

Case Report

Postdiskectomy AV fistula: CT angiographic demonstration

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Abstract. Postdiskectomy vascular complications are well known. Immediate postoperative vascular complications are diagnosed promptly and treated successfully in most cases. Postdiskectomy arteriovenous fistula occurs due to perforation of the anterior longitudinal ligament with injury to adjacent vessels like aorta, iliac vein, iliac artery or inferior vena cava, iliac vein being the most commonly involved vascular structure. In most patients, overt signs and symptoms of postdiskectomy fistula are not apparent until many years after injury usually presenting as high output failure. Although catheter angiography has been the gold standard for diagnosis, CT angiography with 64 slice CT gives 'spectacular' 3 dimensional and multiplanar demonstration of the fistula, making direct angiography unnecessary.

Key words: AV fistula, CT angiography, diskectomy

1. Introduction

Postdiskectomy vascular complications have an incidence of 17/10,000 of operations (1). Acute injuries present right on the operating table with intra/extraperitoneal hemorrhage and are repaired immediately. Late presentations like arteriovenous fistula may become apparent months to years after diskectomy as high output failure with symptoms and signs of dyspnea, leg edema, ascites etc. The injury occurs due to perforation of the anterior longitudinal ligament by the disc extracting forceps.

2. Case report

A 47-year-old man presented to the Cardiology clinic of our hospital with symptoms and signs of congestive cardiac failure and bilateral leg swelling.

The patient's symptoms had started about eight months back, three months after he had disc surgery at T11-T12 and T12-L1 by an orthopedician and a neurosurgeon at a private general hospital. The patient was treated for his symptoms by a general practitioner for many months with some relief but was finally referred for cardiology work up to our hospital. On examination the patient was breathless with bilateral leg swelling. Jugular venous pressure (JVP) was raised. Abdominal examination revealed a prominent bruit in the umbilical region. On auscultation the bruit was continuous with both systolic and diastolic components. Ultrasonography revealed congested hepatomegaly with dilated inferior vena cava (IVC). Spectral Doppler examination showed arterial waveform in IVC. There was no evidence of ascites or pleural effusion. Echocardiography revealed dilated right chambers with tricuspid regurgitation. Laboratory findings were unremarkable with normal renal and hepatic function parameters. Aortography showed quick washout of contrast into IVC with markedly dilated IVC and both common iliac veins, however the site of the fistula could not be ascertained on aortography. CT angiography was conducted using 64 slice CT (Siemens Sensation 64- Siemens, Forcheim, Germany) with 70 ml of nonionic contrast (Omnipaque 350 mg I/ml)

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intravenously by power injector followed by saline chase. Three-dimensional reconstruction and maximum intensity projection (MIP) reconstruction of data was conducted on an independent workstation (Leonardo 64-Siemens Medical Solutions, Erlangen, Germany). A fistulous communication was clearly demonstrated at aorto-caval level on axial source images (Fig.1A) and coronal multiplanar reconstruction (MPR) (Fig.1B).



Fig. 1A. Axial source image showing aorto-caval fistula.



Fig. 1B. Coronal MPR showing the fistula.

Three-dimensional reconstruction and MIP showed markedly dilated IVC, both common iliac veins and external and internal iliac veins on both sides with accurate depiction of the aorto-caval fistula (Fig. 2A, 2B). The fistula was located near the site of disc operation which showed postoperative fibrosis around it. The patient underwent surgery with Dacron graft placement in the infrarenal abdominal aorta. The patient

improved remarkably after surgery and is on follow up.

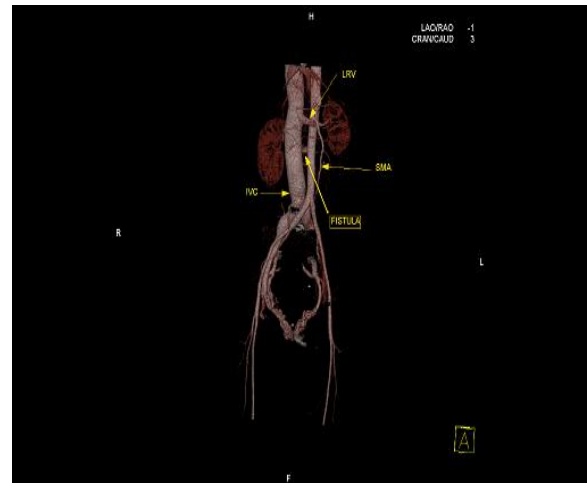


Fig. 2A. 3 Dimensional reformation depicting the fistula

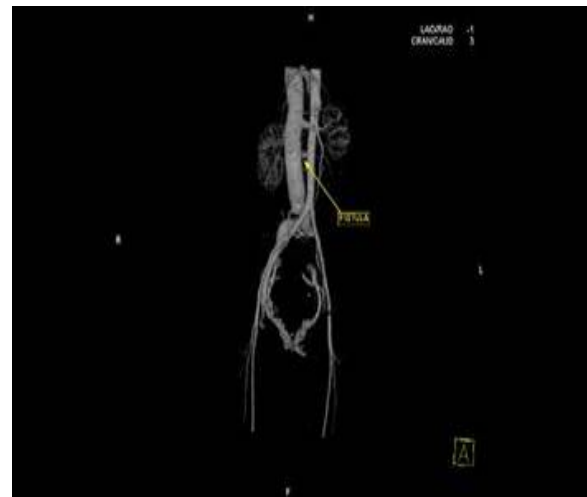


Fig. 2B. MIP reconstruction of the fistula

3. Discussion

The incidence of postdiskectomy vascular complications is nearly 17/10,000 operations (1). One study involving 8099 cases of lumbar disc surgery over a period of 14 years reported 4 cases (0.5%) of disc related vascular complications (2). Acute vascular injuries are diagnosed promptly due to shock or hemorrhage on the table and treated immediately (3). The injury occurs due to perforation of anterior longitudinal ligament. Whether the aorta or iliac vessels are involved depends upon the angle of the instrument and anatomic variation in aorto-caval bifurcation (4). The time interval between first clinical signs of aorto-caval fistula and diagnosis ranges from 6 hours to 2 years depending upon the severity (5). Some cases may present as late as 8 years (6).

The commonest site of fistula is right common iliac and IVC (7). The clinical presentation includes high output cardiac failure, leg edema, renal failure and abdominal bruit, the latter being a reliable clinical sign. The diagnosis may not be made in late cases due to vague history of symptoms.

When clinically suspected confirmation is usually by aortography. Treatment is with surgical repair of the fistula by direct suture with arterial reconstruction using woven Dacron graft or preferably a polytetrafluoroethylene (PTFE) graft. Percutaneous interventional techniques are now being used more frequently with excellent results (8-10). Multislice CT angiography offers non-invasive diagnosis of the fistula with impressive demonstration of the fistulous connection in multiplanar and 3D formats, offering the surgeon virtual preoperative perspective of the pathology on table, not possible with other investigative tools like aortography. In our case the fistulous location was higher than usually reported, and aortography failed to visualize the fistulous track due to rapid run off of contrast material into the IVC.

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