

Endovascular treatment of false-aneurysm ten years after dacron patch aortoplasty for coarctation of the aortic isthmus

Report of a case



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Endovascular treatment of false-aneurysm ten year after Dacron patch aortoplasty for coarctation of the aortic isthmus. Report of a case

False aneurysm degeneration is a known complication of patch aortoplasty for coarctation of the aortic isthmus. Open surgical treatment consists of prosthetic graft repair of the involved aorta, often requires circulatory arrest to achieve a safe proximal aortic control and perform proximal anastomosis, and finally is associated with substantial perioperative morbidity. Endografting of the diseased aorta is a valuable alternative to open repair, when feasible, with good short and long term results.

We now report one more case of false aneurysm ten years after Dacron patch aortoplasty for isthmic coarctation in a 26-year-old woman, successfully treated by endovascular repair via the left common iliac artery, and a complete exclusion of the aneurysm at two year follow-up.

KEY WORDS: Aortic coarctation, Endovascular treatment, False aneurysm

Introduction

Coarctation of the isthmic aorta accounts for 5-10% of all congenital cardiovascular diseases ¹. Surgical treatment of this condition includes resection/anastomosis, resection/prosthetic graft replacement, and patch aortoplasty of the diseased aortic segment. Non-septic, false aneurysm

degeneration is a known complication especially of the latter technique, whose incidence ranges between 11-24 % ². Open surgical repair of the false aneurysm requires an iterative access to a potentially heavily scarred surgical field, and, not infrequently, an hypothermic circulatory arrest to achieve proximal aortic control and to safely perform the proximal anastomosis of the graft ³. Open treatment may be associated with a significant perioperative morbidity.

Endovascular repair, when feasible, may allow an effective treatment of this condition, while significantly reducing the magnitude of the operation, with the consequent major perioperative morbidity, and the length of stay in the hospital.

The case of a 26-year-old woman developing a 56 mm diameter isthmic false aneurysm ten years after patch aortoplasty for coarctation, successfully treated by endovascular exclusion via the left common iliac artery is reported.

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Case report

A 26-year-old woman was admitted for interscapular thoracic pain of abrupt onset and palpitations. She underwent Dacron patch aortoplasty of an isthmic coarctation at another institution, ten years earlier. Chest X-ray showed an enlarged cardiac profile and an abnormal dilatation of the aortic arch (Figg. 1a-1b). Magnetic Resonance angiography (MRA) revealed an iterative aortic coarctation and a 56 mm diameter, false aneurysm in the distal aortic arch (Fig. 2). Computed Tomography (CT) confirmed a descending aortic aneurysm 56 mm in diameter, arising 1 cm distally to the origin of the left subclavian artery, and a hypoplasia of the descending aorta (Fig. 3). Given the favourable anatomy of the

aneurysm, and in order to avoid the potential morbidity of an iterative open treatment, endovascular repair was planned. As the common femoral artery diameter was 6 mm, the common left iliac artery was exposed

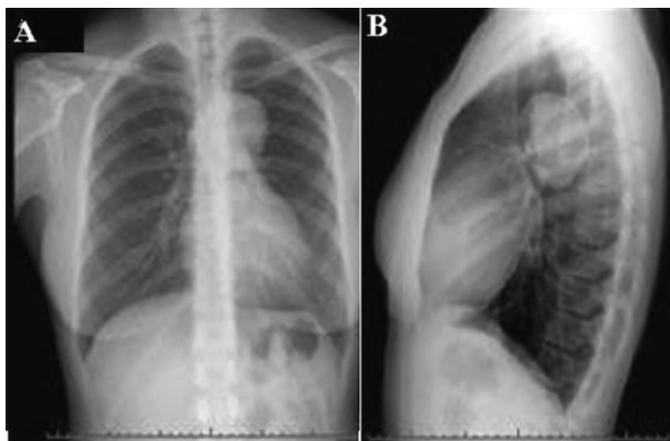


Fig. 1: Chest X-ray. Enlargement of the cardiac profile (A), and focal dilatation of the thoracic aorta (B).



Fig. 2: MRA imaging. Iterative coarctation of the aortic isthmus and aneurysmal dilatation of the proximal descending aorta.



Fig. 3: Multi slice CT-scan. Sacciform false aneurysm of the proximal descending aorta of 56 mm diameter associated with hypoplasia of the distal descending aorta.



Fig. 4: Pre-procedural angiography. The aneurysm originates just below the left subclavian artery.

