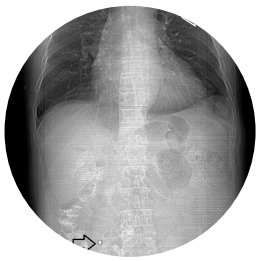

The unexpected diagnosis of a traumatic arteriovenous fistula in the iliac vessels. Case presentation

El inesperado diagnóstico de una fístula arteriovenosa traumática en vasos ilíacos. Presentación de caso

Johan Sebastián Ramos Marín[1]
Maira Alejandra Jiménez Claros[2]
María Camila Pérez Vanegas[2]
Luis Antonio Galvis Vásquez[2]

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Summary

Traumatic arteriovenous fistulas are rare conditions presenting low prevalence among the general population which are difficult to diagnose in the early stage of disease. Late diagnosis and location of the lesion in a large caliber vessel are associated in most cases with hemodynamic complications such as heart failure. Radiological methods such as CT angiography are efficacious tools with high sensitivity and specificity for detecting vascular alterations. The objective of this case report is to describe an incidental finding of a traumatic arteriovenous fistula of 44 years of evolution.

Resumen

Las fístulas arteriovenosas traumáticas son entidades muy poco frecuentes que se presentan con una baja prevalencia entre la población general y son de muy difícil identificación en su etapa inicial. El diagnóstico tardío y la localización de la lesión en vasos de gran calibre están asociados en la mayoría de casos a complicaciones hemodinámicas como la insuficiencia cardiaca. Los métodos radiológicos, como la angiografía por TC, son herramientas eficaces con una alta sensibilidad y especificidad para la detección de alteraciones vasculares. El objetivo de esta publicación es presentar el inesperado caso de una fístula arteriovenosa traumática de vasos ilíacos de 44 años de evolución.

Introduction

Traumatic arteriovenous fistulas (AVF) are defined as abnormal communication between an artery and an adjacent vein due to damage of these vessels (1). Depending on the location and diameter of the vessels involved, important systemic alterations may occur (2). In most cases there is no clear and specific symptomatology at the beginning that allows early identification of this entity, so a large percentage of patients with this pathology are diagnosed late, which leads to some hemodynamic complications associated with the chronification of fistulas, such as heart failure (HF) at the time of diagnosis (1-4). Early clinical suspicion and detection of tomographic signs is important in order to prevent the consequences related to late diagnosis (4, 5).

Case presentation

A 63-year-old male patient, hemodynamically stable, with a non-painful pulsatile abdominal mass in the right lower quadrant, with continuous murmur on auscultation and frémito on palpation, initially studied with abdominal ultrasound with finding of abdominal aortic aneurysm. Subsequently, an abdominal angiotomography was performed for a correct evaluation of the vascular anatomy. The topogram showed signs suggestive of HF and multiple foreign bodies in the pelvis, related to a history of multiple gunshot wounds 44 years ago, which did not require surgery at the time (Figure 1). During the arterial phase, early filling of the inferior vena cava throughout its course was noted (Figure 2). An abdominal aortic aneurysm with a diameter of 47.6 mm was found, extending to the right common iliac and internal iliac arteries. Additionally, ectasia of the inferior vena cava was observed before its bifurcation with a maximum diameter of 49.3 mm, extending to the right common and external iliac veins. These findings were accompanied by multiple anterior and posterior venous collaterals between the right and left systems (Figure 3). All vascular alterations, arterial and venous, and gunshot pellets were depicted on volume rendering

[1]Medical student at the University of Pamplona, technologist in Radiology and Diagnostic Imaging. Cúcuta, Colombia.

[2]Medical Student University of Pamplona. Cúcuta, Colombia. Institution to which the work is attributed: IMD Parque Medico, Manizales, Caldas.

(VR) reconstruction (Figure 4). The findings described were conclusive with a long-standing post-traumatic arteriovenous fistula between the internal iliac artery and the common iliac vein (Figure 5). Initially, due to the characteristics and location of the AVF, an endovascular approach was chosen, which failed, and for this reason the correction was made by open surgery.

