

Contents lists available at [ScienceDirect](http://www.sciencedirect.com)

International Journal of Surgery Case Reports

journal homepage: www.casereports.com

Bilateral prevascular herniae – A rare complication of aorto-uniiliac endovascular abdominal aortic aneurysm repair and femoro-femoral bypass



Obinna Obinwa*, Caitriona Canning, Martin O'Donohoe

Department of Vascular Surgery, Mater Misericordiae University Hospital, Eccles Street, Dublin, Ireland

ARTICLE INFO

Article history:

Received 25 January 2015

Received in revised form 30 March 2015

Accepted 31 March 2015

Available online 11 April 2015

Keywords:

Emergency EVAR

Femoro-femoral bypass

Prevascular hernia

Preperitoneal repair

ABSTRACT

A case of a 78-year-old female with bilateral groin prevascular herniae following an emergency aorto-uniiliac EVAR and femoro-femoral bypass for a ruptured abdominal aortic aneurysm is presented. Primary repair of the herniae was achieved using a preperitoneal approach. The case emphasises a safe approach to dealing with this rare complication.

© 2015 The Authors. Published by Elsevier Ltd. on behalf of Surgical Associates Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

Indications for femoro-femoral bypass include unilateral iliac artery occlusion and following aorto-uniiliac endovascular abdominal aortic aneurysm repair (EVAR) [1]. The graft is usually tunnelled subcutaneously, although, some authors advocate tunnelling via the retropubic (prevesical) space or cave of Retzius [2–4]. Prevascular hernia is a rare complication postoperatively [5]. We present a case in which bilateral prevascular herniae that developed after an emergency aorto-uniiliac EVAR and femoro-femoral bypass procedure were successfully repaired using the preperitoneal approach.

2. Presentation of case

A 78-year old lady with chronic obstructive pulmonary disease and an elevated body mass index (BMI 32) presented with acute back pain. She had a family history of abdominal aortic aneurysm (AAA) and subsequent CT scan demonstrated a contained rupture of a 6 cm AAA.

The aneurysm was repaired using a Cook Zenith aorto-uniiliac endovascular stent graft, a right iliac occluder and a left to right femoro-femoral bypass using a 6 mm ringed PTFE graft under the same general anaesthetic. The graft was tunnelled subcutaneously and anastomosed end to side to both common femoral arteries.

Her postoperative course was uneventful, and the patient was discharged on the 8th postoperative day.

Two years postoperatively, the aneurysm sac had shrunk to 4.0 cm but the patient developed sudden onset right lower limb claudication at 100 m. Imaging demonstrated that the femoro-femoral bypass was occluded. It was considered that the graft had kinked due to the patient's body habitus and so a new graft was inserted and this time tunnelled via the Cave of Retzius. The patient made an uneventful recovery and was discharged after six days.

Ten months after discharge, the patient developed a reducible swelling 5–7 cm in diameter behind her left groin incision. The swelling had a cough impulse and was diagnosed as a possible incisional hernia. Three months later, a similar swelling developed on the right side. As the left hernia was painful, it was decided that it should be repaired.

The preperitoneal space was accessed via a 6 cm transverse supra-inguinal incision. The hernia and contents were reduced *en masse*, exposing the transversalis fascia on the posterior wall of the inguinal canal, inguinal, lacunar and pectineal ligaments. The defect was lateral to the lacunar ligament but between the inguinal ligament and femoral/external iliac artery, and was therefore, a prevascular or Velveau's hernia. The femoro-femoral bypass was not visible in this operative field but could be felt deep to the medial end of the inguinal ligament. The defect was repaired using 15 × 15 cm polypropylene mesh, extending 7.5 cm along the iliac artery to the inguinal ligament and 7.5 cm up the transversalis fascia. The mesh was held in place using four polydioxanone absorbable sutures one in each quadrant and the peritoneum allowed back in place. The supra-inguinal wound was closed in two layers of

* Corresponding author. Tel.: +353 1 830 4251; fax: +353 1 802 4252.

E-mail addresses: obinnaobinwa@rcsi.ie (O. Obinwa), CCanning@rcsi.ie (C. Canning), modonohoe@mater.ie (M. O'Donohoe).

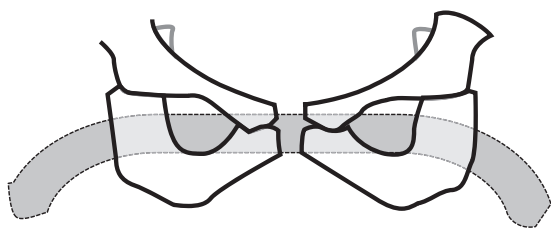


Fig. 1. Crossover graft tunnelled in the retropubic space.

polydioxanone, with poliglecaprone to the skin. Her postoperative course was uneventful, and the patient was discharged on day 3. The right side subsequently became painful and was repaired in a similar fashion two months later.

