Popliteal Artery Pseudoaneurysm Following Blunt Knee Trauma—A Case Report
Chandrasekharan Sukumaran, M.P. Sreejayan, R. Priya, P. Preetha

Department of General Surgery, Government Medical College, Calicut, Kerala State, India
Corresponding author email: c_sekhardr@yahoo.co.in


Received: 29 Aug., 2013
Accepted: 30 Aug., 2013
Published: 30 Aug., 2013
Copyright: © 2013 Sukumaran et al., This is an open access article published under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Abstract
Pseudoaneurysms of the popliteal artery arising from blunt knee trauma is an exceedingly rare condition and to our knowledge only less than 20 cases have been reported so far. We present the case of a 72 year old lady who presented with painful pulsatile swelling left popliteal fossa. Investigations revealed a large pseudoaneurysm of the left popliteal artery. She was treated by aneurysmectomy and reconstruction with an interposition PTFE graft. We are reporting this case for the rarity of its occurrence and because the possibility of such a pathology should be kept in mind when evaluating popliteal fossa swellings.

Keywords
Pseudoaneurysm, Popliteal artery, Blunt trauma

1 Background
Pseudo- or false aneurysms are localized dilatations of an artery where there is a contained rupture through the two innermost layers of the vessel wall. Although popliteal artery is the commonest site of peripheral arterial aneurysm, most of the reported cases are true aneurysms (Vermilion et al., 1981; Bouhoutsos and Martin, 1974; Szilagyi et al., 1981). Because the popliteal fossa is a well-protected region, pseudoaneurysms are uncommon in this region. Most of the pseudoaneurysms reported in the civilian setting are secondary to penetrating trauma or iatrogenic injuries. The occurrence of pseudoaneurysms following blunt popliteal trauma is exceedingly rare and only less than 20 cases have been reported so far (Radford, 2001; D’Angelo et al., 2007; Ozisik et al., 2003; Woolgar et al., 2002).

2 Case summary
We present the case of a 72 year old female who presented to us with pain and swelling of the left popliteal region of 4 months duration. There was a history of 2 episodes of fall from stairs with subsequent hyperextension of the knee. The first episode was 11 months back and the second one was 7 months back. On clinical examination she had a pulsatile, tender swelling in the left popliteal fossa with normal peripheral pulses. Orthopedic examination revealed a very unstable knee with knee joint effusion. Arterial duplex reported a large pseudoaneurysm arising from the popliteal artery with a wide neck of 3 cms. Magnetic resonance angiography revealed a 7 cm × 6 cm × 4 cm pseudoaneurysm arising from the left popliteal artery with accompanying knee joint effusion. Her rheumatologic workup was normal. She underwent aneurysmectomy and reconstruction with an interposition 5 mm polytetrafluoroethylene graft.

Saphenous vein quality was very poor and hence an autologous vein graft was not considered. In view of the unstable nature of her knee and considering her age, an arthrodesis was performed in order to prevent future dislocations. Her post-operative period was uneventful. She had normal peripheral pulses following surgery.
3 Discussion
Pseudoaneurysm of the popliteal artery may be secondary to several factors, trauma being the predominant cause. Several mechanisms of trauma are involved. Penetrating traumas due to stab wounds or gunshot wounds, femoral or tibial fractures or fracture/subluxation and iatrogenic injuries account for more than 90% of popliteal artery pseudoaneurysms. Blunt trauma in the form of traffic accidents resulting in dislocations around the knee joint is a less common cause of popliteal pseudoaneurysm (Megalopoulos et al., 2006).

Blunt trauma without fractures or dislocations seldom lead to pseudoaneurysms, given that only a great mechanical force can cause trauma to the popliteal artery. The popliteal fossa is surrounded by highly resistant structures of muscles and bones and thus a mild trauma rarely leads to arterial damage without damaging surrounding structures. One such injury is a typical hyperextension injury of the knee sustained during falls on the buttocks (Ge et al., 2010). Also structural alterations on the arterial wall, such as those caused by collagen or connective tissue diseases and by arteritis secondary to septic embolism in patients with infective endocarditis can rarely cause popliteal pseudoaneurysm formation. Such diseases invariably lead to structural damage, weaken the arterial wall and make the artery more vulnerable to spontaneous ruptures or ruptures due to mild traumas. The problem with this type of injury is that they tend to be neglected because of the trivial nature of the incident and hence tend to present late. Most of these injuries tend to present late as painful swellings in the popliteal fossa typically two to three years after the primary insult (Megalopoulos et al., 2006). Because the injury is a partial arterial injury peripheral pulses are preserved in the initial phase of the injury. However subsequently the aneurysmal lumen and hence distal outflow undergoes thrombosis with consequent danger of limb loss untreated pseudoaneurysms tend to be associated with a high incidence of complications which include thromboembolism, rupture and compression on popliteal vein and tibioperoneal nerves. The accompanying risk of limb loss is hence very high (Gillespie and Cantelmo, 1991; Ge et al., 2010).

Diagnosis is usually made by an arterial duplex ultrasonography. A magnetic resonance angiography helps in procuring the details required for surgical planning.

Management options are either an aneurysmectomy with end to end anastomosis using an interposition graft or an aneurysm exclusion and bypass. A reversed great saphenous or short saphenous vein graft is commonly used to restore arterial continuity. If the patient does not have an autologous vein of adequate caliber, then a prosthetic graft (Dacron or PTFE) is preferred. Any accompanying orthopedic intervention may be done either simultaneously or after 6 to 8 weeks once the anastomosis has matured.

In conclusion popliteal artery pseudoaneurysms should be included in the differential diagnosis of all popliteal fossa swellings. The absence of a history of major trauma or the lack of absence of peripheral pulses does not rule out the presence of an aneurysm. Because of the consequences associated with delayed treatment, these lesions should be diagnosed and treated as early as possible.

Authors’ contribution
All authors contributed significantly in drafting the manuscript. The four authors have read and approved the final manuscript.

References
artery pseudoaneurysm: Case report and review of the
literature, J. Trauma., 31(3): 412-415 PMID: 2002532
Megalopoulos A., Siminas S., and Trelopoulos G., 2006,
Traumatic pseudoaneurysm of the popliteal artery after
blunt trauma: Case report and a review of the literature,
Ozisik K., Dural K., Okcu O., Han S., Yildirim E., and Sakinci
U., 2003, Pseudoaneurysms of the popliteal and
tibioperoneal arteries after gunshot injuries, J. Trauma.,
55(3): 485-488 PMID: 14501891
Radford D.J., 2001, Traumatic false aneurysm in the popliteal
artery of a child, Med. J. Aust., 175(11-12): 658
arterial aneurysms, Arch. Surg., 116: 724-728
Vermilion B.D., Kimmins S.A., Pace W.G., and Evans W.E.,
1981, A review of one hundred and forty-seven popliteal
aneurysms with long term follow up, Surgery, 90(6):
1009-1014 PMID: 6458912
presentation of traumatic popliteal artery pseudoaneurysms:
Surg., 23(3): 255-259 PMID: 11914014