Discussion

Traumatic AVFs are unusual conditions in which there is abnormal communication between the arterial and venous systems. They can occur in up to 7% of arterial injuries following trauma, and are most often associated with sharps injuries (63%) and gunshot wounds (26%), respectively (1-3). Few cases of traumatic AVF involving iliac vessels have been reported in the literature (1, 2, 4, 5). Regardless of the site, these can be classified as primary, which correspond to 80% of cases, and are due to rupture of an aortoiliac aneurysm into the venous system, or secondary, which represent the remaining 20% and are the result of trauma or iatrogenesis, category in which the case described above would be classified (4). Anatomically, AVF occurring distally to the brachial artery and the popliteal artery rarely produce complications, while those located proximally to these vessels tend to be major and high debit AVF (2). The classic signs of major AVF include a pulsatile mass, auscultation of a continuous murmur, and frémito in the affected area (1, 5, 6). The Nicoladonie-Branham sign has been described, which consists in the application of compression on the vessels proximal to the AVF that will produce the disappearance of the murmur and the frémito (3). Among the complications associated with this entity, the most relevant are hemodynamic alterations and potentially fatal HF (1-5,7). Generally, a period of up to 15.1 years is required for the appearance of symptoms suggestive of HF (2). However, a percentage of patients (28%) may present within the first year after the onset of HF (2). Rarely is the diagnosis made in a timely manner, since signs and symptoms are infrequently present in their initial stage, and adding the low frequency of these, they are rarely suspected clinically, delaying the diagnosis for months, years and even decades (1, 4, 7, 8). Regarding imaging tests, digital subtraction angiography (DSA) is the gold standard for the diagnosis of this type of conditions (1). Currently, there are other non-invasive, economic and affordable diagnostic methods, such as angiotomography and Doppler ultrasound that could reveal vascular dilatation, turbulent flow, low resistance arterial pattern with increased diastolic flow and arterialization or chaotic waves at the point of communication or in the affected vein (1,6). Angiotomography has a sensitivity between 90-100% and a specificity close to 100% in the detection of vascular alterations including major AVF, it is a superior diagnostic method to Doppler ultrasound and has the advantage of being operator-independent (1, 6). The set of tomographic findings such as the presence of multiple foreign bodies, early venous opacification, arterial and venous dilatations, varicosities and the presence of collateral circulation due to volume overload and increased pressure of the venous system, were the main signs that led to suspect the presence of an AVF of iliac vessels, similar radiological characteristics found in the different cases described in the literature (1, 4, 8). Regarding its treatment, the open surgical approach can be complicated due to scar tissue around the trauma, extensive network of collaterals, arterialization of the veins with complex venous anatomy as a consequence of the chronification of the lesion and risk of important bleeding; mortality rates through this approach are around 12%-25% (4). Endovascular repair of AVFs is a safer method with success rates of up to 94%; however, 12% will require endovascular reintervention (4).

Conclusion

The tomographic signs suggestive of AVF together with the clinical findings and the patient's traumatic history are the key to a correct and timely diagnosis that would prevent chronic and potentially fatal hemodynamic alterations such as HF derived from this unusual entity.

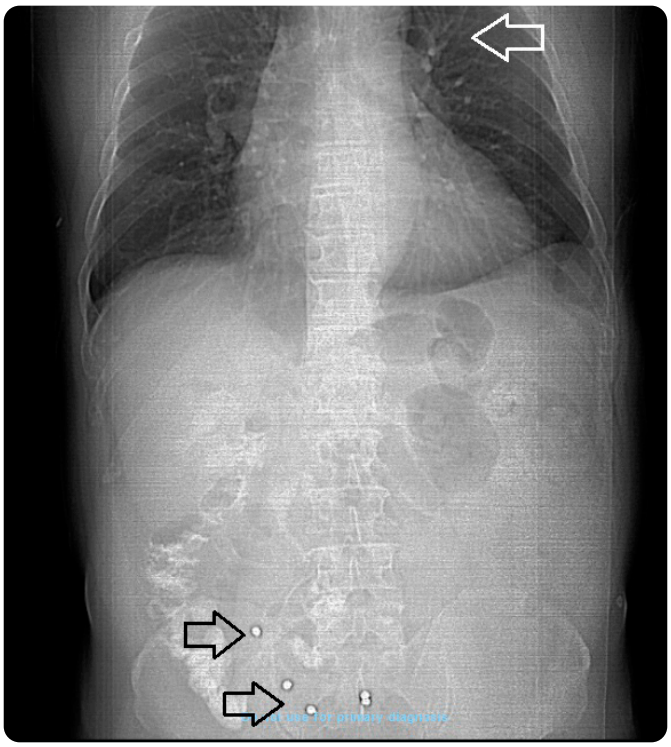

Figure 1. Topogram of thoracoabdominal angiography. Mild cardiomegaly, cephalic flow shunt (white arrow) and multiple foreign bodies of round morphology and metallic density in the pelvis (black arrows) are observed.

