

SHORT REPORT

Delayed Upstream Migration of an Iliac Stent

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Introduction. Stent migrations are described after peripheral endovascular treatments. We report a case of an unusual iliac stent movement after a successful angioplasty.

Report. An occlusive distal intimal flap after aorto-iliac endarterectomy was successfully fixed by stenting of the left external iliac artery. One month later, the patient was readmitted due to contralateral limb acute ischemia. Angiography revealed a right iliac artery thrombosis due to upstream stent migration from the left external iliac artery into the right common iliac artery. The patient underwent a combined surgical and endovascular rescue technique.

Conclusion. Turbulent and pulsatile flow, associated with wall remodelling may explain this unexpected complication.

Keywords: Stents and prostheses; Stent migration; Stenting complications.

Introduction

Stent angioplasty is an effective and well-accepted primary approach to aortoiliac occlusive disease.¹ In selected cases, it can be useful in correcting an unsatisfactory result of open surgery like an inadequate distal end-point after endarterectomy. Stents, however, may thrombose or migrate forced by the bloodstream or due to inappropriate dimensions.² We report a case of iliac artery stenting complicated by a very unusual upstream stent migration.

Case Report

A 60 year-old patient presented with intermittent claudication. After an unsuccessful endovascular attempt to cross a total occlusion of the left common iliac artery, the patient underwent an extensive endarterectomy with patch closure. Intraoperatively, after restoring aorto-iliac flow, loss of the left groin pulse was noted. Through percutaneous left femoral access, a retrograde angiography revealed an intimal flap at the distal end

of the endarterectomy. In addition, the external iliac artery appeared small, with an estimated diameter of the lumen of 5 mm (Fig. 1a). The intimal flap was successfully fixed (Fig. 1b) with a balloon expandable stent (Express 7 × 17 mm, Boston Scientific, Natick, USA) and flow was restored. Postoperative course was uneventful. The patient underwent double antiplatelet therapy and was discharged symptom free with bilateral femoral pulses present.

One month later, the patient was readmitted with a critically ischaemic right leg. On physical examination the right femoral pulse was absent. Duplex ultrasound and then aortography revealed complete thrombosis of the right common iliac artery, while the left ilio-femoral arteries were patent. The previously implanted stent had migrated upstream into the aorta and spontaneously deeply inserted into the ostium of the right common iliac artery thus occluding the vessel at its origin (Fig. 2a). Surgical thrombectomy of the right iliac artery was performed under fluoroscopy with a Fogarty catheter, a guidewire was passed lateral to the occluded stent that was then fixed to the wall with a kissing balloon stenting of the aortic bifurcation (Express 8 × 37 mm, Boston Scientific, Natick USA; Wavemax 10 × 38 mm, Abbott Vascular Devices, Illinois, USA) with angiographic (Fig. 2b) and clinical success.

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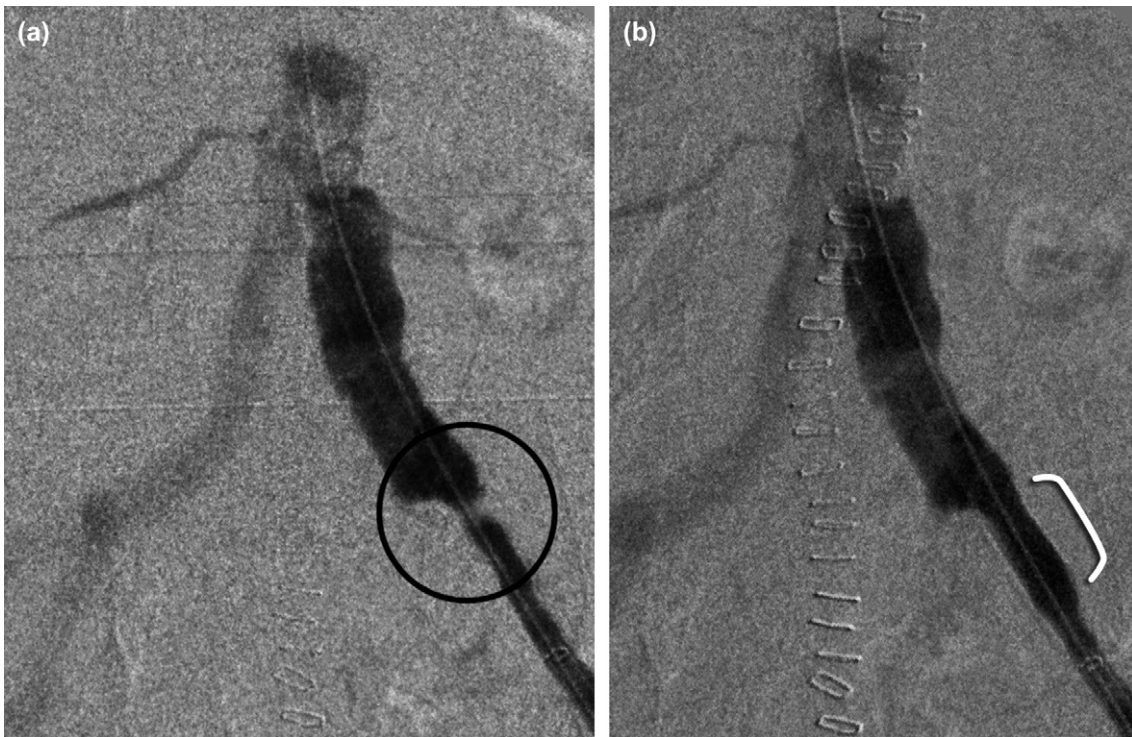


