Embolization of Postsurgical Obturator Artery Pseudoaneurysm

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ABSTRACT

The anatomy of the obturator artery in the pelvis makes this vessel and its branches prone to iatrogenic injury during pelvic surgery. We present a postoperative obturator artery pseudoaneurysm treated by transcatheter embolization. Normal and variant obturator vascular anatomy, as well as pathology related to traumatic injury of this vessel, are subsequently discussed.

KEYWORDS: Obturator artery, pseudoaneurysm, embolization, corona mortis

Objectives: Upon completion of this article, the reader should be familiar with normal and variant anatomy of the obturator artery, recognize trauma that may occur to this vessel, and understand the role of endovascular therapy in the treatment of obturator artery injury.

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The anatomy of the obturator artery in the pelvis makes this vessel and its branches prone to iatrogenic injury during operations such as inguinal hernioplasty and prostatectomy.¹ Aberrant anatomy of the obturator artery may further increase such risk. In this article, we describe a postsurgical obturator artery pseudoaneurysm treated by transcatheter embolization and subsequently discuss normal and variant obturator vascular anatomy, as well as pathology related to traumatic injury of this vessel.

CASE REPORT

A 62-year-old man presented to the urology service with intermittent, marked hematuria 8 months after open prostatectomy. Hysteroscopy demonstrated a postsurgical defect of the prostatic urethra, but the source of hematuria was not demonstrated. Contrast-enhanced computed tomography (CT) showed heterogeneous

suprapubic and pelvic soft tissue presumed to be organizing hematoma within the surgical bed (Fig. 1). No active extravasation of contrast material was present.

The patient was referred to interventional radiology for diagnostic angiography and possible pelvic arterial embolization. A selective left internal iliac arteriogram from a right common femoral artery approach showed a large retropubic pseudoaneurysm supplied by a single small branch of the obturator artery (Fig. 2). Using a Tracker 325 microcatheter (Boston Scientific, Natick, MA) and a Transcend Wire (Boston Scientific, Natick, MA), this obturator branch was superselected and embolized using two 2 × 10 mm microcoils (Fig. 3). Follow-up angiography showed complete stasis of contrast material within the pseudoaneurysm. Superselective angiography of the left inferior epigastric artery revealed no evidence of arterial injury. The patient was discharged from the hospital 2 days after embolization. Follow-up in

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Figure 1 Contrast-enhanced coronal reformatted computed tomography shows heterogeneous suprapubic and pelvic soft tissue (arrowheads), presumed to be hematoma.

the urology clinic for 7 months showed no recurrent episodes of bleeding.

DISCUSSION

The obturator artery is typically supplied by the anterior trunk of the internal iliac artery, and it exits the pelvis through the obturator foramen at the lateral aspect of Cooper's ligament to supply the tissue surrounding the superior obturator foramen and portions of the acetabulum. The surrounding retropubic fat may obscure visualization of these small vessels during ilioinguinal incision, making them prone to iatrogenic injury during operations such as inguinal hernioplasty and prostatectomy.¹ The obturator veins are also prone to injury. In addition to iatrogenic injury, the proximity of these vessels to the superior pubic ramus may result in persistent hemorrhage associated with pelvic fractures.

For cases of traumatic or iatrogenic obturator artery injury, the resultant transection, pseudoaneurysm, or extravasation may result in massive uncontrolled hemorrhage. Early clinical recognition of potential obturator artery injury is critical to reducing morbidity and mortality. Contrast-enhanced CT may demonstrate hematoma or contrast extravasation involving the pelvic sidewall or obturator internus muscle.² Interventional radiology is the first line in both diagnosis and treatment via superselective transarterial embolization,³ originally described in the 1980s.⁴

Aberrant anatomy of the obturator artery can increase the risk of iatrogenic or traumatic injury. The obturator artery may have an anomalous origin from

Figure 2 Diagnostic angiography. (A) Selective left internal iliac arteriogram in left anterior oblique projection. (B) Delayed image shows filling of large saccular pseudoaneurysm supplied by small branch of obturator artery (arrow).

Figure 3 Superselection and embolization. (A) Angiogram showing superselection of obturator branch supplying pseudoaneurysm. (B) Successful embolization with two 2 × 10 mm microcoils as indicated by complete stasis of contrast within pseudoaneurysm.

Figure 4 Internal iliac arteriogram with reflux of contrast material into external iliac artery shows close proximity of branches of inferior epigastric artery (arrowhead) and obturator artery (arrow) on opposite sides of superior pubic ramus. An occasional connection between these arterial families (not present in this case) forms a vascular “crown” between internal and external arterial systems, and it may be injured during pelvic surgery or trauma leading to massive hemorrhage. For this reason, this communicating vessel is known as the corona mortis.

the inferior epigastric artery, the posterior trunk of the internal iliac artery, or the superior or inferior gluteal arteries. Branches of the obturator and inferior epigastric vessels lie in close proximity, on opposite sides of the superior pubic ramus (Fig. 4). An occasional anastomosis crossing the top of the superior pubic ramus to connect these two vascular distributions was termed “corona mortis” by Letournel⁵ because it forms a vascular “crown” prone to life-threatening hemorrhage when injured. Recent cadaveric studies have demonstrated that this type of anastomosis occurs with a relatively high frequency, ~19 to 43% for arterial communications and ~52 to 59% for venous communications.^{6,7} When injury to the corona mortis is suspected, embolization of the involved obturator and inferior epigastric branches may be necessary to achieve hemostasis. In all cases of obturator artery injury, angiographic imaging of both arterial distributions is recommended due to the high frequency of the corona mortis.

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