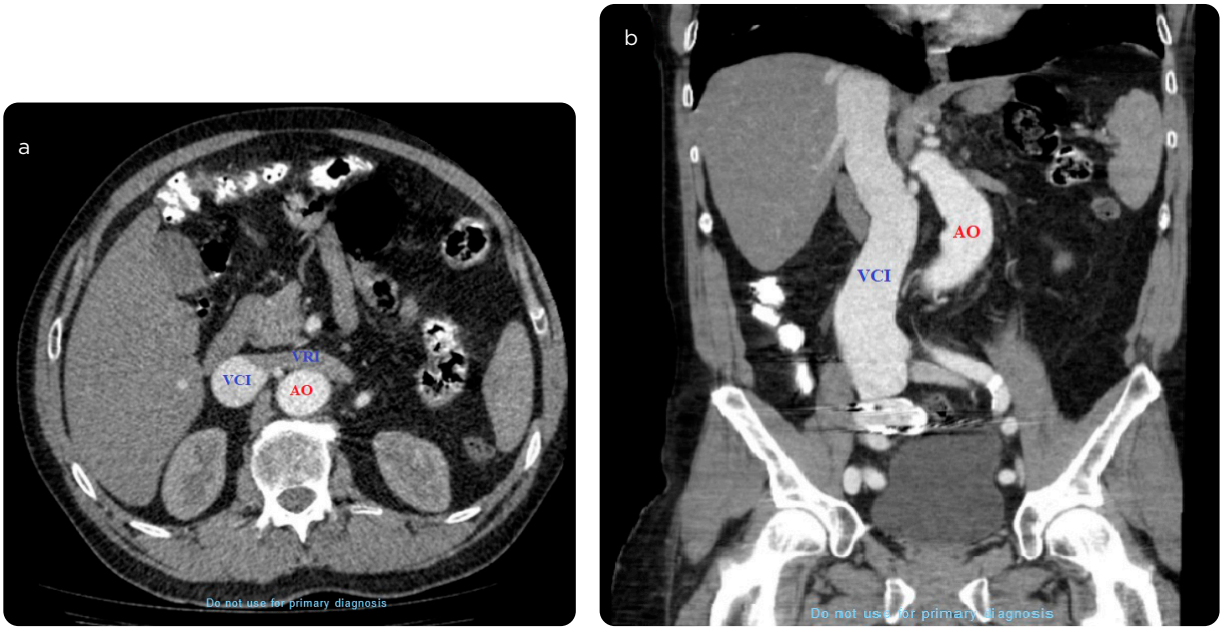

Figure 2. Angiotomography of the abdomen in axial section (a) and coronal section (b): Early relief of the inferior vena cava (IVC) and its homogeneous density compared to the abdominal aorta (AA). Non-opacified left renal vein (LRV) representing the acquisition of an early arterial phase.

