be primarily treatetd by surgery or after nedoadjuvant treatment. Liver metrastases are the only ones who have specific thrapy directed to them. Patients with colorectal cancer will have liver metastases in 50% of cases. Life expectancy of untreated patients with liver metastases is 6–18 months.

**Methods.** Surgical procedures of liver metastases include anatomical or extraanatomical resection, radiofrequent ablation and the combination of reseciton and ablation. During the period from June 2007 to January 2010. we operated on 78 patients with colorectal cancer metastases in liver. We evaluated the results in retrospective study.

**Results.** Out of 78 patients we performed surgical resections in 46 patients. We performed 14 hepatectomies, 5 left lobectomy, 11 resecitons of two segments, 9 resections of one segment. In all other patients we performed extraanatomical resections of metastases. We used cavitrone CUSA for liver resections, in 21 patients we performed radiofrequent ablation (RAT) of multiple liver metastases (3–9). The ablations was performed after laparotomy by Radionics. We used combination of liver resection and ablation procedures in 17 patients. In 27 patients liver surgery was performed in the same act with colorectal surgery. The median follow up of our patients was 16 months (range 1 from 1 to 32 months). One year survival was 71% and 3-year survival was 47%.

**Conclusions.** Surgical tretment of colorectal cancer metastases in liver is the oncological modality of choice. This procedures is considered to be safe if performed by the well trained surgical team. The selection of patients and the surgical plan are of tremendous importance. This modality of treatment has significantly increased survival and ehanced the effects of postoperative chemotherapy.

## P55

### Laparoscopic colectomy for colon cancer, single center experience in Iran

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**Background.** Laparoscopic colectomy is a well accepted procedure for colon cancer. The aim of the present study is to present our experience in 36 cases of laparoscopy for colon cancer

**Methods.** A retrospective review of 227 patients of laparoscopic colorectal surgery is performed between 2007 and 2010. Thirty-six cases with colon cancer are reviewed in this presentation.

**Results.** Thirty-six patients with colon cancer were treated with laparoscopic colectomy. Laparoscopic right hemicolectomy was performed for 15 patients, resection of transverse colon for 3 patients, left hemicolectomy in 9 patients and sigmoid resection in 9 patients. Proximal and distal margin of all cases was free, lymph node resection was adequate. There was 7 post operative complications including intra-abdominal collection (2 patients) post operative ileus (3 patients), wound infection (2 cases).

**Conclusions.** Our experience shows that laparoscopic colectomy for colon cancer is a safe procedure with perfect oncologic results. However, it remains a complex technique, requiring an adequate learning curve.

## P56

### Clinical characteristics and prognosis of colorectal signet-ring cell carcinoma

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**Background.** Colorectal signet-ring cell carcinoma (SRCC) is very uncommon. The aim of this study was to

evaluate the clinical characteristics of primary and metastatic colorectal SRCC.

**Methods.** We retrospectively examined the records of patients who had undergone surgery for colon cancer and was diagnosed pathologically as having colorectal SRCC for 13 years. We used American Joint Committee on cancer (AJCC) sixth edition staging systems.

**Results.** Among 1812 patients with colorectal cancer examined, the number of patients with SRCC was 28 (1.5%). Eight of them (28.6%) were metastatic and 20 patients (71.4%) were primary. The male-to-female ratio was 19:9 and the mean age was 44.2 years. The topographic incidence of primary SRCC were 9 patients in rectum, 5 patients in sigmoid colon, and 6 patients in ascending colon. Positive rate at first biopsy was 72.2% (13/18) in primary SRCC. Five cases (55.6%) of rectal SRCC showed linitis plastica type. The stage of primary SRCC showed a preponderance of AJCC IIIb lesions: 3 (15%) were in IIa stage, 1 (5%) was in IIIa stage, 14 (70%) were in IIIb stage, 2 (10%) were in IV stage. One- and two-year survival of primary SRCC was 62.7% and 45.7%, respectively.

**Conclusions.** Colorectal SRCC is rare and constitutes 5% of colon cancer. However, the case in which SRCC is especially primary or occurs in rectosigmoid area is common in young age group. The primary SRCC were mostly found in advanced stage, and the prognosis might be poor.

## P57

## Totally laparoscopic right hemicolectomy for cancer – technical aspects

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**Background.** Feasibility and safety of laparoscopic onocological colectomy are now validated. Aim of this paper is to show technical details of totally laparoscopic right colectomy for cancer.

**Methods.** The patient is in supine position with right arm alongside the body. Three trocars are used: One 10 mm periumbilical port which a 30° camera is introduced after appropriate $CO_2$ insufflation, two left sides port: one 10 mm in the left iliac fossa and one 12 mm in the left upper quadrant. A lateral to medial approach with an early vascular control is the technique applied. The peritoneal layer is opened at the level of the duodenum and the space anterior to the Toldt's fascia is sharply dissected and the ileocolic vessels are isolated and divided. After division of the right colic vessels the ileum is transected with a blue cartridge linear stapler. The right paracolic gutter colonic attachments are divided, the right flexure is completely mobilized and the transverse colon is transected with a 45 mm blue cartridge linear stapler. A side-to-side ileocolic anastomosis is performed with a 45 mm blue or green cartridge linear stapler and the defect is closed with an intracorporeal running suture. Finally the specimen is placed within an endobagand extracted through a suprapubic minilaparotomy.

**Results.** From 2007 to April 2010, 21 patients mean ages 66 years, with histologically proven cancer have been treated by a totally laparoscopic right hemicolectomy. The mean operative time was 110 min. No intraoperative complication were registered. The mean time of bowel movement was 2 days and the mean hospital stay was 5 days. The mean number of lymph node s harvested was 18.

**Conclusions.** Totally laparoscopic treatment of the right colon cancer is safe and radical. Other studies are necessary to determine the advantages of this technique in comparison with laparoscopy with the open technique.

## P58

## Impact of postoperative complications on disease free survival in colorectal cancer patients

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**Background.** Approximately 30% of patients operated on for colorectal cancer, with an expectedly favourable prognosis suffer recurrence.

**Aim.** To evaluate the impact of postoperative complications following radical surgery for colorectal cancer on disease free survival.

**Methods.** There were 1329 patients operated for colorectal cancer in Surgical Department, 1st Medical Faculty, Thomayer Teaching Hospital Prague, from 1994 to 2008. The possible prognostic factors were studied in prospective study. In multivariative analysis following prognostic factors were included: TNM stage, T, N, M, grading of tumor, radicality of operation R, gender of patient, CEA and CA 19-9 level, extent of lymphadenectomy, complications after operation, comorbidity, acute *vs.* elective operation.

