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Letter

Femoral artery blowout syndrome after inguinal lymphadenectomy for penile cancer



Dear Editor,

Inguinal lymphadenectomy represents a crucial step in both staging and treatment of penile cancer and can be curative in some patients. Nevertheless, severe morbidity can be high in up to 50% of cases. The most-reported complications are skin necrosis, wound infection, lymphoedema, and lymphocele [1].

In this setting, artery blowout syndrome (ABS) is a complication rarely described, presenting with vessels exposure through wound dehiscence, leading to arterial wall rupture with potentially life-threatening bleeding (Type III ABS). Reports have been described following radiation treatment of the groins or the neck [2,3]. We present the first case of femoral artery wall rupture with severe hemorrhage after iliac and inguinal lymphadenectomy for penile cancer in a patient without previous radiation treatment. Written consent for case publication was obtained.

A 68-year-old man was referred for an invasive penile cancer involving the entire shaft. Clinical examination showed a firm and bulky lymph node on the left groin (cN3). An abdominal magnetic resonance imaging confirmed a 1.5 cm left inguinal node. Past medical history included poorly controlled diabetes and severe obesity (body mass index 41 kg/m²). Perioperative cephalosporin-based prophylaxis was performed. Written informed consent for treatment was obtained. He underwent penile amputation, perineal urostomy, and concomitant bilateral ilioinguinal lymph node dissection through an abdominal incision 4 cm above and parallel to the inguinal ligament on each side (extended Gibson incision). Extraperitoneal pelvic lymphadenectomy included external iliac and obturator nodes bilaterally, including the Cloquet node. Drains were applied bilaterally in the groins and the iliac fossa. No intraoperative complications occurred. During the postoperative course, bilateral wound breakdown occurred, and on the

6th postoperative day, partial exposure of the right femoral artery wall was observed (Fig. 1). Active monitoring was decided. On the 7th postoperative day, right femoral ABS occurred with extensive bleeding. Immediate surgical repair was performed with autologous venous graft and sartorius muscle transposition. The patient lost about 2700 mL of blood perioperatively. Blood loss was estimated by measuring the blood in the suction bottle and gauze used to absorb the blood and blood clots. Intraoperative red blood cells transfusion was performed. Operative time was about 50 min. Postoperative antibiotic therapy targeted on wound culture with piperacillin-tazobactam was started. Complete wound healing required 43 days. Pathological examination showed pT3 pN3 squamous cell penile cancer. The patient died of pelvic relapse and metastatic distant spread to the lungs 6 months after surgery.

While the detailed mechanisms of ABS are still unclear, we hypothesized the following reasons in our case. The first step of femoral artery damage was its exposure following wound infection that is frequently observed in obese and diabetic patients [4]. In addition, skin necrosis might also be related to the surgical incision, which is particularly harmful in groins due to limited arterial bed, supported by superficial circumflex iliac artery and superficial epigastric artery [5]. To preserve these vessels, we adopted the extended Gibson incision sparing the Camper's fascia. Nevertheless, skin necrosis occurred, probably associated with the patient's anatomic vascular habitus or our surgical dissection. The second step of ABS pathogenesis was the development of arterial wall injury. Pathogenesis of arterial damage is commonly based on ischemia of the arterial wall layers correlated to vasa vasorum thrombosis due to infection. Furthermore, vessels susceptibility to ischemia is increased by the extension of the lymph node dissection, which leaves the artery without its supporting tissue [2]. Arterial wall injury leads gradually to a *locus minoris resistentiae* that causes artery breach when the damaged wall does not sustain its integrity against the patient's blood pressure. Moreover, in our patient, poorly controlled diabetes was an additional factor leading to further vasa vasorum damage.

Regarding ABS prevention, Schweitzer [6] suggested vessel protection at the time of lymphadenectomy through

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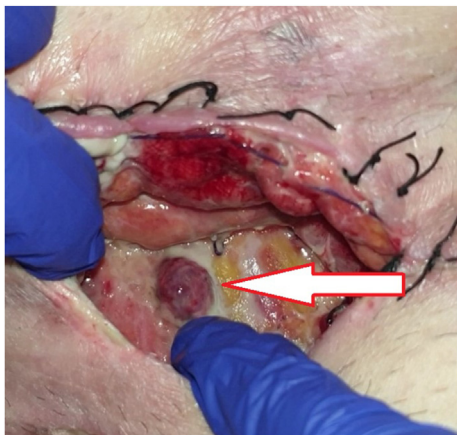


Figure 1 Wound breakdown during postoperative course. Red arrow pointing to exposed femoral artery wall.

sartorius muscle transposition or an abdominal wall flap. Thus, someone could correctly argue that prophylactic protection should have been planned in our patient following such an extensive dissection. Despite being a legitimate objection, current literature describes sartorius transposition as an adjunct risk factor for wound complication and it is not currently recommended by the European Association of Urology guidelines [4] to prevent ABS. Traditional open groin dissection has been associated with severe morbidity. Therefore, many modifications of the technique as “skin bridge”, “s-shaped”, or “elliptic incision” have been proposed but without significant benefits. However, minimally-invasive approaches, such as laparoscopic and robot-assisted surgery, have been recently proposed as alternative approaches to reduce surgical site complications. Encouraging results of minimally-invasive procedures are emerging from series of high-volume centers, with lower estimated blood loss, length of stay, and complications, still reporting a satisfying number of removed nodes [7–9]. However, due to the hypothetical high risk of metastatic spread and lack of long-term oncologic results for more aggressive disease, robotic and laparoscopic lymphadenectomy are recommended only in invasive lymph node staging (cN0) or, at most, in cN1 stage [10].

In conclusion, the present case is the first report of Type III femoral ABS occurred after groin dissection in a patient without previous radiotherapy. Surgical site infection and skin necrosis were the main factors leading to vessels exposure and arterial wall ischemia, erosion, and rupture, with obesity and poorly controlled diabetes as further predisposing factors. Mini-invasive surgery is presenting encouraging results about the prevention of these complications, even though only a small portion of properly selected patients is suitable for this approach in high-volume, tertiary referral centers.

Author contributions

Study design: Edoardo Agostini, Emanuele Gatta.

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Data Analysis: Edoardo Agostini, Eugenio Pretore, Simone Scarcella.

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Conflicts of interest

The authors declare no conflict of interest.

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