Fig. 1. (a) Intraoperative digital angiography through percutaneous left femoral approach. The retrograde injection of contrast medium shows the technical defect at the origin of external iliac artery. (b) Successful endovascular recanalization of the ilio-femoral axis. The left hypogastric artery is not visualized due to retrograde injection.



Fig. 2. (a) The stent moved upstream into the aorta, thus occluding the contralateral iliac artery. Note the good patency of the left iliac bifurcation. (b) Satisfactory angiographic result after kissing stenting of the aortic bifurcation.

Discussion

The highest jump a salmon has been known to make is a vertical one of 12 ft (3.7 m) at the Orrin Falls in Ross-shire. To our knowledge this is the first reported case of an upstream migration (up to 7 cm) of a bare stent against the aorto-iliac blood flow.

Slonim *et al.* reported³ a 2.5% rate of stent maldeployment in peripheral vessels that can cause complications for several reasons. The stent may compromise the lumen of the vessel for which it was intended, leading to thrombus formation and vessel occlusion, it may also cause embolization to a more peripheral vessel.

In the reported case we used a slightly oversized balloon-expandable stent to fix the intimal flap. We speculate that, when the spasm of artery resolved and the reperfused external iliac artery gradually enlarged to its normal diameter, the radial force of the 7 mm stent became insufficient thus allowing mobilization. Turbulences generated at the level of the aortic bifurcation, associated with pulsatile wall motions and arterial remodelling can explain the upward migration of the stent.⁴ These unexpected upstream forces, may

also be applied to aortic endografts where the presence of the fabric and the aneurysm increase the risk of iliac branch migration.⁵

References

- 1 NORRGREN L, HIATT WR, DORMANDY JA, NEHLER MR, HARRIS KA, FOWKES FG. On behalf of the TASC II working group. Inter-society consensus for the management of peripheral arterial disease (TASCII). *Eur J Vasc Endovasc Surg* 2007;**33**(1 Suppl):S1–S75 [Epub 2006 Nov 29].
- 2 PARHAM WA, PURI S, BITAR SR, KERN MJ. Management of iliac stent movement complicating peripheral vascular intervention: a rescue technique when stent deployment malfunctions. *J Invasive Cardiol* 2003 May;**15**(5):277–279.
- 3 SLONIM SM, DAKE MD, RAZAVI MK, KEE ST, SAMUELS SL, RHEE JS *et al.* Management of misplaced or migrated endovascular stents. *J Vasc Interv Radiol* 1999 Jul–Aug;**10**(7):851–859.
- 4 LI Z, KLEINSTREUER C. Analysis of biomechanical factors affecting stent-graft migration in an abdominal aortic aneurysm model. *J Biomech* 2006;**39**(12):2264–2273 [Epub 2005 Sep 8].
- 5 HEIKKINEN MA, ALSAC JM, ARKO FR, METSANOJA R, ZVAIGZNE A, ZARINS CK. The importance of iliac fixation in prevention of stent graft migration. *J Vasc Surg* 2006 Jun;**43**(6):1130–1137.

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