**Results.** The main prognostic factor for disease free survival in patients after curative R0 resection for colorectal cancer is TNM stage. In patients in TNM stage II and III is the most decisive predilective factor postoperative complication. In TNM stage IV the most important prognostic factor is tumor grading. In TNM stage II without complications the main prognostic factor is CA 19-9 level above 7.3 mmol/l, in TNM III group CEA level above 3.7 mmol/l.

**Conclusions.** In our cohort of R0 operated patients, postoperative complication is the second most important prognostic factor following TNM stage of the colorectal cancer.

## P59

### Decreasing of mortality at colorectal surgery by the help of the "intestinal intubator with drain and irrigator"

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Strategy of colon cancer surgical treatment is determined by threat of anastomosis leakage. The leakage takes place in 5–15% of patients. One of leakage reasons – anastomosis sutures' infecting because of absence of possibility to disinfect colon. Plenty of colon content forces surgeon not to remove tumour, but to put unloading ostomy. For example, 3/4 from 180 polled American surgeons in case of sigmoid colon obstruction or perforation choose the multistage approach with unloading ostomy on the first stage. The alternative to putting colostomy, the necessity to live with it, and also to 1–2 subsequent operations, is an onestage resection, accompanied with colon lavage. On-table lavage with such systems as "Coloclean" and "Retrowash" did not get distribution as those are: impermissibly traumatical, time-consumpting, doesn't provide colon disinfection, doesn't release colon from washing liquid, doesn't protect anastomosis in postoperative period.

The new system "*intestinal intubator with drain and irrigator*" unlike existing, operates during the surgery before putting of anastomosis and protects it after surgery. The system provides: on-table atraumatic colon intubation up to cecum during 1–3 minutes, colon lavage with average speed 5 l per minute, colon disinfection, complete releasing of washing liquid from colon, anasomosis' vacuumizing and hermecity verification during postoperative period.

Colon is intubated by 2 forces by "push-and-pull" principle. The source of "pull" force is thin-walled tube, everted under the gas pressure, with drain falling out from it. The source of "push" force is the feeder in a shape of the "cylinder-piston" unit. Intubator is managed by pedal, surgeon controls direction of its evertion by hand. Drain is a spiral, concluded into meshed shell. Spiral excludes overbends of channel, the mesh does not skip large parts in it. Inside the drain there is an irrigator in the shape of thin-walled sleeve with numerous punctures.

## P60

### Early closure of loop ileostomy: experience from a single center

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**Background.** This was a pilot project prior to full implementation of early loop ileostomy closure (within two weeks) following low anterior rectum resection, in a group of patients selected according to previously recommended criteria in the literature for a safe early ileostomy closure.

**Methods.** Retrospective review of medical records. Patients undergoing of loop ileostomy closure between December 2009 and October 2010 were analyzed. Data collection included: Demographics, information about the tumour, perioperative data, postoperative complications, closure operation and its postoperative period, and follow up.

**Results.** Eleven patients were included (men = 4), with median age of 58 years (range 47–79). Ileostomy closure was done at a median of 10 days (range 8–13) following rectum resection. Median hospital stay was 16 days (range 14–24). No re-laparotomies were done. One patient developed a pelvic pus collection 10 days post closure and was treated conservatively. One patient died 32 days after closure operation for reasons not related to surgery.

**Conclusions.** Early closure of loop ileostomy appears to be safe in selected patients.

## P61

### Laparoscopic curative resection of colorectal cancer in octogenarians and nonagenarians: is it feasible and safe?

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**Background.** Ageing of the population and longer life expectancy have brought increased number of elderly patients, including octogenarians/nonagenarians, with colorectal cancer to search for treatment and receive curative resection.

**Methods.** We studied the outcomes of curative laparoscopic colorectal resection for cancer (LCR) in this subgroup of population.

**Results.** Perioperative outcome of patients ≥80 years old ($n = 44$, Group C) undergoing LCR (June 2005–January 2009) were compared with findings in younger patients, <70 years ($n = 99$, Group A) and 70–79 years ($n = 73$, Group B). There was a significant difference in co-morbidities among groups, with a significantly higher proportion of ASA III/IV compared to ASA I/II pts in Group C (75.6%) *vs.* Group A (10.4%, $p < 0.01$) and B (49.2%, $p < 0.001$) taken separately and together ($p < 0.001$). Percentage of right hemicolectomy (RH), left hemicolectomy (LH) and anterior/low anterior resection (ALAR) in the three groups was 25.2, 30.1 and 43.2 (RH); 44.4, 34.2 and 25 (LH); 25.2, 23.3 and 20.4 (ALAR). Higher postoperative 'medical' morbidity was observed in Group C (18.2%) compared to Group A (3%) and B (8.2%) together ($p = 0.036$) or *vs.* Group A alone ($p = 0.009$) but not *vs.* B alone ($p = 0.14$). Interestingly 'surgical' morbidity was

similar in Group A, B and C (4%, 4.1% and 4.5%, respectively). Reoperation rate was 0%, 4.1% and 0% in Group A, B and C, respectively ($p > 0.999$).

**Conclusions.** Co-morbidities are mainly responsible for higher morbidity rate reported in very elderly patients. Surgical morbidity/reoperation rates are not affected by age in these patients. Advanced age, *per se*, should not be considered a contraindication to curative LCR.

## P62

## Laparoscopic resection of colorectal cancer: matched comparison in younger and elderly patients

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**Background.** Several studies have addressed the issue of the feasibility of laparoscopic colorectal surgery for cancer (LCR) in elderly patients, but always choosing an arbitrary 'cutoff' age limit, retrospectively evaluating the outcomes.

**Methods.** Aim of this study was to assess the effects of age on the outcome of LCR, by comparing younger and older patients, matched by ASA score and type of operation.

**Results.** Perioperative outcome of patients ≥75 years old undergoing LCR (June 2005–January 2009) were compared with findings in younger patients, matched by ASA score and type of operation. The analysis considered 100 patients, 50 < 75 years (Group A) and 50 > 75 (Group B) years old. There were 18 right emicolectomies, 16 left hemicolectomies, 4 anterior resections, 9 low anterior resections, 2 Miles' operation and 1 segmental resection in each group. Median operative time was [median (IQR)]: 180 min (136–240) in Group A and 168 min (120–210) in Group B, $p = 0.32$. Conversion rate was 4% and 6% in Group A and B, respectively, $p > 0.999$. There was a significantly higher overall morbidity rate in elderly patients (24% *vs.* 8%): medical morbidity rate was higher in elderly (20% *vs.* 2% in younger) while surgical morbidity rate was similar (4% *vs.* 6%) in the two groups. The reoperation rate was similar in the two groups (2% *vs.* 4%, respectively).

