

Compressive chronic giant pseudoaneurysm of the left external iliac artery due to gunshot wound

Pseudoaneurisma gigante crónico compresivo de arteria ilíaca externa izquierda secundario a herida de arma de fuego

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ABSTRACT

Post-traumatic iliac pseudoaneurysms are rare. This is the case of a 44-year-old male patient with a past medical history of a gunshot wound who required a colostomy with bowel transit reconstruction. The patient sought medical attention 13 years later due to the presence of a painful pulsatile mass in his abdomen associated with rest pain of the patient's lower left extremity (Fontaine III - Rutherford IV) of 2-year duration. The CCTA revealed the presence of a pseudoaneurysm of the left external iliac artery of saccular morphology and a maximum diameter of 213 mm. The endovascular approach using 3 graft stents was successful. The CCTA had good results. This is the diagnostic, therapeutic and 1-year-follow-up approach.

Keywords: pseudoaneurysm, post-traumatic pseudoaneurysm, false aneurysm, gunshot wound, iliac angioplasty.

RESUMEN

Los pseudoaneurismas ilíacos postraumáticos son poco frecuentes. Presentamos un paciente masculino de 44 años con antecedentes herida de arma de fuego y requerimiento de colostomía con reconstrucción del tránsito. Consulta 13 años después por masa pulsátil dolorosa en abdomen asociada a dolor en reposo del miembro inferior izquierdo (Fontaine III – Rutherford IV) de dos años de evolución. La angio-TC evidenció pseudoaneurisma de arteria ilíaca externa izquierda de morfología sacular y diámetro máximo de 213 mm. El abordaje endovascular con tres stents graft fue exitoso. La angio-TC demostró buen resultado. Presentamos el enfoque diagnóstico, terapéutico y seguimiento al año.

Palabras clave: pseudoaneurisma, pseudoaneurisma postraumático, falso aneurisma, herida de arma de fuego, angioplastia ilíaca.

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INTRODUCTION

Post-traumatic iliac pseudoaneurysms are rare as very few cases of gunshot wound (GSW) related post-traumatic iliac pseudoaneurysms have been reported in the medical literature.

Pseudoaneurysms are due the interruption of the continuity of the arterial wall as the result of inflammation, trauma or iatrogenic causes. Under the influence of sustained blood pressure, blood dissects the tissues surrounding the artery yielding a perfused sac that communicates with the arterial lumen. The sac perfused is contained by the tunica media or tunica adventitia or simply by soft tissue structures surrounding the injured vessel.

This is the case of a 44-year-old male with a past medical history of GSW related colostomy and bowel transit reconstruction. The patient's clinical course progressed to a pseudoaneurysm located in the left external iliac artery (LEIA) that compressed the adjacent structures. The patient seeks medical attention 13 years after the fact. The patient was treated with endovascular therapy. This is the diagnostic, therapeutic, and follow-up approach at the 1-year follow-up.

OBJECTIVE

To show the case of a giant, chronic, post-traumatic pseudoaneurysm with LEIA occlusion treated with covered stents (CS) using the retrograde approach from an unconventional access site and present the outpatient follow-up.

CLINICAL CASE

This is the case of a 44-year-old male patient with a past medical history of GSW that required colostomy and bowel transit reconstruction. The patient seeks medical attention 13 years later due to painful pulsatile mass upon abdominal palpation and rest pain in his left lower extremity (Fontaine III - Rutherford IV) of 2-year duration. The CCTA (**Figure 1**) confirmed the presence of a saccular pseudoaneurysm located in the LEIA (171 mm x 165 mm x 213 mm) with displacement of adjacent structures at both pelvic and abdominal level, and external iliac artery lumen thinning and occlusion due to extrinsic compression and revealed the pseudoaneurysm entry site.

Using the Seldinger technique a 5-Fr sheath was inserted into the right common femoral artery. An S1 catheter was advanced and placed at left common iliac artery level. The control angiography confirmed the LEIA occlusion and thinning. Retrograde access was decided with angiographic guidance through antegrade access. A 7-Fr sheath was inserted into the left deep femoral artery and 60 IU/kg of heparin were administered. A 0.035 in hydrophilic guidewire (Radifocus Terumo, Tokyo, Japan) was advanced over a Cobra-type catheter towards the abdominal aorta. Once the lesion was crossed it was uneventfully dilated using a 5 mm x 120 mm balloon catheter (Mustang, Boston, Massachusetts, United States) at LEIA level. Afterwards, three 8 mm x 59 mm balloon-expandable CSs (Advanta V12, Maquet, Rastatt, Germany) were implanted in a telescopic fashion.

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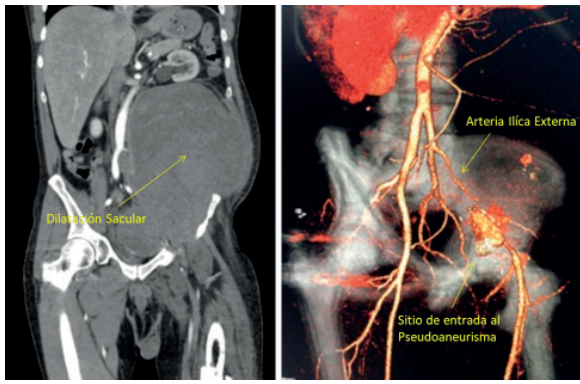


Figure 1. CCTA. A. Sacular dilatation (171 mm x 165 mm x 213 mm) in pelvis displacing adjacent structures at abdominal-pelvic level. B. Vascular reconstruction: iliac artery lumen thinning due to the compression exerted by the pseudoaneurysm and contrast-enhanced large area consistent with the pseudoaneurysm entry site.



