Distal posterior tibial artery pseudoaneurysm after fracture calcaneus

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Received: 16 June 2008 / Accepted: 19 June 2008

Abstract Here we report a case of pseudoaneurysm of distal posterior tibial artery following closed fracture of calcaneus. Association of pseudoaneurysm of posterior tibial artery with fracture of calcaneus is extremely uncommon. It is always suggested that pseudoaneurysm be treated by reconstruction, but here we present the case treated by ligation, obliteration and excision as it was situated distally and the plantar arch circulation was maintained. The purpose of this case report is to bring attention to this complication of vascular trauma, which may cause delayed symptoms long time after the injury as well as the rare incidence of posterior tibial artery involvement with fracture calcaneus.

Keywords Fracture Calcaneus · Pseudoaneurysm · Posterior Tibial Artery

Introduction

Pseudoaneurysm of tibial arteries is infrequent. Here we report a case of pseudoaneurysm of distal posterior tibial artery following closed fracture of calcaneus. Association of pseudoaneurysm of posterior tibial artery with fracture of calcaneus is extremely uncommon. The case was diagnosed after more than four weeks of the initial injury by MRI & Colour Doppler studies. It is always suggested that this condition be treated by reconstruction, but here we present the case treated by ligation, obliteration and excision as it was situated distally and the plantar arch circulation was maintained. The purpose of this case report is to bring attention to this complication of vascular trauma, which may cause delayed symptoms long time after the injury as well as the rare incidence of posterior tibial artery involvement with fracture calcaneus.

Case report

A 48-years-old Buddhist monk presented to us on in early 2004 with history pulsatile and progressively increasing swelling on the medial aspect of left ankle of two months duration. The swelling was preceded by a fall from height around three months back leading to fracture of left calcaneus. He was treated elsewhere and noticed the swelling after the plaster cast was removed.

On examination the swelling was found to be globular, 6 × 5 cm in size, situated on the postero-medial aspect of the left medial malleolus, with no local rise in temperature, soft, cystic, fluctuant, partially compressible, with expansile pulsation, skin over the swelling was normal and all margins could be felt except on the antero-superior aspect. Proximal posterior tibial, dorsalis pedis pulsations were felt and capillary filling time was normal.

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Investigations like hemogram, renal profile, blood sugar, electrocardiogram and skiagram of chest were all within normal limits.

MRI of left ankle and calcaneus revealed hypo intense image on *T1* and mixed intensity on *T2* and *Tse* images suggestive of sclerosis over the calcaneus and a well defined area on medial aspect of left ankle appearing heterogeneous on *T1* weighted image and peripheral hyper density with central hypo intensity on *T2* and *Tse* sequences consistent with features of old fracture of calcaneus and a pseudo aneurysm on the medial aspect of the ankle.

Colour Doppler study of posterior tibial artery revealed a well defined cystic pulsatile mass on the medial aspect of medial malleolus approx $4 \times 2.4 \times 4$ cm in size having central anechoic areas and irregularly thick wall. Typical *whirl pattern* of flow was seen in anechoic part. Peripheral thick wall was due to thrombus. The main vessel feeding the mass was posterior tibial artery.

Diagnosis of pseudoaneurysm of posterior tibial artery was made and patient was prepared for operative intervention.

Patient was operated upon after 2 days of presentation under spinal anesthesia. After preparing the part with 5% povidone iodine solution and draping, a curved incision was made over the swelling and dissection done to expose the fibrous sheath by raising skin flaps. Proximal posterior tibial artery was skeletonised and controlled with 'bulldog clamp' (Fig. 1)

Aneurysm was opened and about 30 ml of clots taken out. Proximal feeding vessels were ligated with 3/0 silk sutures. Aneurysmal sac excised and sutured to obliterate the cavity as much as possible. Hemostasis was ensured, skin repaired with interrupted silk sutures and a pressure bandage was applied. Patient was discharged on 28/04/04 on oral anti-inflammatory medications and was reviewed on 06/05/04 as an outpatient; the cutaneous sutures were removed on the same day. The patient has been followed up every six months and has been asymptomatic till date.

Fig. 1 Operative picture of proximal posterior tibial artery

Discussions and conclusions

Till 1995 only 11 civilian cases of pseudoaneurysm following fractures of long bones of leg were reported in world literature [1]. The association with fracture of calcaneus seems even rarer, as an extensive electronic search of world literature revealed only two published case reports [2–3]. Traumatic arterial injuries can be classified as a) complete transection, b) partial tear or c) intimal tear. Pseudoaneurysms frequently occur following partial laceration of wall of an artery [4]. It should be operated upon as soon as diagnosis is made to prevent inevitable complications like progressive increase in size, pressure symptoms or rupture. Intraoperatively the aneurysm is opened, contents evacuated and sac obliterated and excised and the artery maybe ligated, if the artery is not essential for normal circulation [5] as was evident in the present case. However if the sole artery is essential, reconstructive procedures are needed. Endovascular treatment like sonographically guided thrombin injection [6] is also an alternative mode of treating such aneurysms.

The presently reported pseudoaneurysm was probably caused due to entrapment and partial laceration of the posterior tibial wall, within the compressed fracture fragments of the calcaneus. We would like to emphasise that vascular injuries need to be kept in mind and considered in all bony fractures. And pseudoaneurysms are known to manifest even upto six months after the initial injury. Vascular reconstruction is required where the sole affected artery is essential for normal circulation, otherwise ligation and excision is an equally effective alternative as demonstrated in the present case.

References

1. Guiral J, Vazquez P, Ortega M (1995) False aneurysm of the posterior tibial artery complicating fracture of the tibia and fibula. *Rev Chir Orthop Reparatrice Appar Mot* 81(6):546–548 http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=ShowDetailView&TermToSearch=8560025&ordinalpos=39&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum (Accessed on 11 September 2007)
2. Aiyer S, Thakkar CJ, Samant PD, Verlekar S, Nirawane R (2005) Pseudoaneurysm of the posterior tibial artery following a closed fracture of the calcaneus. A case report. *J Bone Joint Surg Am* 87(10):2308–2312 http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=ShowDetailView&TermToSearch=16203898&ordinalpos=5&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum (Accessed on 11 September 2007)
3. Edwards P, Kurth L (1992) Posterior tibial pseudoaneurysm after calcaneus fracture: a case report. *Foot Ankle* 13(2):93–95 http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=ShowDetailView&TermToSearch=1572592&ordinalpos=48&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum (Accessed on 11 September 2007)

4. David C Sabiston, Jr, editor (1991) Textbook of surgery: the biological basis of modern surgical practice. 14th edition. W B Saunders Company: Philadelphia pp. 1612–1614
5. R. F. Rintoul, editor (1986) Farquharson's textbook of operative surgery. 7th edition. Churchill Livingstone: Edinburgh pp. 41–42
6. Rocco Corso, Gianpaolo Carrafiello, Marcello Intotero, Marco Solcia (2003) Large Iatrogenic Pseudoaneurysm of the Posterior Tibial Artery Treated with Sonographically Guided Thrombin Injection. *AJR* 180:1479–1480 <http://www.ajronline.org/cgi/reprint/180/5/1479> (Accessed on 11 September 2007)