**Conclusions.** Short-term results after LCR for cancer in patients over 75 years reveal a higher postoperative risk compared to their younger counterparts, even when matched by ASA score and type of operation. It suggests that although advanced age, *per se*, is not a contraindication, however represents a risk for LCR for cancer. This surgery in elderly patients should be considered preferably in well experienced centers to keep postoperative risk to a minimum.

## P63

## Diagnosis and treatment of colorectal cancer recurrence

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**Background.** Five-year survival rate of patients with local recurrence of colorectal carcinoma (CRC) is generally only 10–20%. The local recurrence (LR) means recurrence of tumor in the original field of operation, where curative surgical resection was performed. CRC recurrence is most frequently presented by distant metastases in the liver and lungs, and local recurrence. All intraabdominal forms of recurrence of colorectal carcinoma, other than metastases in the liver, are considered locoregional failure of treatment.

**Methods.** Maximum frequency of local recurrence of CRC occurs in the first two years following the initial potentially curative resection. Intensive follow-up in this period is therefore reasonable. It should be based on the personal history, the clinical examination, and the examination of tumor markers (particularly carcinoembryonal antigen – CEA). The other examinations are indicated only for patients with abnormal findings or during normal annual check-ups. In the event of suspected recurrence of the CRC we do not hesitate to apply the available radiologic, endoscopic and also other diagnostic methods (transcutaneous US, ERUS – endorectal ultrasonography, CT, MRI, irigography, colonoscopy, and also FDG-PET and PET-CT) hoping to detect recurrence at the stage of resecability.

**Results.** Recurrence of colon cancer is less frequent than recurrence of the rectal cancer. The task and scope of surgical treatment have not been clearly determined until now. R0 resection of recurrence allows to achieve the best results in long-term survival of patients. Early diagnosis of asymptomatic recurrence of patients with colon cancer, usually based on follow-up, results in 5-yr survival rate of 30–70% patients who have undergone additional potentially curative resection. Local recurrence of rectal carcinoma is detected or suspected histologically confirmed or non-confirmed recurrence of carcinoma located in the pelvis. System recurrence (SR) of rectal carcinoma is extrapelvic recurrence. LR of rectal cancer is a great therapeutic dilemma. This applies particulary to young patients who are otherwise in a good physical condition and who have already received maximum biological dose of adjuvant radiotherapy. The non-treated patients with local or locoregional rectal cancer recurrence have the median survival of 7 months. By applying solely the radiotherapy, this indicator is only slightly better and varies between 10 and 17 months. In case of complete resection of recurrence, the 5-year survival rate of patients can be achieved according to some authors at the level of almost 34%.

**Conclusions.** The salvage surgery for recurrence of CRC covers a large scale of surgical performances from limited local resections up to extensive surgery including pelvic exenteration and peritonectomy. However, the potentially curative resection (R0 and R1) of colorectal carcinoma is a sole confirmed factor which has direct positive influence on the overall survival of patients.

## P64

## Reconstruction of colonic continuity after Hartmann's procedure for colorectal cancer

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**Background.** Today, 75 years after its introduction, Hartmann's procedure is still indicated in difficult and complex situations on the field of emergent colorectal cancer surgery. There is still debate on the tactics, timing and technique of the reconstructive operation. The main objective is optimal social and work rehabilitation of the patients with colostomy.

**Aim.** The aim of the presented study is to analyze the results of colon reconstruction after Hartman's procedure especially for CRC for 10 years' period/2000–2011/. Special attention is spared on technical difficulties during surgery, timing of the reversal, the use of staplers and postoperative complications.

**Methods.** For that period 57 Hartmann's reversals were undertaken. There were 31 (54, 38%) males and 26 (45, 62%) females. Mean age was 55 years (range 24–80 years). In almost 2/3 of the cases previous operation was done due to obstructive colorectal cancer – 36 patients (63%), traumatic injuries of the colon or foreign bodies – 9 patients (16%), diverticular disease or complicated proctocolitis – 8 patients (14%) and miscellaneous 4 (7%).

**Results.** The mean time interval between the original operation and its reversal was 4 months. The types of anastomoses and the use of staplers were described. Mean length of stay was 17.4 days. The rate of wound infection was 16 (28, 1%), anastomotic leaks – (3, 5%) and wound dehiscence – 1. There was one death (1, 75%).

**Conclusions.** There is enough evidence from our study that the method of choice after Hartmann's procedure should be one moment restoration of digestive continuity. We prefer extraperitonisation of the colonic suture, whenever it is possible, with extra peritoneal or presacral drainage. The use of staplers makes the operation shorter and the anastomosis more secure. In our opinion, there is no indication to delay reconstructive operation more than 3–6 months with an acceptable morbidity and a negligible mortality.

## P65

## Risk factors and complications in planned colorectal cancer surgery

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**Background.** Although there is a great progress in surgical technique of colorectal cancer surgery, they still remain clear-contaminated procedures. In these cases considerable bacterial invasion is registered as in the peritoneal cavity, as well as in the wound surfaces, both lymphogenic and through the bloodstream. CRC occurs more often in advanced age, polymorbid and immuno-compromized patients. The combination of contaminated field, major and prolonged surgery, old age and concomitant disease are prerequisites for many surgical and non surgical complications. The question of surgical assessment and perioperative risk factors is still on debate.

**Aim.** The objective of the following study is to analyze the rate and structure of surgical complications in planned CRC surgery. In this respect the important prognostic risk factors, related to staging of preoperative risk are classified and discussed.

**Methods.** A retrospective 10 year (2000–2010) clinical study has been performed including 769 patients with planned CRC surgery. Age varied from 22 to 92 years ($63.14 \pm 10.493$ mean). Results were statistically processed by parametric analysis – ($\chi^2$) Pirson criteria, variation and graphic analysis. Results are expressed as mean $\pm$ standard bias (mean $\pm$ SD). Differences were assumed as statistically significant at $p < 0.05$. SPSS for Windows (SPSS, Chicago, Ill, USA) was used to process the individual statistical chart of every single patient including protocol with more than 100 variables in pre-, intra- and postoperative components.

