

Unusual iatrogenic common femoral artery injury during penile prosthesis placement in gender-confirming surgery

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ABSTRACT

Introduction: Gender dysphoria refers to the distress or discomfort experienced when a person's gender identity does not align with the sex assigned at birth. While many transgender individuals affirm their gender identity without surgical intervention, an increasing number undergo gender-confirming surgery. It is essential to recognize and promptly treat vascular complications that can arise during these procedures. There are no previous reports addressing arterial injuries during the implantation of penile prostheses for gender-confirming surgery.

Case presentation: A 33-year-old patient with gender dysphoria underwent female-to-male surgical interventions for gender confirmation. During the latest urologic procedure, which involved the implantation of a three-piece inflatable penile prosthesis, a vascular complication occurred, resulting in injury to the right common femoral artery. Given the extent of the injury and the difficulty in repairing the arterial wall, vascular surgeons resected the damaged artery segment and performed an end-to-end anastomosis. Intraoperative duplex ultrasound at the conclusion of the surgery showed a triphasic waveform in the distal vessels. The urologist decided to postpone the implantation of the penile prosthesis. The patient was discharged on the sixth postoperative day without systemic or local complications and was prescribed single antiplatelet therapy.

Conclusions: With the increasing number of transgender individuals seeking gender-affirming surgery, it is important to conduct a multidisciplinary preoperative evaluation to minimize complications that could affect their quality of life.

Background

Worldwide, male-to-female transgender patients are approximately three to four times more prevalent than their female-to-male counterparts, with the latter population being far less studied. Although many transgender individuals affirm their gender identity without surgical intervention, an increasing number undergo gender-confirming surgery.¹ Among the procedural techniques, penile prosthesis implantation plays an important role, and surgeons need to be aware of the potential, although uncommon, vascular complications associated with such a procedure. In the majority of reported cases, these complications affect the venous system.²

In this paper, we describe the first case of an arterial complication during the implantation of a penile prosthesis in a female-to-male

transgender patient.

Case presentation

A 33-year-old patient with gender dysphoria was admitted to the Urology Department of our hospital in late 2023 for the implantation of an inflatable penile prosthesis. The patient had undergone several previous female-to-male surgical interventions for gender confirmation, including a bilateral mastectomy and uterine adnexectomy for gyno-android conversion in 2017. In 2019, the patient obtained legal consent to complete the sex change.³ In 2021, the patient underwent an unsuccessful phalloplasty, which ended with the repair of the abdominal flap due to poor skin vascularization caused by the previous regional surgery. In 2022, urologists completed the phalloplasty, and in February

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2023, the patient underwent vaginectomy and scrotoplasty. No arterial or venous injuries were reported during these interventions.

At the time of admission, the patient's drug therapy consisted of testosterone, paroxetine, and colecalciferol. The planned intervention was the placement of a penile prosthesis specifically designed for patients with phalloplasty (ZSI 475 FTM, Zephyr Surgical Implants, Switzerland).

This prosthesis consists of a reservoir, an activation pump, and a single cylinder that is introduced into the neophallus.

At the beginning of the surgery, a right lateral incision was made at the base of the neophallus, which was then dilated to create space for positioning the inflatable cylinder. Following this, an incision was made along the spino-umbilical line, between its middle and lateral thirds. The incision was extended through the external oblique fascia to gain access to the space of Retzius, where a right paravesical space was formed for the placement of the reservoir.

In the next step, connection tubes needed to reach the base of the neophallus (Fig. 1). These tubes would have been connected to those attached to the pump and the inflatable cylinder. Generally, the tubes could be routed either beneath Scarpa's fascia or subcutaneously. In this particular case, a subfascial route was selected due to the patient's thin physique, which could have made subcutaneous tubes more visible and palpable.

While passing the subfascial connection tubes between the reservoir and penile prosthesis, the right common femoral artery was accidentally injured, resulting in acute bleeding.

Quick digital compression on the artery controlled the bleeding, and the vascular surgeon was promptly summoned to fix the lesion. Upon clamping the artery through the pre-existing surgical access, a 1.5 cm

long lesion was identified on the anterolateral wall of the artery, just above the femoral bifurcation (Fig. 2). Given the length of the lesion and the intraoperative observation of an extremely fragile arterial wall, the vascular surgeon deemed primary closure unsafe.