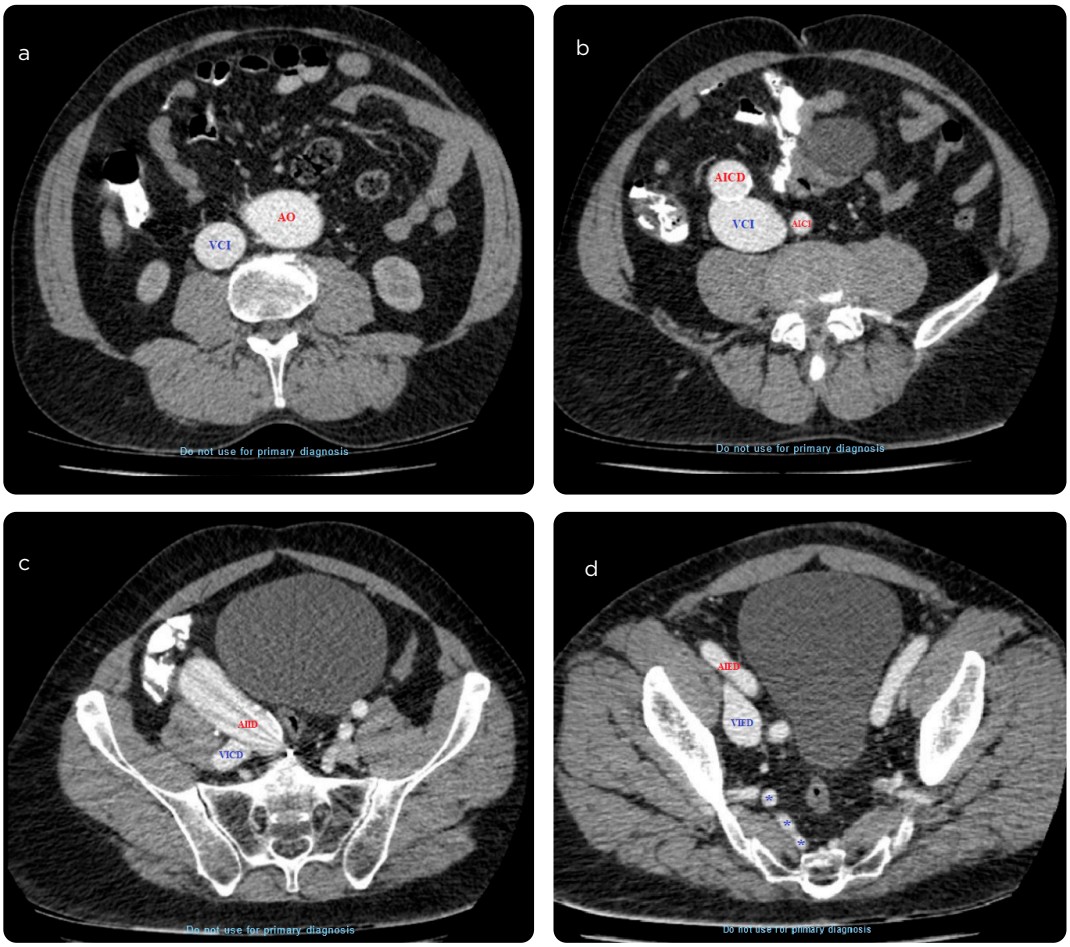

Figure 3. Angiotomography of the abdomen in arterial phase, axial sections. (a) Dilatation of the abdominal aorta (AA) and inferior vena cava (IVC); (b) dilatation of the right common iliac artery (RCIA) compared to the left common iliac artery (LCA); (c) dilatation of the right internal iliac artery (RITA) and right common iliac vein (RCIV); d) dilatation of the right external iliac vein (REIV) and normal caliber of the right superficial iliac artery (RSIA), additionally varicosities of the sacral venous plexuses are observed (asterisks).