**Results.** More than half of the patients (52.2%) were in II stage, 16.5% – stage I, 19.8% – stage IV, 10.7% – stage III. Radical surgical procedures were 423 (56%, Hartmann-42 [5%]), others – 39%. Complication rate coincides with the literature report rate (5–25%), wound complications – 19.8%, pneumonia – 4.2%, tromboembolism – 3.8%, clinical anastomosis dehiscence – 3.1%, lethality – 2.5%. Bacterial translocatian tested by samples from peritoneal exudates, lymph nodes and portal blood were positive in 3 (10.7%), 9 (32.1%) and 12 (42.8%) respectively, the leader being *E. coli*. The general translocation rate in CRC patients was 53 (6%) with statistically significant difference $\chi^2 = 23.077$, $p < 0.001$.

**Conclusions.** In CRC patients there is prmary contamination of extraintestinal tissues with potential microflora – source of a following infection, independent of the surgical technique. Interpreting wisely the risk factors enables foreseeing surgical complications and performing the most adequate preoperative preparation and operative procedure.

## P66

### Risks and limitations of endoscopic treatment of large colorectal polyps: an Algerian experience

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**Background.** Endoscopic removal techniques of colorectal polyps did not cease evolving, the problem that is posed now is not technical resectability, but rather the benefit/risk of endoscopic management. The aim of our study was to assess the risks and limitations of endoscopic resection of large polyps (≥20 mm) compared to small polyps (10–20 mm).

**Methods.** Among 174 patients who underwent endoscopic resection of colonic polyps between 01/2007 and 12/2009, 66 (group 1 M/F: 39/27, mean age: 53.36 ± 16.70 years) had 70 polyps with a diameter ≥20 mm and 108 (group 2, M/F: 67/41, mean age: 56.29 ± 17.05 years) had 154 polyps with a diameter (10–20 mm). The macroscopic and microscopic aspects of polyps, details and results of the resection, complications were analyzed and compared between the two groups.

**Results.** The main type of polyps found in the two groups was the pedunculated type (87.14% *versus* 59.09%) located in the rectosigmoid (87.14% *versus* 76.62%). In group 1, 10% were treated by mucosectomy, *versus* 7, 14% in group 2. 52, 45% of pedunculated polyps in group 1 needed an bleeding prevention technique (21 with endoloop, 11 with clips placement associated with adrenaline injection at the base of the pedicle) *versus* 08, 79% in group 2 ($p < 10^{-6}$). The piecemeal resection was performed in 8, 57% in group 1 *versus* 5, 19% in group 2 (NS). In group 1 the polyps were tubular in 31.4%, tubulovillous 50%, villous 4.28%, serrated adenomas 0% and hyperplastic 5.71% *versus* 50%, 28%, 0%, 3.24% and 12.33% respectively in group 2. The rate of high grade dysplasia and adenocarcinoma was higher in group 1, 40% (27 high grade dysplasia and carcinoma *in situ*, 01 invasive carcinoma) *versus* 5.84% in the group 2 (09 high grade dysplasia, 00 carcinoma *in situ*, 00 invasive carcinoma) ($p < 10^{-6}$). 03 patients underwent a surgical treatment secondarily (02 in group 1 and 01 in group 2) (NS). Bleeding complications rate was greater in group 1 (10%) than in group 2 (2.6%) ($p = 0.004$). No cases of hemorrhage were found after use of preventive technique in the two groups. All cases of bleeding were successfully treated by endoscopic method and no deaths were observed in both groups. The early endoscopy between 3rd and 6th months was achieved in 47, 14% in group 1 *versus* 11, 68% in group 2 ($p = 0.007$).

**Conclusion.** The resection of large colorectal polyps has two types of risks. First, a technical one, that consists of bleeding complications which require the availability of means of prevention and endoscopic hemostasis. The second risk is carcinological with a high prevalence of carcinomas which requires endoscopic resection of good quality and rigorous follow-up.

## P67

### Surgical treatment of colorectal cancer (CRC) in older adults the influence of age and laparoscopic surgery on postoperative results

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Colorectal cancer (CRC) is the second most common cause of death among all malignant neoplasms. According to data from the National Cancer Register 4418 new patients with CRC are registered in 2008. In 2882 (65%) cases the disease is registered over age 65. For the period 01.06.2008–15.09.2010 142 patients with colorectal cancer were operated in the Clinic of Surgery at MMA (MHAT), Plovdiv, 55 women (39%) and 87 men (61%). 86 (61%) of these patients are over 65 years of age. In 30 (21%) patients laparoscopic resection is performed. We use the Karnofsky Performance Scale and the Charlson Comorbidity Score for assessment of the preoperative performance status. The anesthesiological risk is evaluated according to the ASA criteria. Age is not a limiting factor for radical surgical treatment of CRC. Despite the significantly higher comorbidity rate in elderly patients, postoperative complications are comparable with those among patients under 65 years of age. Laparoscopic resection of colon of elderly patients demonstrates early recovery of intestinal function, short hospital stay and less cardiopulmonal complications.

## P68

### Combined and exdended radical operations in colorectal carcinoma patient

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**Background.** This is a report on radical operative interventions performed in 610/805 patients presenting complicated disease, from all 1673 operated colorectal cancer patients covering the period 2000 through 2009. Combined operation is en bloc (simultaneous) operative removal of the part of the rectum or the colon that carries the tumor and parts of the infiltrated neighboring organs and tissues. Extended operation is expanding the volume of the resection in the length of the intestinal canal in

order to include lymph nodes that have or probably have metastases or when the tumor is synchronous.

**Methods.** Retrospective analysis.

**Results.** One hundred and eighteen patients are subjected to combined and extended operations, distributed as follows: 71 combined and 47 extended. From 71 combined surgical interventions only 24 are with localization in left colon, other 10 – in right colon, 8 – in transversal part of the colon and the rest 29 – in rectal part. In 20 patients with abdominoperineal extirpation the combined interventions include: hysterectomy (2), ovariectomy (6), partial resection of vagina (7), prostate gland resection (2) and bladder resection (3). In case of resection of rectum after Hartmann, combined intervention is done in seventeen. Extended operative interventions are in case of plural cancer or locally advanced tumor with obstruction of the lumen and ileus. In 5 patients proctocolectomy was accomplished caused by diffuse familial polyposis. In 9 patient was accomplished total colectomy caused multiple malignancies in different parts of the colon, extended left hemicolectomy – in 5 and right – in 4 patients.

**Conclusions.** The ménage of treatment and operative tactic depends of many factors important for surgeon. It is strictly necessary to choose an adequate operation for each patient in accordance with tumor staging and availability of different complications of the tumor growth. Postoperative lethality amounts to 12.9 per cent of patients with complicated colorectal cancer undergoing combined or extended surgical interventions.

## P69

## A comparative experimental study of the effects of topical fibrin glue and epidermal growth factor on the phases of colon anastomosis healing process

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**Background.** The aim of this experimental study was to investigate whether covering the colonic anastomoses with fibrin glue and combined fibrin glue and epidermal growth factor can protect the healing of colon from dehiscence.