Figure 3. CCTA at the 6-month follow-up. It shows the patency of the left iliofemoral axis and the exclusion of the pseudoaneurysm.

Finally, the angiography confirmed the patency of the LEIA with sealing and complete exclusion of the pseudoaneurysm (Figure 2). The patient had no complications and was released from the hospital 24 hours later with an indication for dual antiplatelet therapy. Disease progression at the 6-month and 1-year follow-up was asymptomatic and with lack of pulsatile mass. In the CCTA performed at the 6-month follow-up the LEIA looked patent and a 6 cm reduction of the sac was confirmed (Figure 3).

DISCUSSION

Pseudoaneurysms of the EIA are due to trauma, tumors, infections, vasculitis, atherosclerosis or iatrogenic complications.¹

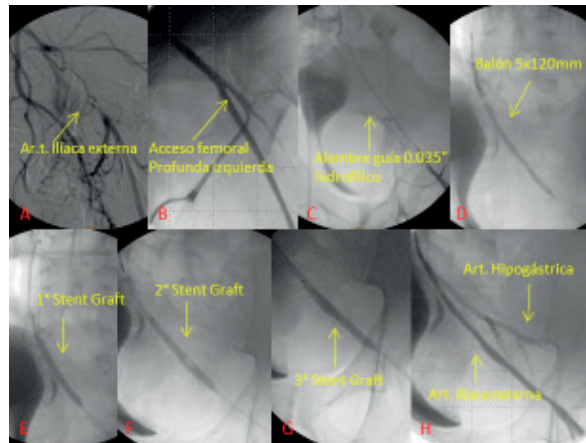


Figure 2. A. Right common femoral artery access with a 5-Fr sheath. Angiography performed using the Simmons 1 catheter. Collapsed small caliber left external iliac artery. B. Left deep femoral artery access (origin at the head of the femur). C. Hydrophilic guidewire advanced over a Cobra-type catheter towards the abdominal aorta. D. Predilatation with balloon catheter (5 mm x 120 mm). E, F, and G. Three 8 mm x 59 mm stent grafts implanted in a telescopic fashion. H. Final arteriography. Patent external iliac artery and exclusion of the pseudoaneurysm.

Most pseudoaneurysms are found when the trauma occurs, but there are cases of arterial lacerations that grow progressively and end up causing a pseudoaneurysm years later.² Pseudoaneurysms can have complications such as thromboembolism, rupture, neurovascular compression, infection, anemia, and death.

Thromboembolism and anemia are the most common complications of all. Ruptures can occur spontaneously or during an occlusion attempt by compression maneuver mainly in non-compressible pseudoaneurysms or those only compressible with increased strength. Similarly, serious and major complications like the ones described above can and should be avoided. The best way to do so is by making treatment decisions early in time.

The most common presentation at iliac level is an incidental finding without associated clinical signs. However, signs and symptoms associated with local compression can occur in up to 43% of the cases.³ Neuropathic pain affected 9.5% of the patients in Krupski's series,³ and up to 20% of the patients in Gardiner's series.⁴ Other associated signs are nonspecific abdominal pain (19%), urinary tract infection and hematuria (10%), vein compression related swelling (5%), and intermittent claudication (10%).³ Claudication and the pulsatile mass were the symptoms and signs described by our patient. These pseudoaneurysms often remain silent; however, if they rupture the consequences can be deadly.

The diagnosis of isolated iliac aneurysms and pseudoaneurysms can be confirmed using the following imaging modalities: ultrasound, computed tomography scan, magnetic resonance imaging, and arteriography. The ultrasound is less expensive compared to other imaging modalities, is operator-based, and often imprecise due to the depth of the arteries located in the pelvis or the presence of underlying intestinal gas.

In relation to treatment we can describe 6 different approaches: wait-and-see, surgical, blind or ultrasound-guided compression, ultrasound or angiography-guided saline infusion followed by endovascular compression using CSs or coils, and angiography or ultrasound-guided thrombin injection. Several studies published to this day claim that small

diameters < 2 cm often close through spontaneous thrombosis. Surgery is spared for cases of rupture, compression of adjacent neurovascular structures, skin ischemia, intense pain, and fast growth. Compression therapy is contraindicated in non-compressible or compressible pseudoaneurysms with arterial occlusions or increased distal flow reduction, superior location of the inguinal ligament, presence of infection, venous thrombosis, limb or skin ischemia, neurovascular compression or compartmental syndrome.⁵

The morbimortality rate of endovascular therapy is lower compared to conventional surgery with good mid-term results, which makes it a valid alternative for patients of high-surgical risk or previous abdominal surgery.⁶ CSs for the exclusion of pseudoaneurysm are currently used as an alternative to open surgical repair.⁷

If pseudoaneurysm has a wide neck the use of a CS or surgery are the preferred options given the high risk of coil embolization or embolization of the material used. However, CSs should not be used in terminal or small caliber vessels due to their high rate of thrombosis and restenosis.⁸

In our case we based our decision to choose endovascular therapy on the previous history of abdominal-pelvic surgery

in the gunshot wound setting, which would have made a second access associated with the need for revascularization of the LEIA more difficult due to its compression by the large volume of the pseudoaneurysm. The use of thrombin and coils would not be recommended here given the pseudoaneurysm large volume and wide neck. Compression would not be useful either because it would be placed above the inguinal canal.

CSs or endoprotheses have been successful used in the exclusion of pseudoaneurysms since the 1990s.

CONCLUSION

Trauma related complications are mostly the result of diagnostic, treatment or follow-up delays or errors and they can be occur in the short, mid, and long-term. Endovascular therapy stands as an alternative for high-surgical risk patients or those treated with previous abdominal surgery. The main goal of surgery for the management of vascular lesions is to control the hemorrhage.

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