As a result, the damaged arterial tract was resected, and an end-to-end anastomosis was performed using the parachute technique with a 6-0 polypropylene double suture, reinforced with a thrombin-based haemostatic matrix (Flo seal, Baxter, Deerfield, ILL, USA). At the conclusion of the intervention, the arterial pulsatility was satisfactory, and intraoperative duplex ultrasound showed a triphasic waveform in the distal vessels. Due to potential risks of infection and bleeding, given the need for postoperative antithrombotic and antiplatelet treatment, the urologist decided to postpone the implantation of the penile prosthesis. At the end of the surgery, a continuous intravenous infusion of heparin was administered for 48 h, maintaining a target activated partial thromboplastin time (aPTT) of 50-60 s, and the patient was closely monitored in the Intensive Care Unit.

On the third postoperative day, the patient was transferred to the urological ward, and by the sixth postoperative day, they were discharged home without experiencing systemic or local complications. The prescribed treatment included single antiplatelet therapy with acetylsalicylic acid, 100 mg/day.

Thirty days after the surgery, a duplex ultrasound was performed, which showed patency of the treated artery with a triphasic waveform observed in the common, superficial, and profunda femoral arteries, as well as in distal vessels. The surgical wound had healed, and there was no evidence of inflammation or infection.

Given the patient's clinical stability and their desire to proceed with the positioning of the penile prosthesis, the intervention has been