**Methods.** Ninety Wistar rats were randomly divided into three groups. In the control group, after the resection of the middle transverse colon, an end to end single layer running sutured anastomosis was performed. In the second and third group, anastomosis protection was performed with extraluminal application of fibrin glue (coating) and combined fibrin glue and epidermal growth factor. The bursting pressure and hydroxyproline content were recorded.

**Results.** The bursting pressures were significantly lower in the control group than in the other groups ($p < 0.001$). There was no statistically significant difference in the median pressures in fibrin glue only and fibrin glue plus epidermal growth factor groups ($p > 0.05$). There were significant differences in hydroxyproline values between controls and fibrin glue or combined fibrin glue and epidermal growth factor groups. The difference between fibrin glue plus EGF group and fibrin glue only group was statistically significant (to the advantage of the former) only on postoperative day XIII ($p < 0.05$).

**Conclusions.** The results demonstrate that local protective measures in colonic anastomosis yield better results; the application of fibrin glue and combined fibrin glue and epidermal growth factor demonstrated similar results.

## P70

## Bevacizumab does not impair wound healing after resection of colorectal liver metastases despite persistent VEGF inactivation at wound sites

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**Background.** The antibody bevacizumab (Bev) has proven a promising tool for anti-angiogenic cancer therapy by neutralizing vascular endothelial growth factor A (VEGF). Although VEGF is known as a major regulator of wound healing and liver regeneration, the incidence of postoperative complications at these sites is unexpectedly low in patients after neoadjuvant therapy including Bev. Mechanistic studies evaluating this discrepancy are limited.

**Methods.** Forty patients with stage IV colorectal cancer received chemotherapy with ($n = 31$) or without ($n = 9$) Bev prior to resection of liver metastases. Plasma samples were taken before and 1–3 days after surgery. Additionally, intraabdominal (abd) and subcutaneous (sc) drainage samples were collected in 24 patients. The percentage of Bev bound *vs.* free VEGF was evaluated.

**Results.** No increased incidence of wound healing complications or postoperative liver failure was observed in Bev treated patients as compared to chemotherapy controls. Postoperative plasma VEGF levels were found to be significantly higher in Bev treated patients ($p < 0.01$). In contrast, VEGF was significantly lower in abd and sc fluid of Bev treated as opposed to control patients without Bev ($p < 0.05$). Furthermore, VEGF was mostly bound by Bev in both, plasma and wound fluid.

**Conclusions.** VEGF feedback production in response to neoadjuvant Bev therapy was detectable by an increase in circulating (systemic) VEGF in the postoperative period. However, at the actual site of wound healing, we found significantly reduced VEGF values in Bev patients, and the remaining VEGF was inactivated by Bev. Therefore, wound

healing seems to proceed independent of VEGF and might be supported by other, compensatory growth factors.

## P71

### Early results after 106 laparoscopic procedures due to colorectal tumours

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**Methods.** Out of 129 colorectal laparoscopic procedures which was done between September 2008 and December 2010 106 laparoscopic operations (52 women) was carried out due to colorectal tumours. Data was gathered retrospectively.

**Results.** One hundred and six patients in average age 65 years (range 32–88) were operated laparoscopically due to benign and malignant tumours with standard method. The majority of the procedures were performed for malignant disease (83%). The most common procedure was right hemicolectomy (32%). The median time of procedures was 165 minute (range 80–300), with conversion in 15 cases (14%). Complications occurred in 24% of patients including 2 deaths due to pulmonary thrombus and infarct. The median length of hospital stay was 7.7 days (range 3–18). In 39% of cases we diagnosed Dukes C and D. The length of colon resected was average 20 centimeters and number of lymph nodes harvested was average 9.8.

**Conclusions.** Our results show that laparoscopic method of operation is safe. Laparoscopic colorectal surgery is technically feasible in a considerable amount of patients under elective conditions. Our results are comparable with other.

# Basic Science

## P72

### Low dose of azidothymidine and didanosine synergize in the inhibition of telomere maintenance and tumor growth

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**Statement of translational relevance.** This preclinical study demonstrates that the combination of two clinically approved anti-viral reverse transcriptase inhibitors, azidothymidine and didanosine, inhibits telomere maintenance mechanisms and induces apoptosis of cancer cell lines *in vitro*. Moreover, this drug combination inhibits growth of tumor xenografts in nude mice when given orally. Most importantly, the therapeutic effects are observed at concentrations, which correspond to basal plasma levels, which have been measured during HIV-therapy and should thus be tolerated by cancer patients. The later greatly facilitates further clinical development of this easy applicable therapy. The finding suggests a novel therapeutic application for two well known antiviral drugs and introduces this drug combination as potentially effective non-toxic telomere maintenance inhibitors.

**Purpose.** A hallmark of tumor cell survival is the maintenance of elongated telomeres. Antiviral reverse transcriptase inhibitors (RTI), such as azidothymidine (AZT) and didanosine (ddI) were shown to inhibit telomere elongation at high, potentially toxic concentrations in tumor cell lines. We hypothesized that those drugs might have synergistic effects enabling successful therapy with lower, non-toxic concentrations.

**Experimental design.** We analyzed biological effects of AZT and ddI at concentrations, which correspond to minimal plasma levels during human HIV therapy in the human tumor cell lines HCT-116, SkMel-28, Mel-Juso and Jurkat. We determined the effect on telomere maintenance, apoptosis, $\gamma$H2AX expression and cell cycle progression. The therapeutic potential of low dose oral application of the RTI combination was assessed in a murine tumor model using HCT-116 cells.

**Results.** Long term co-application of AZT and ddI induced a significant reduction of telomeres in all cell lines. Treatment of cell lines with both RTI led to a significantly increase of $\gamma$H2AX expression, p53-phosphorylation and apoptosis in selected cell lines. The drug combination also induced a significant shift from G0/G1 to S phase in HCT-116 cells. Oral low-dose dual RTI application but not low-dose single RTI application was associated with a significantly reduced tumor growth of HCT-116 cells *in vivo*.

**Conclusions.** The anti-proliferative activity of the combination of AZT and ddI at low concentrations warrants clinical testing in human solid cancer.

## P73

### Impact of immunological function upon survival in colorectal cancer

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**Background.** Colorectal cancer (CRC) induces an immunological response and shifts the cytokine balance. Suppression of CMI (Cell Mediated Immunity) associated

cytokines has been demonstrated in CRC. Our study was aimed at studying the influence of TH1/TH2 cytokines and immune cell counts upon survival in CRC.

