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## False aneurysm of deep femoral artery branch following blunt trauma

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### Summary

<b>Background:</b>	Pseudoaneurysms of the deep femoral artery (DFA) as a result of blunt trauma are very rare, therefore they are often not suspected. Surgery remains the treatment of choice and should be carried out electively for asymptomatic aneurysms. The stent-graft placement is another way of treatment but long-term durability of DFA stentgrafting is still unknown.
<b>Case Report:</b>	We present a case of a 20-year-old male patient with a pseudoaneurysm of DFA as a result of blunt trauma which was successfully treated with a stengraft.
<b>Conclusions:</b>	A pseudoaneurysm should be suspected in any patient presenting with an enlarging haematoma following blunt trauma. The use of stent-grafts seems to be a safe and efficient way of treatment of post traumatic DFA pseudoaneurysms and should be considered as one of treatment options.
<b>Key words:</b>	<b>ENG deep femoral artery pseudoaneurysm • endovascular treatment • blunt trauma of the artery</b>
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### Background

Femoral artery pseudoaneurysms are most often seen in the setting of previous femoral artery catheterization but may also be associated with a trauma, anastomotic leakage, or an infection [1]. False aneurysms of deep femoral artery (DFA) are not suspected when a patient sustained blunt trauma without femoral fracture. The majority of femoral pseudoaneurysms less than 3 cm in diameter may undergo spontaneous embolization, but in some cases may cause serious complications such as thromboembolism or rupture [2]. The diagnosis is difficult but it may be suggested by the presence of a pulsatile tumor in the region of the femoral artery or a large hematoma [3].

We report a case of a young patient with a false aneurysm of the deep femoral artery, which was successfully excluded from circulation with a stent-graft.

### Case Report

A 20-year-old male presented with an enlarging painful tumor and a hematoma in his right thigh. He had a history

of being kicked in the groin area during a football match one month previously. An ultrasound examination revealed a hematoma and a pseudoaneurysm of the DFA. The arteriogram performed via the left femoral artery approach confirmed a neckless pseudoaneurysm about 70×40mm in size with a wide origin and a hematoma causing modeling of the DFA (Figure 1). Endovascular stent-graft placement was chosen to preserve blood flow through the DFA due to young age of the patient.

Endovascular access was obtained under local anesthesia from a retrograde approach with the use of cross-over technique. A bolus of 5000 IU of heparin was given intravenously. The 0.035" hydrophilic guidewire (Terumo, Tokyo, Japan) was placed into the DFA, followed by the placement of a 10F introducer sheath (Cordis, Warren, NJ) and the pseudoaneurysm was carefully crossed. Over the hydrophilic guidewire, a 4F catheter was advanced into the DFA and the hydrophilic guidewire was replaced with 0.035" diagnostic guidewire (Emerald, 0.035" Cordis Johnson&Johnson). A 7×30 mm self-expanding stent-graft (Wallgraft, Boston Scientific, Watertown, MA) was deployed across the site of the pseudoaneurysm. Control angiogram showed complete



**Figure 1.** Angiography presenting a pseudoaneurysm of the deep femoral artery.

exclusion of the pseudoaneurysm (Figures 2,3). The guide-wire and the introducing sheath were removed and hemostasis was achieved with the use of an endovascular suture (Prostar XL 10F, Abbot Vascular Germany).

The operation time was 40 minutes. There were no post-operative complications and the patient was discharged on 2<sup>nd</sup> postoperative day. The patient has been followed up for three years, with ultrasound examinations performed every 6 months, and next once yearly; the examinations have revealed no complications.

## Discussion

Pseudoaneurysms of the deep femoral artery (DFA) as a result of blunt trauma are very rare, therefore they are often not suspected. In some cases false aneurysms were initially missed because hematomas masked the underlying pulsation. Treatment with incision and drainage in A&E department led to massive arterial bleeding. In our patient, there was no pulsation, but clinical awareness and confirmation with an ultrasound examination led to a correct diagnosis.

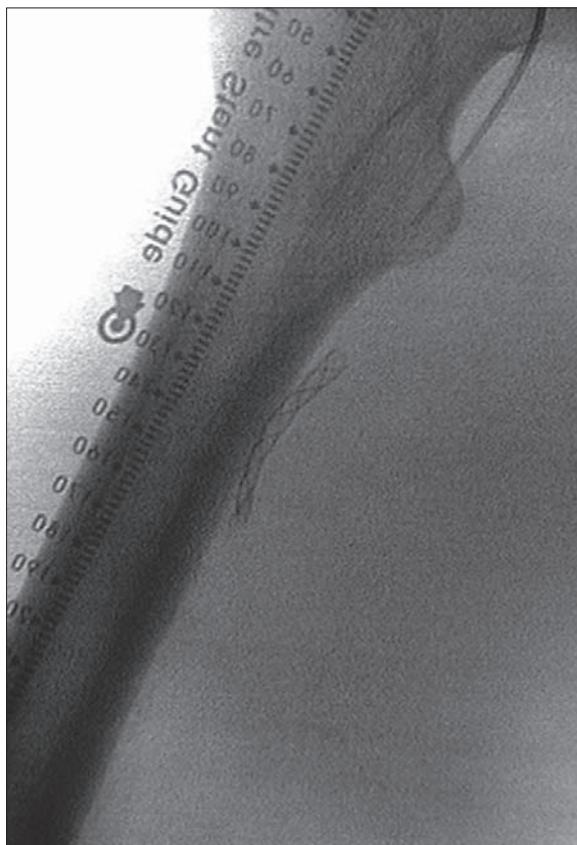
Peripheral true and false aneurysms can be treated with surgical or interventional radiology procedure such as covered stent placement, transcatheter embolization, ultrasound-guided compression, or thrombin injection [4]. The treatment of DFA pseudoaneurysms depends on their



**Figure 2.** Control angiogram showing complete exclusion of the pseudoaneurysm and preserved flow through the stent-graft.

anatomy and morphology as well. Surgery remains the treatment of choice and should be carried out electively for asymptomatic aneurysms [5]. Open repair in an emergency case can be challenging, especially when it involves vascular reconstruction as dictated by the peripheral vascular circulation [1,6,7]. In our patient, the pseudoaneurysm originated from a major DFA branch, therefore we could choose between surgical or endovascular treatment. Catheter embolization of an aneurysm with a wide neck is connected with a higher risk of embolic complications [8]. The patient's age made saving the patency of the DFA the most important issue. The stent-graft placement into a femoral aneurysm seems to be a safe and efficient way of treatment with 96% technical success and over 90% efficiency in 60-month follow-up but the long-term durability of DFA stentgrafting is still unknown [9]. This less invasive method should not be used in a child patient, in whom open surgical treatment with autogenous conduits is recommended [10].

Stentgrafting advantages over surgery repair include decreased morbidity, reduced procedure time, less blood



**Figure 3.** Plain X-ray with well visible stent-graft structure.

loss and shortening of the recovery time. Due to the young age of the patient, the possibility of long-term complications, such as late aneurysmal growth, stent occlusion, infection and deformation should be taken into account [2,11]. There are only several reports of long-term follow-up of stent-graft placement in patients under 30 [10,11]. Careful follow-up consists of ultrasound and angioCT examinations or angiography in case of any complications.

## Conclusions

In any patient presenting with an enlarging hematoma following blunt trauma, a pseudoaneurysm should be suspected and an ultrasound examination performed. The use of stent-grafts seems to be a safe and efficient way of treatment of post-traumatic DFA pseudoaneurysms and should be considered as one of treatment options. The possibility of complications must be taken into account, especially when a young patient is treated, and carefully follow-up is necessary.

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