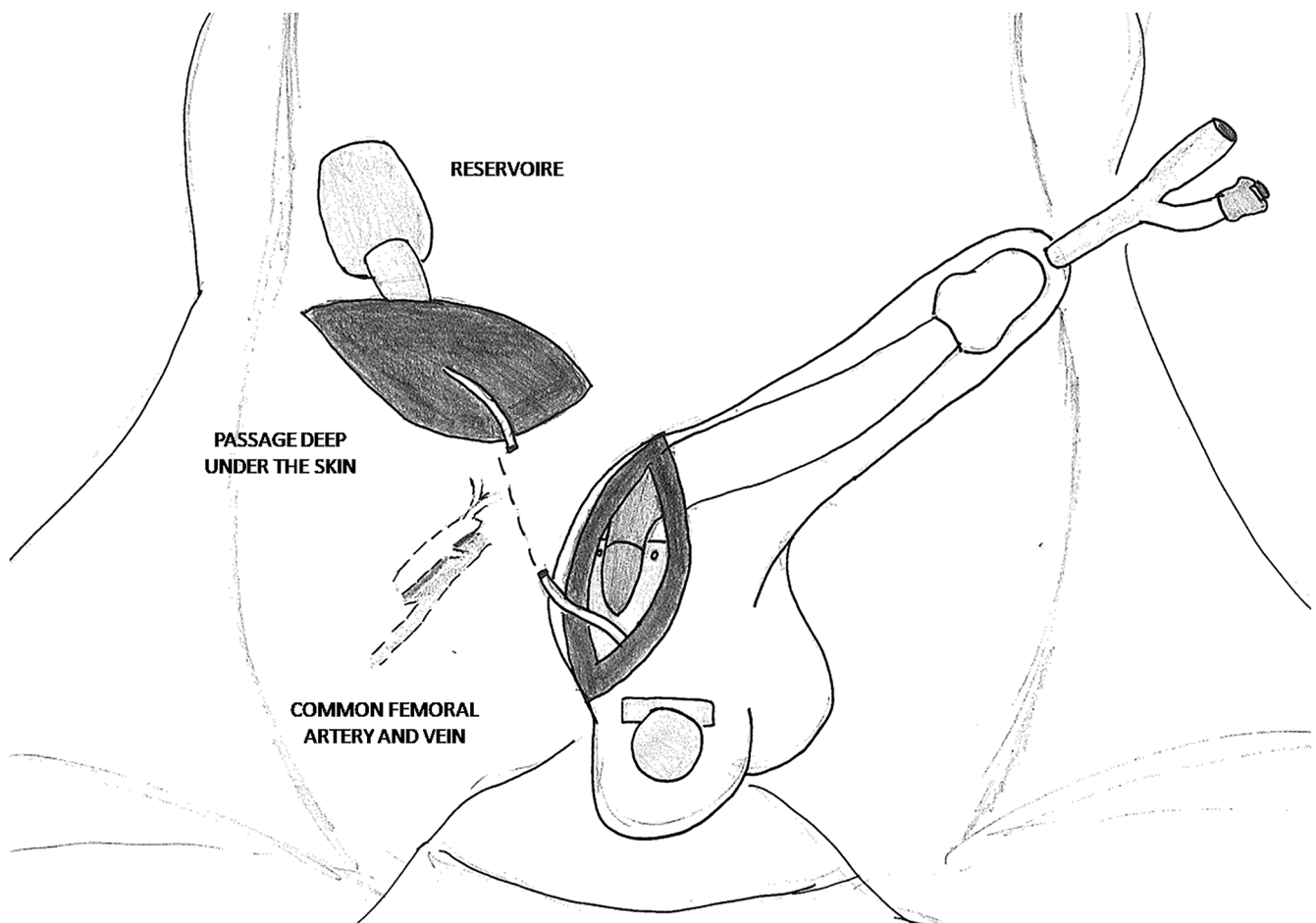


Fig. 1. Schematic representation of the indexed intervention.