**Methods.** Eighty patients who underwent resection for CRC were recruited. Long term follow up was performed on these patients who already had white blood cell composition and levels of cytokines (from activated peripheral blood mononuclear cells) measured. Survival analysis was performed using Kaplan Meier, Log rank and Cox regression models.

**Results.** The preoperative levels of the TH1 cytokines, TNF & IFN-gamma had a significant influence upon the overall survival ($p = 0.014$ and 0.016 respectively, poor survival when levels are low). The survival was particularly poor in older age group (Age > 68) and Stage 4 disease when the TNF and IFN-gamma levels were low. Preoperative measurements of high lymphocyte and low granulocyte counts were associated with improved survival ($p = 0.005$ and 0.027). The preoperative levels of cytokines were not significantly different in the patients who developed recurrent disease ($n = 9$). The postoperative levels of cytokines and cell counts did not influence the survival. The survival rates were similar in laparoscopic, minilaparotomy and conventional laparotomy groups.

**Conclusions.** The preoperative immunological function influences the survival of patients with colorectal cancer. We have identified specific subgroups of patients whose survival may be improved by modulation with CMI/TH1 enhancing agents.

## P74

## Predictive factors for malignancy in colonic adenomatous polyps

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**Background.** Adenomatous polyps are of the main causes of colorectal cancer. In our prospective study we tried to identify possible predictive factors for malignancy of colorectal polyps (CRP).

**Methods.** We have studied one group of patients with 96 consecutive polypectomies, one polyp for each patients. For these, we studied the following parameters of CRP: obesity, smoking, localization, size, endoscopic aspect (pediculated/sessile, surface, bleeding) and histology.

**Results.** From the 96 polyps after polypectomy included, 73 (76.04%) after histopathologic examinations were adenomatous, with high malignant potential, with the following histology: 55 were benign (57.29% subgroup I), 24 were dysplastic (25.00% subgroup II) and 17 were malignant (17.71% subgroup III). We calculated the mean value for all the studied parameters for three subgroups (considering dysplasia as a transition from benign to malignant CP). From all the studied parameters, only the size of polyp of CRP correlated extremely significant with the risk of malignancy ($I = 11.8 \pm 0.9$ mm, $II = 14.6 \pm 2.5$ mm, $III = 18.1 \pm 2.7$ mm, for I–II–III $p < 0.001$ and for I–III $p < 0.001$). The highest percent of malignancy for villous CRP was 25.3%. Obesity in our patients was present in 32% and smoking in 26%.

**Conclusions.** In our study, from the all included parameters only increased size of the polyp correlated significant ($p < 0.001$) with the risk of carcinogenesis. Villous polyps have the highest percentage of malignancy. Other possible risk factors for malignancy, but less significant shoved to be obesity, smoking, bleeding, multiple polyposis and irregular endoscopic appearance of the polyp surface.

## P75

## 5-Fluorouracil inhibits the multidrug resistance phenotype of colorectal cancer

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**Background.** Considering we identified the inhibitory effect of taxanes and platinum drugs on the activity of ABC transporters, and the importance of finding approaches to overcome drug resistance colorectal cancer (CRC) is characterized by a high frequency of multidrug resistance (MDR), in implementing a leading role belongs to the functioning of the ABC-transportes emitting cytotoxic agents from cells. Purpose of the study was to study the effect of 5-fluorouracil (5-FU), widely used for the treatment of CRC, the MDR phenotype of accumulation and distribution model MDR-drug doxorubicin in cells of the CRC.

**Methods.** The study was carried out on biopsy samples of tumors (32 – CRC, 3 – CRC metastases to the lungs) by flow cytofluorimetry adapted for the study of dense tissue. MDR phenotype was assessed by changes in intracellular accumulation doxorubicin under the influence of specific inhibitors of Pgp (verapamil) and MRP (genistein).

**Results.** (1) The phenotype of MDR (Pgp + □ and/or MRP + □) set to 100% of cases. (2) More than half of the studied tumors, as well as 1/2 metastases showed an increase in intracellular accumulation of doxorubicin after exposure to 5-FU. (3) identified two cell responses to the effects of 5-FU: an increase in intracellular accumulation of Doxorubicin accompanied by increasing the content of anthracycline in the cytoplasm of tumor cells and/or a significant increase in the content of Doxorubicin in the nucleus.

**Conclusion.** (1) 5-FU can inhibit the MDR phenotype in the CRC, increasing the accumulation of MDR-drugs in tumor cells, including those in the nucleus. The latter is most important, because it is the content in the nucleus and interaction with nuclear targets is essential in the implementation of the specific activity of most cytotoxic agents. (2) The data show that the sequence of daily administration of 5-FU > anthracycline or other MDR-drug may be sold a specific activity of the latter in the treatment of CRC as a result of inhibition of antimetabolites phenotype MDR.

## P76

## Circulating cell-free tumor DNA as a biomarker of colorectal cancer

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**Background.** Metastatic liver disease from colorectal cancer progression is a significant problem with hepatic resection as the main form of treatment. Non-invasive screening of molecular biomarkers may enable effective surgical intervention through an early diagnosis of the disease. Cancer is characterized by multiple somatic genetic and epigenetic alterations that could be useful as molecular markers for detecting tumor DNA in different bodily fluids.

**Aim.** To investigate presence of cell-free tumor DNA and its correlation to clinical status of the patient, especially metastatic liver disease.

**Methods.** In prospective study there were 108 patients with colorectal cancer included. Tissue samples from primary tumor and where available, additional tissue from nodes and liver metastases were collected. For each patient, multiple plasma samples were acquired over a period covering (i) initial examination, (ii) immediately preceding the surgery, (iii) at the surgery, (iv) post-surgery and (v) during a subsequent follow-up. We have used the most frequent somatic mutations detected in primary tumors to trace cell-free tumor DNA in plasma (KRAS, TP53, BRAF, APC, PIK3CA somatic mutations).

**Results.** Mutations were found in 66 primary tumors (41%). From these patients 57 plasma samples were collected. According to TNM stages mutation were found in 0%, 10%, 28% and 100% respectively. During follow up relapse was confirmed by DNA in 3 patients.

**Conclusions.** Cell-free DNA could be a potential complement to tumour markers for disease monitoring and early detection of progression especially in liver. The specificity of this method is nearly 100%, no false positive results.

