

CASE REPORT

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Endovascular treatment of femoral artery blow-out caused by skin malignancy

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Abstract

Background: Vascular blow-out syndrome is a life-threatening bleeding condition that usually occurs in the carotid arteries as a result of invasion of head and neck malignant tumors. There are several case reports in the literature on peripheral vascular blow out. To our knowledge, there is no other case report in the literature on blow-out in the femoral artery secondary to skin malignancy.

Case presentation: A 66-year-old male patient, who was diagnosed with skin squamous cell carcinoma (SCC) as a result of tissue sampling due to redness and stiffness in the left inguinal region, underwent emergency surgery with severe bleeding. Since edema and deformations on the skin did not render the operation possible, the patient was taken to the interventional radiology unit by applying pressure compression onto the bleeding area for urgent endovascular treatment. The patient was treated with a stent-graft.

Conclusion: The femoral blow-out is an emergency condition that needs to be managed aggressively, and if left untreated, it can cause serious bleeding, limb ischemia, limb loss, or death. Endovascular stent-graft placement is the first method that should be considered, and this method provides fast and effective treatment.

Keywords: Femoral artery, Vascular blow-out syndrome, Endovascular procedures, Stent-graft, Skin squamous cell carcinoma

Background

Vascular blow-out syndrome is a life-threatening bleeding condition that usually occurs in the carotid arteries as a result of invasion of head and neck malignant tumors, secondary to surgical treatment or radiotherapy administered for these tumors, or as a result of a combination of these factors, and also it may occur secondary to wound infections [1–3]. There are several case reports in the literature on peripheral vascular blow out, rarely in the femoral and iliac arteries secondary to colonic, anal, penile and vulvar malignancies [3–5]. However, there is no case report in the literature on blow-out in the femoral artery secondary to skin malignancy.

In this study, urgent endovascular treatment of acute blow-out complication in the superficial femoral artery due to squamous cell skin cancer in the left inguinal region is presented.

Case presentation

In March 2019, a 66-year-old male patient admitted to our hospital with the complaints of redness and stiffness in his left inguinal area. He was considered to have soft tissue infection and was received treatment for infection. However, his complaints did not improve, and upon the growth of his lesion, he admitted to our hospital again. Then, he was diagnosed as having skin squamous cell carcinoma as a result of tissue sampling for further examination. The patient, who received 6 cycles of chemotherapy (cisplatin, 5FU) and 5 cycles of radiotherapy, was hospitalized with complaints of ulcerated skin lesion and swelling in the left leg. On the patient's computed tomography, a mass with a size of 65 × 55 mm,

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which was closely adjacent to the common femoral and superficial femoral artery, was detected, causing marked deformation in the skin. Necrotic areas were observed in the center of the mass and inguinal metastatic lymphadenopathies were observed in the neighborhood (Fig. 1). In March 2020, the patient started bleeding in the subcutaneous region in the left inguinal area and from the open wound to the dermal surface. He underwent emergency surgery to control the bleeding. A total of 5 RBC units were transfused before and during the operation. Since edema and deformations on the skin did not render the operation possible, the patient was taken to the interventional radiology unit by applying pressure compression onto the bleeding area for urgent endovascular treatment.

Endovascular technique

The patient, who had active bleeding in the left inguinal region, was accessed from the right common femoral artery under aseptic measures and general anesthesia. The left main iliac artery and then the external iliac artery were reached with the help of a cobra catheter and hydrophilic wire. Angiography images obtained without removing compression as the patient had abundant bleeding and he was vitally unstable, showed pseudoaneurysm in the left common femoral artery, and no contrast material passage was observed beyond this level (Fig. 2A). The long vascular sheath was placed in the left external iliac artery without removing the compression, and the distal part of the left superficial femoral artery was reached by passing the bleeding site with a 0.035 inch straight tip hydrophilic wire. A 7 × 100 mm Viabahn stent-graft was advanced to the bleeding level over the wire. To obtain an image, the pressure in the left inguinal area was removed, and abundant extravasation was confirmed on the images obtained (Fig. 2B), and the stent-graft present at this level



Fig. 1 Axial contrast-enhanced CT image of the patient shows mass in the left inguinal region invading left superficial femoral artery

was opened immediately. After this step, it was observed that extravasation stopped completely and flow was provided in the superficial femoral artery (Fig. 2 C). The patient was prescribed daily 75 mg clopidogrel for three months and daily 100 mg acetylsalicylic acid lifelong to maintain stent patency. Stent-graft was patent during the patient's 6-month follow-up.