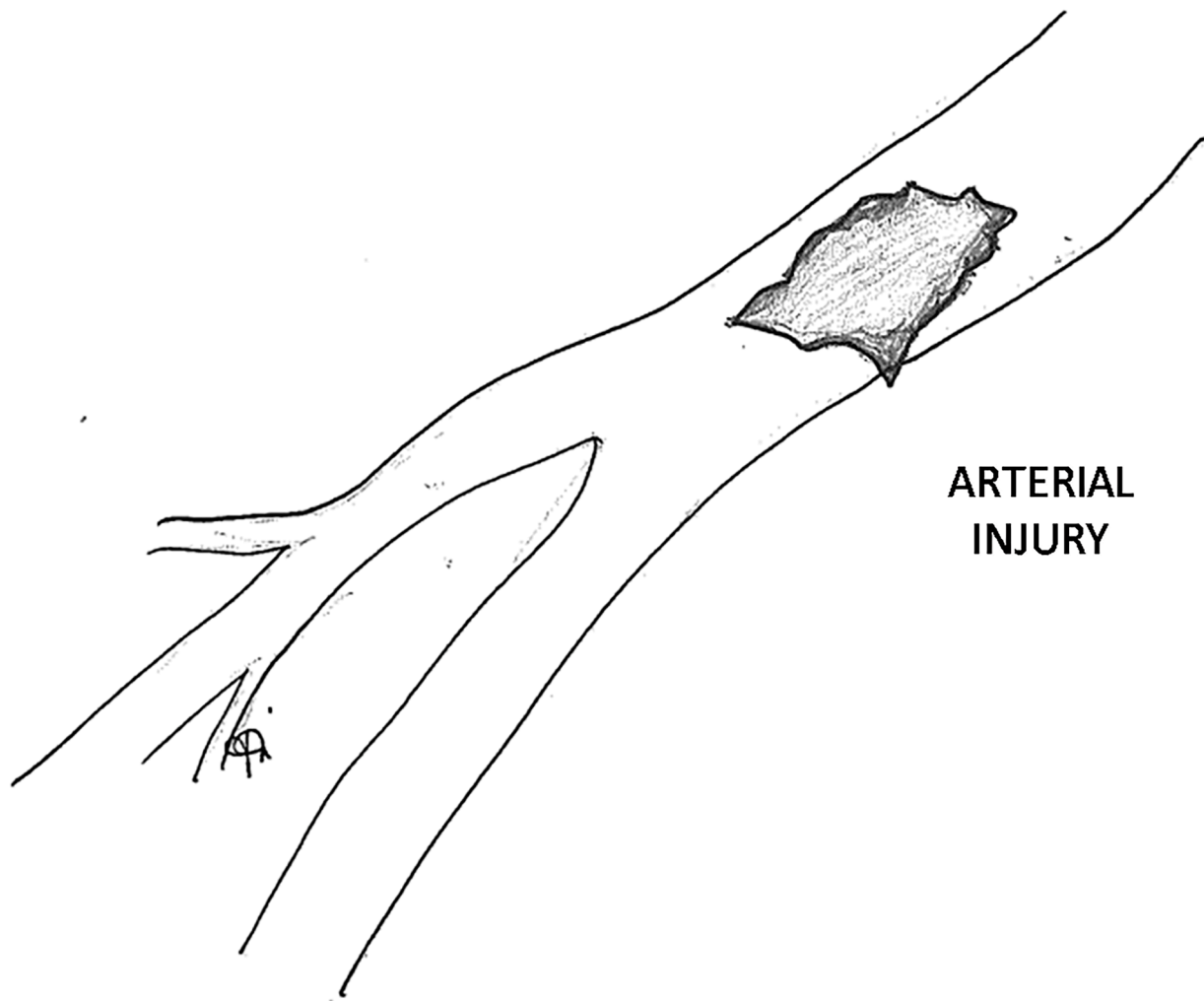


Fig. 2. Representation of the injury on the common femoral artery (Both are original drawings by Dr. Elena Giacomelli).

scheduled for the upcoming months. In agreement with the patient, a malleable single-component prosthesis will be used. This technique involves exclusively inserting the prosthesis inside the neophallus and does not require the passage of subfascial connection tubes

Discussion

The World Professional Association for Transgender Health recommends that female-to-male transgender genital reconstruction proceed according to the following criteria⁴:

1. Documented persistent gender dysphoria.
2. Capacity for informed consent.
3. Legal age attainment.
4. Control of significant medical or mental health concerns unless contraindicated.
5. Completion of 12 continuous months of hormone therapy, unless the patient is unwilling.
6. Living continuously for at least 12 months in the gender role congruent with their gender identity.

The majority of transgender men typically undergo hysterectomy and oophorectomy, procedures that also ensure the permanent cessation of menses. However, a significant percentage of individuals desire a complete male genital apparatus and, for this, undergo the placement of a penile prosthesis, which can have different configurations and consists

of various parts.

In this case, the patient opted for a complex prosthesis, which necessitated tunneling of connection tubes in the subfascial space and the inclusion of a reservoir. The literature contains limited reported cases of vascular complications during the placement of inflatable penile prostheses with reservoirs. These complications predominantly involve the venous system, with instances of external iliac vein or femoral vein compression leading to lower extremity edema, reduced venous flow, or deep venous thrombosis.^{2,4-8}

We are not aware of previous reports addressing arterial lesions, which are likely less frequent due to the lateral position of the femoral artery in relation to the vein. In our case, the intense fibrosis involving the subcutaneous tissues from previous interventions may have played a crucial role in this occurrence, given that no anomalies in position or course of the femoral were detected during the intervention.

In this case, primary repair of the arterial lesion was not possible due to the extent of the injury. Additionally, the arterial wall was unexpectedly frail and of poor quality, despite the patient's young age. Studies have demonstrated^{9,10} that hyperandrogenemia in women is associated with an increased risk of atherosclerosis and inflammation in the arterial wall. It can be hypothesized that prolonged testosterone treatment in our patient may have contributed to this arterial condition.

Despite this, reconstruction without the use of heterologous materials, which should be avoided in young patients, was still feasible. In our opinion, this case underscores the significance of preoperative vascular evaluation to detect any vascular anomalies and pre-existing

arterial diseases. It also emphasizes the necessity of performing this type of surgery in centers where a vascular surgery unit is readily available.

Conclusions

Given the increasing number of transgender individuals seeking gender-confirming surgery, surgeons will increasingly encounter complications from these procedures. Among them, arterial injuries, though rare, pose significant challenges for surgeons and can be life-threatening for patients. Considering the social and psychological difficulties faced by most of these patients, coupled with their high expectations for surgery, a multidisciplinary preoperative evaluation is crucial to prevent complications that could further impact their quality of life.

Patient consent statement

The patient provided written consent for the publication of this case report.

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CRediT authorship contribution statement

Elena Giacomelli: Writing – original draft, Supervision. **Marianna Peruffo:** Supervision, Conceptualization. **Andrea Cocci:** Writing – review & editing, Conceptualization. **Marta Pezzoli:** Writing – original draft, Data curation. **Raffaele Pulli:** Validation, Supervision. **Walter Dorigo:** Writing – review & editing, Validation, Supervision.

Declaration of competing interest

The authors certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript.

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