SHORT REPORT

Post-traumatic Pelvic Pseudoaneurysm and Arterio-venous Fistula: Combined Endovascular and Surgical Approach

N. Papadakos a, L. Wales a, K. Hayes b, A.-M. Belli c, I. Loftus a, S. Ray a

a St. George’s Vascular Institute, London, UK
b Department of Obstetrics and Gynaecology, St. George’s Hospital, London, UK
c Department of Interventional Radiology, St. George’s Hospital, London, UK

Submitted 28 December 2007; accepted 29 March 2008
Available online 3 June 2008

KEYWORDS
Pelvic pseudoaneurysm; Arterio-venous fistula; Endovascular technique

Abstract Post-traumatic pelvic pseudoaneurysms are rare and challenging to manage. We describe the combined endovascular and surgical strategy used, to successfully treat a large internal iliac pelvic pseudoaneurysm combined with arterio-venous fistula, in a patient presenting 20 years following an elective caesarean section.

© 2008 European Society for Vascular Surgery. Published by Elsevier Ltd. All rights reserved.

doi:10.1016/j.ejvs.2008.03.011

Introduction

Post-traumatic pelvic pseudoaneurysms and arterio-venous fistulae occurring after gynaecological surgery, difficult labours or large babies have been well documented in the past.1 Historically, surgery has been the intervention of choice, but presents technical difficulties and can be associated with massive blood loss.2 Recent advancements in endovascular techniques can now be used to facilitate surgical resection and reduce peri-operative blood loss.3 We describe a combined endovascular and surgical strategy used to treat a large post-traumatic pelvic pseudoaneurysm in combination with an arterio-venous fistula.

Report

A 57-year-old female initially presented to the gynaecology team in a peripheral hospital, with a two-month history of right iliac fossa pain. She had a history of elective caesarean section 20 years previously. An ultrasound identified a fluid-filled pelvic mass measuring $8 \times 9 \text{ cm}$ and a diagnostic laparoscopy was performed to clarify the aetiology of the mass. At laparoscopy, the mass was identified as a pelvic pseudoaneurysm and a tertiary referral was made to the vascular unit for further management.

CT scan confirmed the presence of a 9 cm right pelvic pseudoaneurysm, (Fig. 1A), separate from adjacent pelvic
organs. At diagnostic angiography, the pseudoaneurysm appeared to be arising from the right internal iliac artery (Fig. 1B). Contemporaneous filling of the IVC was highly suggestive of an associated arterio-venous fistula, although precise venous connections were difficult to define due to the extent of the pseudoaneurysm. Feeding branches arising from the internal iliac artery were embolised using a combination of coils, plugs and gelatin sponge. A post-operative duplex showed residual flow and repeat selective arteriography showed persistent arterial filling of the aneurysm from terminal branches of the right and left internal iliac arteries (Fig. 2). Further embolisation was performed to control arterial in-flow, but continued venous filling was identified on duplex and a decision was taken to proceed to surgical resection.

At laparotomy an isolated thin-walled pseudoaneurysm was evident deep in the pelvis and a sub-total hysterectomy and bilateral salpingo-oophorectomy was performed to obtain access. The right common and internal iliac arteries were noted to be widely enlarged, with calibres of 1.5 cm and 1 cm respectively. The pseudoaneurysm was isolated to a wide pedicle based on the lateral right pelvic wall and gluteal artery feeding vessels were ligated. On opening the sac, rapid venous bleeding was evident from several large venous connections based on the lateral pelvic wall. These were oversewn, achieving rapid haemostasis. The patient made an uneventful post-operative recovery and was discharged on day 5 post-operatively.

Discussion

The most likely aetiology of the pelvic pseudoaneurysm in this patient was post-traumatic, as a result of a previous caesarean section. Similar cases have been described, presenting up to 15 years following childbirth, and are thought to arise at the site of local haematomata.\(^1\)

CT angiography is an effective means of evaluating anatomical location and involvement of surrounding structures in pelvic pseudoaneurysms.\(^4\) Although we used selective angiography to successfully map arterial in-flow, we found precise arterio-venous connections were difficult to identify. Doppler ultrasound was used to monitor residual flow following embolisation attempts.

Patients with stable asymptomatic pelvic pseudoaneurysms or arteriovenous fistulae can probably be safely managed conservatively with serial vaginal ultrasound or MRI, as there is a low risk of spontaneous rupture.\(^5\) In this case, the pseudoaneurysm was progressively enlarging
with significant symptoms of pain, both indications for intervention.

Complex lesions with extensive arterio-venous connections are likely to require a combination of super-selective embolisation followed by extirpative surgery. Pre-operative embolisation was effective in limiting arterial in-flow to the pseudoaneurysm, allowing peri-operative focus on direct closure of abnormal gluteal and obturator feeding vessels and the large venous fistulae.

In view of the mildly aneurysmal right iliac arteries found at laparotomy, presumably due to vascular remodelling in association with a high flow fistula, we have arranged for the patient to be entered into a long-term duplex surveillance programme, in case of further aneurysmal iliac vessel degeneration.

In summary, pelvic pseudoaneuysms with arterial-venous fistulae present a complex management challenge. Active intervention should be limited to symptomatic patients who have been thoroughly investigated using multi-modal techniques, including CT, MRI and selective angiography. A multi-disciplinary approach is required, including experienced interventional radiologists, vascular surgeons and gynaecologists. Endovascular techniques may be used to facilitate surgical management.

References