Informed consent has been obtained from the patient for publication of the case report and accompanying images.

Discussion

Vascular blow-out syndrome is a life-threatening condition consisting of carotid artery rupture, usually secondary to direct tumor involvement in advanced head and neck cancers, which is rarely described in the peripheral circulation [6]. In this study, a case of peripheral blow-out at a rare site and its endovascular treatment under emergency conditions are presented. In the literature, no case of femoral artery blow-out due to squamous cell carcinoma of the skin has been reported.

There are several case reports of femoral blow-out that were treated with repair of the rupture in the vessel by urgent surgery and then treated with plastic reconstruction [5]. In an ulcerated, edematous and infected area, traditional open surgery carries a risk of poor wound healing in these patients who also have other serious illnesses. Also, curative surgery is not possible in an advanced malignancy environment. Considering the general condition of the patient, a major surgery including vascular reconstruction and extensive excision is required. Instead, in recent years, the minimally invasive endovascular approach, including major vascular occlusion, embolization of vascular damage, or placement of a covered stent, has become an effective alternative to open surgery in these high-risk patients. Endovascular treatment controls bleeding with high success and low complication rates, and minimal ischemic injury has occurred due to the procedure [3, 6].

Stent-grafts are widely used with high success in emergency endovascular treatments including trauma and bleeding of various arterial lesions in the body [7]. Polytetrafluoroethylene coated nitinol stent grafts (Gore Viabahn and Bard Fluency) are the most commonly used coated stents [8, 9]. They are placed to cover the damaged part of the artery to repair the vascular wall. Stent-grafts also have their own complications. These can be counted as stent occlusion, deformation, intimal hyperplasia and loss of branches. The most prominent complication among these is occlusion, which is reported in the literature at a rate of approximately 17% [10]. Balloon expandable stent-grafts provide more accurate positioning and size selection, but are more prone to deformation and



Fig. 2 **A** Digital subtraction angiography image of left inguinal region with compression shows pseudoaneurysm in the left main femoral artery, and no contrast material passage was observed beyond this level. **B** Digital subtraction angiography image of left inguinal region without compression shows abundant extravasation. **C** Native and digital subtraction angiography image after stent-graft replacement shows no residual extravasation and patent flow in the superficial femoral artery

crushing [11]. Self-expandable stent-grafts are more flexible and more resistant to crushing with external forces. For this reason, self expandable stent grafts should be preferred in the main femoral artery, which is the joint region as in our patient, and in carotid artery lesions, which have a superficial localization [11]. In addition, self-expandable stent-grafts should be preferred when a longer grip area is required in the vessel [7]. After stent placement, instent balloon angioplasty may be necessary to increase the diameter of the stent and to ensure that the graft fits tightly to the artery wall [12].

In the treatment of an active bleeding secondary to iatrogenic, traumatic or spontaneous arterial lesions at the

level of an important vascular structure such as the common femoral artery, the primary goal is always the preservation of the parent artery. In such large vessels, the use of a stent graft should be the first choice in order to protect the outflow in cases where the bleeding point can be passed by the guidewire and a healthy lumen can be reached distally [7]. In cases where the patent lumen distal to the hemorrhage cannot be reached, parent artery occlusion emerges as another endovascular treatment option for life-threatening hemorrhage control.

Stent occlusion is one of the main complication encountered during follow up. Dual antiplatelet therapy is recommended after treatment of non-traumatic

peripheral arterial occlusion or stenosis with stent graft. However, optimal antiplatelet therapy in patients with active bleeding treated by using stent graft is not clear [13]. In a meta-analysis, it was reported that in all studies it was recommended that patients should use at least one antiplatelet agent, ranging durations from 3 months to lifelong [14].

Conclusion

The femoral blow-out is an emergency condition that needs to be managed aggressively, and if left untreated, it can cause serious bleeding, limb ischemia, limb loss, or death. When these patients present with abundant bleeding, endovascularly placed stent-graft is the first method that should come to mind, and this method provides treatment quickly and effectively. However, long-term patency of stent-grafts is controversial, especially when used in localizations such as joint areas. It is also a controversial issue whether antiaggregant therapy, which should be started and used for lifelong time after stent-graft placement in order to maintain stent patency, can be used in patients with malignancy who are prone to bleeding as our patient, and in trauma patients.

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Authors' contributions

This study was directed and coordinated by AH, Design of the study was by OE, Literature search was suggested and executed by EB, The manuscript was written by AH and SB and commented on by all authors. The authors read and approved the final manuscript.

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Declarations

Ethics approval and consent to participate

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Consent for publication

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Competing interests

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