The aneurysm sac size continued to shrink, the graft remained patent and the herniae had not recurred at the time of her death six years later.

3. Discussion

Femoro-femoral crossover bypass was first described by Freeman and Leeds in 1952. The superficial femoral artery was used as a conduit, and was 'transposed beneath the tissues of the abdominal wall' [6]. The TASC II document reports a 75% 5-year patency for femoro-femoral bypasses, compared to an 80–90% 5-year patency for aortobifemoral bypasses [7].

The retropubic space (cave of Retzius) is that space between the pubic symphysis and the bladder. It contains loose connective tissue and fat [8]. This space is accessed via the retroinguinal space (Bogros' space), which is the extraperitoneal space deep to the inguinal ligament [9]. This is another avascular space.

In 1972, Tyson and Reichle described retropubic tunnelling of femoro-femoral crossover bypasses, to reduce the risk of occlusion [4]. In 1983, Mosley and Marston reported outcomes of 66 femoro-femoral bypasses that were tunnelled retropubically. They chose this route to protect the graft from trauma, and reported no cases of graft infection or anastomotic pseudoaneurysm on follow-up [3]. More recently, Read et al. [2] reported a series of 67 femoro-femoral bypasses, ten of which were tunnelled retropubically.

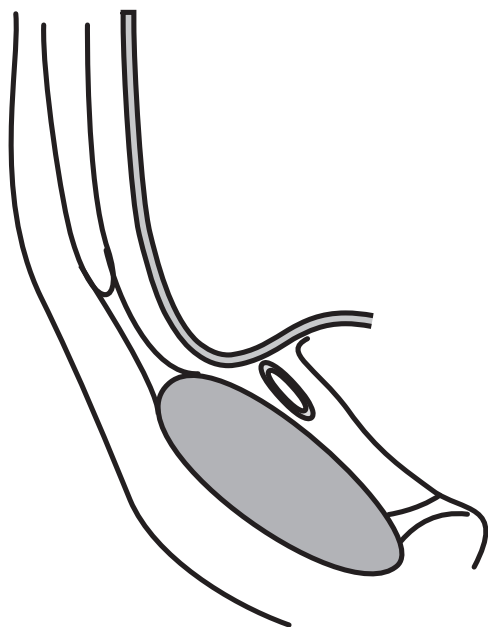


Fig. 2. Extra anatomical location of the bypass graft.

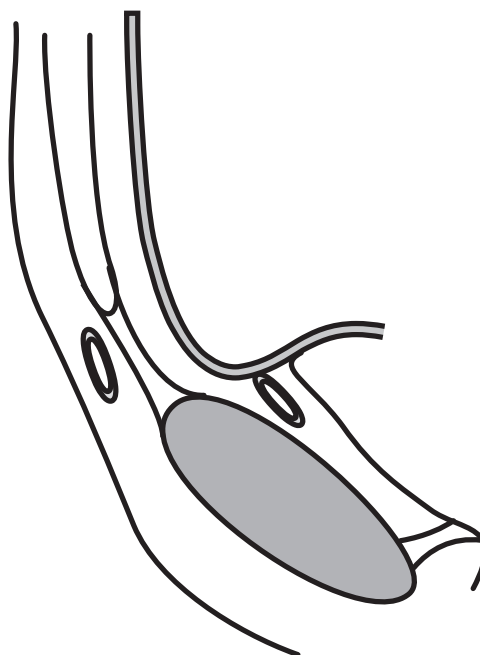


Fig. 3. Subcutaneous versus retropubic tunnelling of the bypass graft.

The incidence of graft thrombosis and infection was less in those patients with retropubically-tunnelled grafts [2]. Despite the safety and advantages of retropubic tunnelling (Figs. 1 and 2), subcutaneous tunnelling is more commonly practised (Fig. 3) [2,10–12].

In this case, bilateral prevascular hernia probably occurred due to weakening of the inguinal ligament with repeat dissection coupled with chronic cough. A preperitoneal approach was employed in this case. The technique is somewhat similar to that used for iliac endarterectomy [13]. Bilateral repair by tunnelling the mesh through the Cave of Retzius would have been dangerous in the presence of a femoro-femoral graft and would have exposed the patient to possible bladder injury or risk of graft infection. The direct classical repair was not considered as the presence of the graft would interfere with operative manoeuvres. The main advantage of our technique is avoidance of the graft and subsequent risk of infection. One similar case has been described in the literature. A 57-year-old gentleman who developed bilateral inguinal herniae after a femoro-femoral bypass had his herniae repaired by a laparoscopic approach [5].

