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Endovascular Repair of a Popliteal Artery Pseudoaneurysm Following Total Knee Arthroplasty

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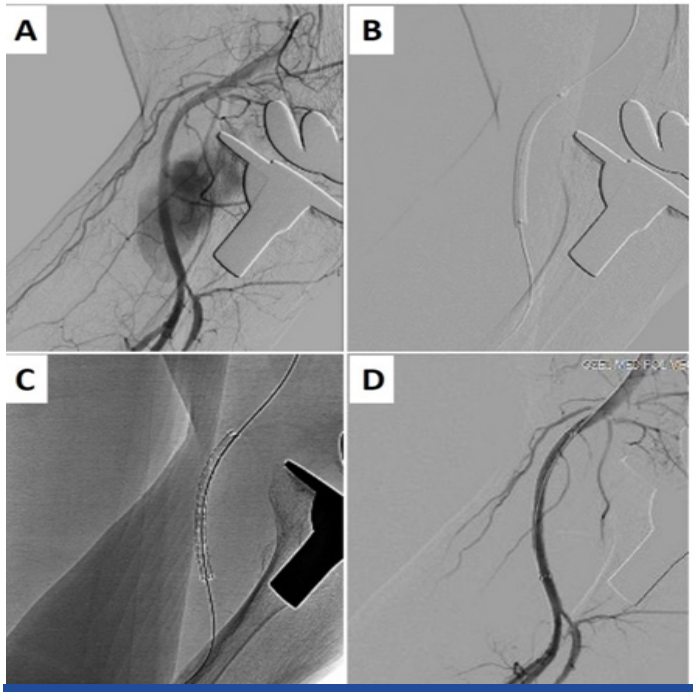
A 68-year-old man was referred for a pulsatile and painful mass at the left popliteal fossa. He had gonarthrosis that was treated with total knee arthroplasty three months ago. Postoperatively, the patient had prolonged knee haemarthrosis that caused semi-flexion contracture of the knee joint. An ultrasound examination with Doppler analysis revealed a pseudoaneurysm of the popliteal artery with a size of 5x7 cm occupying the entire popliteal fossa. Orthopedics consultation confirmed the diagnosis of intraoperative vascular injury. Endovascular therapy was planned due to the high risk of prosthesis infection with re-operation. The procedure was initiated by placing a 6F arterial sheath in the right femoral artery followed by advancing a hydrophilic guide wire to the contralateral lower limb. A JR Diagnostic Catheter was used to perform digital subtraction angiography (DSA) that demonstrated the leakage of blood flow forming a huge popliteal pseudoaneurysm [Table/Fig-1a] [Video-1]. Popliteal artery was also seen to be compressed by the aneurysmal sac proximally. The hydrophilic guide wire was exchanged with a stiff guide wire for better support during the procedure. Firstly, a 5.0 x 60 mm balloon (Admiral Xtreme, Medtronic, USA) was inflated at nominal pressure to achieve spontaneous closure of the pseudoaneurysm [Table/Fig-1b]. Despite 10 minutes of prolonged balloon inflation, DSA showed that pseudoaneurysm persisted without any improvement of its size. Subsequently, a 6.0 x 60 mm self-expandable stent graft (Fluency Plus, BARD, USA) was implanted covering both the pseudoaneurysm and the narrowed segment of the popliteal artery [Table/Fig-1c]. The neck of the pseudoaneurysm was seen to be closed without any residual leakage into the sac with a good distal flow as shown by control DSA [Table/Fig-1d], [Video 2]. The procedure was completed uneventfully provided that the patient remained asymptomatic during the early follow-up period.



[Table/Fig-1]: Digital subtraction angiography (DSA) image demonstrating the leakage of blood flow at the popliteal level forming a huge pseudoaneurysm (5 x 7cm)
[Table/Fig-1b]: Location of the 5.0 x 60 mm balloon (Admiral Xtreme, Medtronic, USA)in order to achieve spontaneous closure of the pseudoaneurysm by long-time inflation
[Table/Fig-1c]: Location of the 6.0 x 60 mm self-expandable stent graft (Fluency Plus, BARD, USA) covering both the pseudoaneurysm and the narrowed segment of the popliteal artery
[Table/Fig-1d]: DSA image showing successful closure of the pseudoaneurysm neck with a good distal flow after stent implantation

Popliteal artery pseudoaneurysms due to the vascular injury during knee arthroplasty is a relatively rare complication that occurs most commonly during resection of the proximal tibia with an oscillating saw [1]. Although CT angiography is the gold standard for the accurate diagnosis, an arterial Doppler ultrasonography is usually cost-effective to detect a pseudoaneursym [2]. Percutaneous treatment with endovascular stenting may be a reliable alternative of surgical intervention due to the high risk of prosthesis infection with re-operation [3].

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