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## P77

## Hdm2 gene amplification and the concordant presence of mutated TP53 in primary colorectal cancers

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**Background.** Human MDM2 (Hdm2) is amplified and over expressed in approximately one-third of human sarcomas. Amplification of Hdm2 and mutation of p53 do not generally occur in the same tumor sample. The aim of this study was to analyze the frequency and quantity of human Mdm2 gene amplification (Hdm2) in primary colorectal tumors, and also to determine the concordance of TP53 mutations with Hdm2 amplification.

**Methods.** One hundred primary colorectal tumors were analyzed for Hdm2 gene amplification. The concordant presence of mutated TP53 was also analyzed in a subset of these tumors (96 primary colorectal tumors). Hdm2 gene amplification was analyzed by PCR/Ligase Detection Reaction (LDR) on an AB13100 Genetic Analyzer. The gene amplification results were normalized against 133 normal colon samples. A relative value of >3-fold increase was regarded as gene amplification. TP53 mutations were analyzed by a combination of PCR/LDR, Endo V/Ligase mutation scanning and sequencing.

**Results.** Hdm2 was amplified in 14% of primary colorectal cancers. Twenty-two percentage (13/58) of primary colorectal cancer samples with wt TP53 had Hdm2 gene amplification compared to 13% (5/38) of tumors with mutated TP53 mutation ($p$ = NS).

**Conclusions.** Hdm2 is amplified in quite a large proportion of colorectal cancers (14%) and is likely to have importance in colorectal cancer development. Hdm2 amplification is an early event and is probably not involved in metastasis progression. Hdm2 amplification is not correlated to mutant TP53. The function of specific mutations in TP53 and amplified Hdm2 should be analyzed to further clarify this.

## P79

### Catenin expression alterations depending on stage of colorectal cancer

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**Background.** Catenins are involved in the main pathway that transduces a signal from cadherin to actin of the cytoskeleton, therefore they are also responsible for tissue architecture, and its adhesion properties. The aim of the study was to assess of catenin gene expression alteration depending on colorectal cancer stage, and its potential usefulness in diagnostics.

**Methods.** The study group consisted of 28 patients (14 female and 14 male), who have had resection for colorectal adenocarcinoma in our department. The analysis was performed using microarrays, mRNA was collected from cancer and macroscopically healthy tissue.

**Results.** Agglomerative hierarchical clustering of normalized mRNA levels has shown 4 groups with statistically different gene expression. The control group was divided into 2 groups, the first one was appropriate control (C1), the second one (C2) had the genetic properties of the tumor tissue, without pathological changes histologically and macroscopically. The other 2 groups were: LSC (Low stage cancer) and HSC (High stage cancer). We have identified catenin alpha (CTNNA1), catenin beta (CTNNB1), and catenin delta (CTNND1 and CTNND2) genes with statically significant differences in expression among study groups.

**Conclusions.** Increased expression of catenin coding genes was observed for macroscopically and microscopically healthy tissue, as in lower stage cancer groups when compared with more advanced stages. It varied also comparing C1 and C2 group, which may be potentially useful in distinguishing molecular aberrations in macroscopically healthy tissues. Therefore we find the catenin expression potentially useful in diagnostics of colorectal cancer.

## P80

### Estrogen dependent genes encoding cell adhesion molecules as predictional factors in differntiation colorectal cancer from fine colorectal tissue

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**Background.** Cell adhesion molecules genes in colorectal cancer take part in its progression. Transcriptional activity of these genes depend on many factors, including estrogen receptors.

**Methods.** The aim of our study was to pick and compare estrogen dependent genes attributable to adhesion in colorectal cancer and fine colorectal tissue. The analyses were carried out on colorectal tissues collected from patients with colorectal cancers during the surgery. Transcriptional activity of investigated, estrogen dependent genes, was assessed with use of oligonucleotide microarrays technology.

**Results.** Among 71 estrogen dependent genes encoding cell adhesion molecules, 3 have been selected to differentiate colorectal cancer from fine colorectal tissue. CD44 and ACTN1 appear to be upregulated, and STAB1 – downregulated in colorectal cancer.

**Conclusions.** Our study signalizes that CD44, ACTN1 and STAB1 can be predictional factors, allowing to differentiate colorectal cancer from fine colorectal tissue.

## P81

### Inhibitors of apoptosis proteins (IAPS) in colon cancer

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**Background.** Programmed cell death, plays fundamental role in physiological control of cells growth. Disturbances in balance between death and the proliferation of cells can lead to many degeneration or proliferation processes. The significant role in apoptosis control play the recently detected inhibitor of apoptosis proteins (IAPs) – influencing on division of cell as well as regulating the programmed cell death. IAP can make up the new diagnostic marker of tumours as well as therapeutic goal. In this article we try to find expresion of IAP in colon cancer patientes, using DNA microarray.

**Methods.** Thirty-seven patients with colon cancer (I–IV clinical stage AJCC) (excluding rectal cancer) operated 2009–2010 in Department of General Surgery in Sosnowiec. The fragments of tumors were estimated with microbiological method – DNA microarray and the expression of IAP genes were measured.

**Results.** Thirty-five mRNA were estimated, and expression IAP gene were analysed. We found overexpres-

sion for two IAP gene – Survivin and Livin, in colon cancer in comparison with healthy tissues.

**Conclusions.** Overexpression of IAP (Survivin and Livin) correlates with clinical stage of colon cancer. It could be used as supplementary parameter in diagnosing and the prognose of treatment of the colon cancer.

## P82

## Usefulness of the determinations of serum BCL-2 protein and soluble Cytokeratin-18 fragments (TPS) concentrations to postoperative follow-up in patients with colorectal cancer

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**Background.** The aim of the study was to find an answer to the question whether the serum concentration of antiapoptotic Bcl-2 protein and soluble cytokeratin-18 fragments (TPS) as the proliferation marker make additional information for the postoperative surveillance of patients with colorectal cancer.

**Methods.** The research was conducted among 46 patients (21 with a B Astler-Coller's stage; 25 – accordingly – C) being operated on colorectal cancer (resection RO). The age range from 47 to 85; average age 67; sex: 19 women, 27 men. The patients were divided into 2 groups: I – the patients with a recurrence of cancer, II – the patients without a recurrence of cancer. The control group consisted of 30 healthy people, mainly medical staff. The average CEA concentration in this group was 1.6 ng/ml ± 0.43; TPS: 48.67 U/l ± 9.1; Bcl-2: 0.31 U/ml ± 0.13. The period of observation of the patients and conducting the research was 1–5 years. The disease recurrence or the lack of recurrence was confirmed using physical examination and additional examinations due to the oncological follow-up. From each patient, 10 ml of venous shunt blood was collected, after the centrifuging the serum was frozen to −20 °C. The blood for testing was collected one day before an operation and 1-, 3-, 6-, 12 months after it. CEA was marked by MEIA method using a commercial set by Abbott (USA). A standard concentration for human health was adopted as 3 ng/ml. TPS was indicated by EIA method using sets Immulite/Immulite® 1000 TPS ™ by IDL Biotech AB (Sweden). A standard for human health does not exceed 90 U/I. Bcl-2 concentration was labeled by ELISA method using Bender MedSystems GmbH tests (Austria). A standard for healthy people is <0.5 U/ml. The results obtained were statistically developed. Calculations were made using Microsoft Excel 2003. The Ethical Committee at the Silesian Medical University approved the studies.