4. Conclusion

Bilateral prevascular herniae are rare complications of aorto-uniliac EVAR and femoro-femoral bypass procedures. Treatment is advocated both for patients with symptoms and for asymptomatic patients who are at risk of developing future complications. In this report, an open approach using a preperitoneal technique proved safe and successful.

Conflict of interest

None.

Funding

No funding was secured for this study.

Ethical approval

An ethical approval was not required.

Submission declaration

The authors declare that the work described has not been published previously, that it is not under consideration for publication elsewhere, that its publication is approved by all authors and tacitly or explicitly by the responsible authorities where the work was carried out, and that if accepted, it will not be published elsewhere including electronically in the same form, in English or in any other language, without the written consent of the copyright-holder.

Authors contribution

Martin O'Donohoe conceived the initial idea of the study.

Obinna Obinwa, Caitriona Canning and Martin O'Donohoe acquired the data for publication, drafted the article and revised it critically for important intellectual content.

All authors approved the final version of the manuscript to be submitted.

Consent

Patient is deceased. A written informed consent could not therefore, be obtained. Data presented has been anonymised.

Guarantor

Mr. Martin O'Donohoe.

References

- [1] R.J. Hinchliffe, P. Alric, P.W. Wenham, B.R. Hopkinson, Durability of femorofemoral bypass grafting after aortouniiliac endovascular aneurysm repair, *J. Vasc. Surg.* 38 (3) (2003) 498–503.
- [2] R.C. Read, R.W. Barnes, J.F. Eidt, M. Hauer-Jenson, M.M. Moursi, Femorofemoral arterial bypass: subcutaneous or preperitoneal, *Vasc. Surg.* 34 (4) (2000) 337–344.
- [3] J.G. Mosley, A. Marston, Long term results of 66 femoral-to-femoral by-pass grafts: a 9-year follow-up, *Br. J. Surg.* 70 (10) (1983) 631–634.
- [4] R.R. Tyson, F.A. Reichle, Retropubic femorofemoral bypass: a new route through the space of Retzius, *Surgery* 72 (3) (1972) 401–403.
- [5] Y.J. Kawamura, N. Futakawa, H. Oshiro, H. Yasuhara, H. Shigematsu, T. Muto, Bilateral inguinal hernia repaired by laparoscopic technique: a rare complication of femorofemoral bypass, *Surg. Endosc.* 13 (11) (1999) 1157–1159.
- [6] N.E. Freeman, Leeds FH: operations on large arteries; application of recent advances, *Calif. Med.* 77 (4) (1952) 229–233.
- [7] L. Norgren, W.R. Hiatt, J.A. Dormandy, M.R. Nehler, K.A. Harris, F.G. Fowkes, Inter-society consensus for the management of peripheral arterial disease (TASC II), *J. Vasc. Surg.* 45 (Suppl. S) (2007) S5–67.
- [8] A.A. Retzius, Some remarks on the proper design of the semilunar lines of Douglas, *Edinburgh Med. J.* 3 (1858) 685–687.
- [9] R. Bendavid, The space of Bogros and the deep inguinal venous circulation, *Surg. Gynecol. Obstet.* 174 (5) (1992) 355–358.
- [10] P.J. Whatling, M. Gibson, E.P. Torrie, T.R. Magee, R.B. Galland, Iliac occlusions: stenting or crossover grafting? An examination of patency and cost, *Eur. J. Vasc. Endovasc. Surg.* 20 (1) (2000) 36–40.
- [11] R. Pursell, E. Sideso, T.R. Magee, R.B. Galland, Critical appraisal of femorofemoral crossover grafts, *Br. J. Surg.* 92 (5) (2005) 565–569.
- [12] Y.W. Kim, J.H. Lee, H.G. Kim, S. Huh, Factors affecting the long-term patency of crossover femorofemoral bypass graft, *Eur. J. Vasc. Endovasc. Surg.* 30 (4) (2005) 376–380.
- [13] C.L. Donohoe, J.F. Dowdall, C.O. McDonnell, M.K. O'Malley, M.K. O'Donohoe, Eversion endarterectomy for external iliac artery occlusive disease, *Vasc. Endovasc. Surg.* 45 (1) (2011) 46–50.

Open Access

This article is published Open Access at sciedirect.com. It is distributed under the [IJSCR Supplemental terms and conditions](#), which permits unrestricted non commercial use, distribution, and reproduction in any medium, provided the original authors and source are credited.