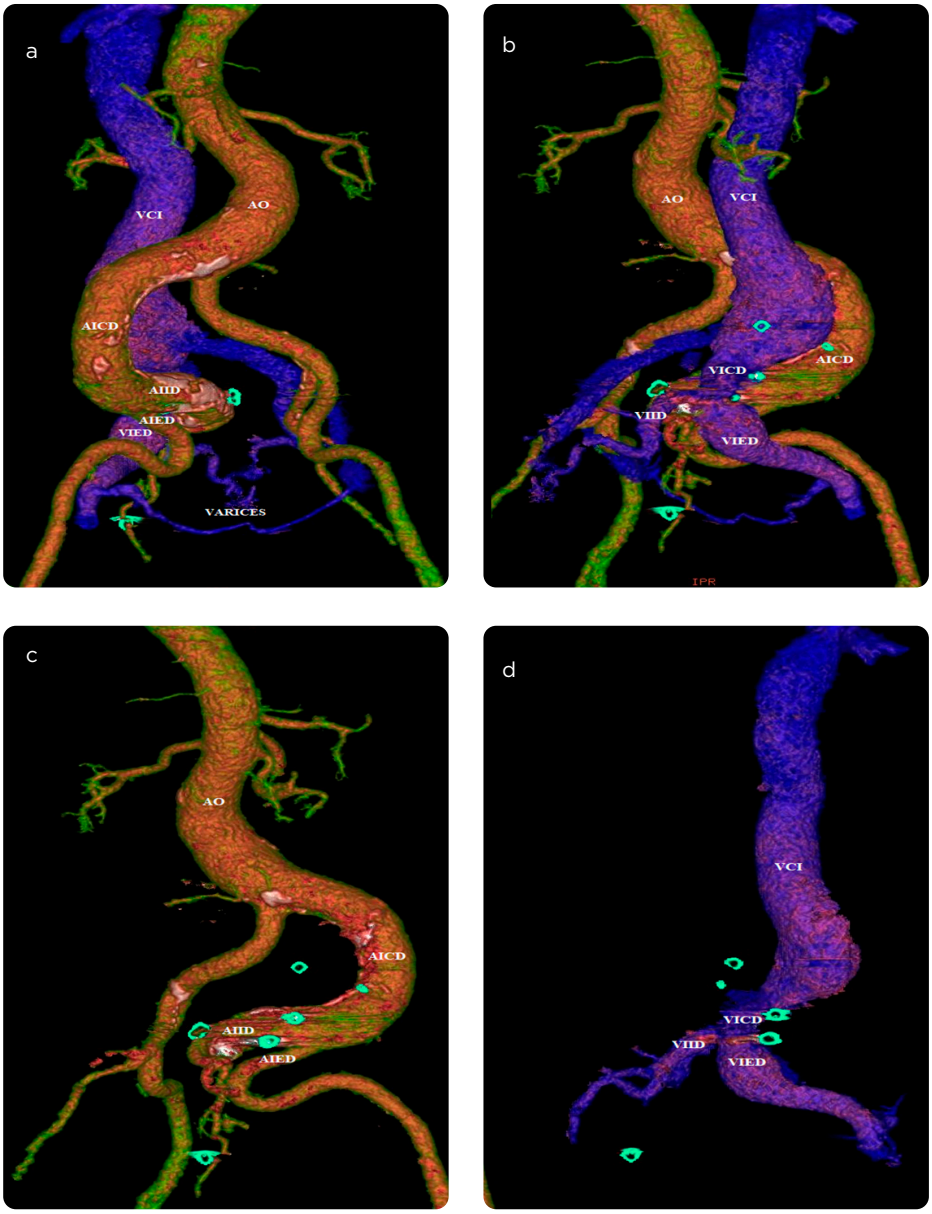

Figure 4. RV reconstruction showing the arterial and venous dilatations due to the fistula, in addition to the a) Frontal view; b) right posterior oblique view; c) right posterior oblique selective view of the arterial system; d) right lateral selective view of the venous system. Abdominal aorta (AA), right common iliac artery (RCIA), right internal iliac artery (RIIA), right external iliac artery (REIA), inferior vena cava (IVC), right common iliac vein (RCIV), right internal iliac vein (RIIV) and right external iliac vein (REIV).

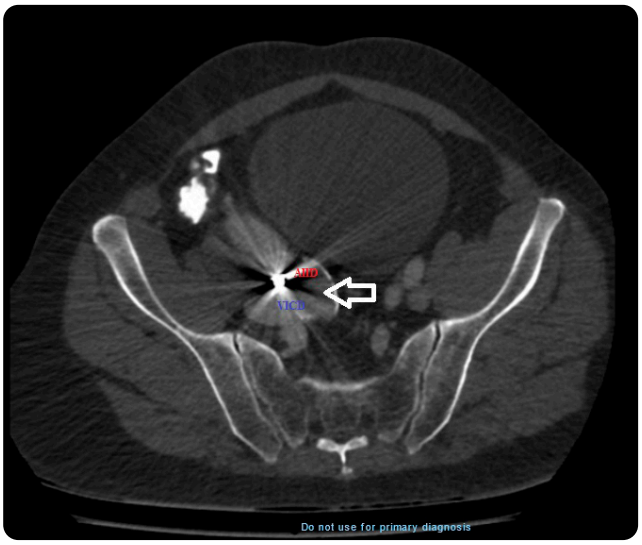

Figure 5. Angiotomography of the abdomen, axial section and increase in the window amplitude. Artifice due to hardening of the ray caused by the pellet is observed. The anomalous communication (arrow) between the right internal iliac artery (RITA) and the right common iliac vein (RCIV) is identified.

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Correspondence

Johan Sebastián Ramos Marín
Universidad de Pamplona
Calle 0 # 9E-35
Cúcuta, Colombia
sebastian8912031@gmail.com

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