**Results.** Out of 46 operated patients, the recurrence was detected in 14 patients including 6 with the initial stage of tumour – B according to Duke's classification modified by Astler-Coller, and 8 – degree C accordingly. The detection time of recurrence was from 6 to 23 months. Most of them were distant metastases: 9 – in the liver, 2 – in the lungs. A local recurrence was observed in 3 patients in intestinal stapling or retroperitoneal space. It was established that Bcl-2 concentration is statistically significantly higher in the recurrence group than in non recurrence group being examined 1-, 3-, 6-, 12 months after an operation. The TPS concentration is statistically significantly higher in the recurrence group than in non recurrence group being examined before and 3-, 6-, 12 months after an operation. The concentration of the following antigen, i.e. CEA, is statistically significantly higher in the recurrence group in relation to the non-recurrence group, as TPS, so in pre-operative determinations and 3-, 6-, 12 months after an operation. Bcl-2, TPS and CEA serum concentrations were unrelated to Astler-Coller's stage of colorectal cancer. Yet, insignificantly higher determinations of CEA concentrations in degree C than B were observed. There were also no dependence among the sex, age of a patient, the original location of the tumour and the recurrence. Clear correlations between the concentrations of determined parameters of all patients (with recurrence and without recurrence group) also were noticed. A strong correlation between the concentrations of all determined proteins it occurred 12 months after an operation in the recurrence group; correlation TPS – CEA in this group was yet observed 6 months after an operation.

**Conclusions.** (1) Statistically significant exceeding of Bcl-2 standards in patients who relapse into colorectal cancer makes information saying about the suppression of cancer cells apoptosis. (2) Statistically significant increase of TPS concentration in recurrence group seems to mean that the suppression of apoptosis is conductive to the excessive proliferation of cancer cells. (3) The findings obtained can be interpreted that the evaluation of Bcl-2 and TPS may have a complementary value to CEA determinations in a postoperative follow-up of patients with colorectal cancer.

## P83

## Microsatellite instability testing of colorectal cancer: which microsatellites matter?

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**Background.** In colorectal cancer, microsatellite instability (MSI+) is a valuable marker of defective DNA mismatch repair that identifies cancers with distinct phenotypic properties, including favorable survival. However, the optimal assay for MSI status is unknown. We have evaluated a simplified three marker assay for MSI and compared it to the traditional five marker NCI consensus panel assay to see if technical variations in MSI testing are important.

**Methods.** DNA samples from 357 snap frozen primary CRCs were evaluated. Microsatellites for the three marker assay (at least 2 of 3 positive: BAT25, BAT26, D2S123) and the NCI five marker assay (at least 2 of 5 positive: BAT 25, BAT26, D2S123, D5S346, D17S250) were objectively tested for size instability using fluorescently labeled PCR primers, an ABI DNA analyzer, and Genotyper software. For selected cases, genome wide copy number variations were evaluated using Agilent 244K arrays. Clinical data was obtained from a prospective database and confirmed by chart review. Immunoblotting was done for expression of MMR genes in 129 tumors. Median follow-up was 60 months.

**Results.** The NCI 5-marker assay identified 96 cancers as MSI+. Only 56 of these were MSI+ by the 3-marker assay, leaving 40 cases identified as MSI+ only by NCI criteria. The remaining 261 cancers were microsatellite stable (MSS) by both assays. Clinical and genetic features of the identified groups were assessed and illustrated more favorable prognosis and characteristics of tumors identified as MSI+ by the 3-marker assay as seen in the accompanying table. In addition, gain or loss of at least one chromosomal arm was observed in 2 of 16 MSI+ cancers (3-marker), 3 of 4 NCI MSI+ cases ($n=4$), and 7 of 8 MSS cases ($p=0.001$).

**Conclusions.** Thus the three marker assay (BAT25, BAT26, D2S123) for MSI-H identifies a smaller patient cohort with distinct clinical, genetic, and morphological features when compared to patients identified with inclusion of the dinucleotide markers and MSS. There is in fact no difference between those identified as MSI-H by the 5 marker assay and those identified as MSS, indicating that MSI assays which contain the mononucleotide repeats are superior for MSI testing. Finally, use of validated, accurate MSI testing will improve prognostic and predictive scoring systems for colorectal cancer.

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## 3-(4′-geranyloxy-3′-methoxyphenyl)-2-trans-propenoic acid promotes the differentiation of colorectal cancer cell line Caco-2 *in vitro* acting as natural PPARγ ligand

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**Background.** The PPARγ ligands are being considered as promising potential chemotherapeutics in various types of cancer. Recently it was shown in animal models that natural and semisynthetic prenyloxyphenylpropanoids show chemoprevention towards cancer colon tumors when used as diatery agents. We aim to investigate if they may act as PPARγ ligands.

**Methods.** The Caco-2 colorectal cancer cell line, used in this study, shows the ability to differentiate spontaneously into enterocyte-like cells. In our study two different culture methods have been applied – proliferating and differentiating cells. The potential of 3-(4′-geranyloxy-3′-methoxyphenyl)-2-trans-propenoic acid to activate PPARγ was investigated using reporter vector system. We also investigated the effects of the propenoic acid derivative on the process of cells differentiation and migration *in vitro*. Cells were stimulated with the PPARγ ligand – ciglitazone and the propenoic acid derivative (1 or 10 μM) for 2 or 6 days. The level of differentiation was evaluated by RT-PCR, immunoblotting, cytoimmunochemistry and scanning microscopy. The ability of cells to cross matrigel coated porous membranes was also measured to assess their migratory potential.

**Results.** Transfection of the cells with reporter expression vectors showed that the tested derivative of propenoic acid acts as a ligand of the PPARγ. Both propenoic acid derivative and well known PPARγ ligand (ciglitazone) were shown to promote cells differentiation and inhibit migration.

**Conclusions.** Presented results suggest that the possible mechanism of dietary cancer prevention with prenyloxyphenylpropanoids is connected with activation of PPARγ in cells of gastrointestinal tract.

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