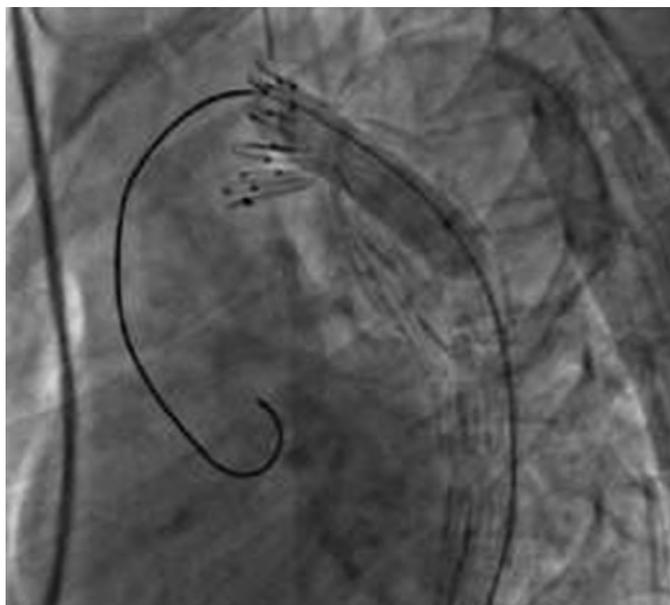


Fig. 5: Fluoroscopic control. Correct positioning and deployment of the endograft.

through a retroperitoneal access, under general anesthesia. After systemic heparinization (50 UI/Kg), a pigtail catheter was percutaneously advanced from the right common femoral artery and an arch angiogram was obtained (Fig. 4). A Dacron endograft, 30 mm proximal, and 20 mm distal diameter, 20 cm of length (Zenith-Cook, Bloomington, IN) was advanced through the left common iliac artery, and deployed with the free-flow stent over the ostium of the left common carotid artery, covering the origin of the left subclavian artery (Fig. 5). After stent graft deployment the blood pressure gradient was approximately 15mmHg (ascending aorta 95mmHg; descending aorta 80mmHg). The graft was subsequently balloon-dilated and a further lowering of the pressure gradient to 10mmHg was obtained. Control angiography showed the correct morphology of endograft placement with complete exclusion of the aneurysm, no endoleaks, and the normal patency of the innominate and left carotid artery. Postoperative course was uneventful and the patient was discharged home on postoperative day 4.

Since no left arm ischemia or claudication was apparent we elected not to perform an additional left subclavian artery revascularization.

Discussion

Surgical techniques for treatment of aortic coarctation include resection followed by end to end anastomosis or graft interposition, and patch aortoplasty. After surgical repair the development of late complications is not

uncommon, including aneurysm formation at the site of repair, with an incidence ranging from 11- 24%⁴. If not detected and treated, the reported mortality rate of false aneurysm formation ranges from 36% to 100%⁵. The open surgical treatment of false aneurysm formation can be very challenging, needing access to an already operated area, and frequently requiring hypothermic circulatory arrest, in order to gain safe proximal aortic control and to perform proximal graft anastomosis. Several authors observed that redo open surgery is associated with higher morbidity and mortality rates than endovascular approach: actually redo surgery is reported to be associated with a 14% combined in-hospital mortality and major neurological complications rate⁶. Endograft exclusion is a feasible alternative treatment for patients presenting with false aneurysm after surgical repair of aortic coarctation. Mortality and morbidity are significantly lower than redo open surgery. The only concerns of endograft treatment are related to its feasibility and long term duration⁷. In the reported case the anatomical feasibility definitely favoured endovascular over open surgical treatment. Long term duration may be hindered by the progressive enlargement of aorta as the patients, usually operated at an early age, grow up. However, in the present report, the already adult age of the patient should allow a favourable late outcome of the technique.

One more point of debate is the need for left subclavian artery revascularization. Covering of the left subclavian artery is associated with the potential risk for ischemic complications (upper extremity ischemia, stroke, spinal cord ischemia). The occurrence of these complications has not been uniform and in many cases the covering of the left subclavian artery is well tolerated without significant clinical sequelae. Formal indications for left subclavian artery revascularization associated with endograft covering of its ostium include anomalous subclavian or vertebral arteries, dominant left vertebral artery, potential need for left anterior descending coronary artery for future coronary artery bypass grafting, development of ischemic symptoms of left upper extremity⁸⁻¹⁰. In the present report a preoperative imaging study showed a normal origin of subclavian and vertebral arteries as well as complete circle of Willis. Moreover, since no left upper claudication or subclavian steal was apparent we elected not to perform a selective revascularization of the left subclavian artery.

In conclusion, the reported case supports endograft exclusion of false aneurysms of the aorta arising from previous patch aortoplasty for isthmus coarctation, when they develop in the adult age and anatomy is favourable.

Riassunto

La riparazione chirurgica mediante patch della coarctazione aortica all'istmo ha come complicanza più fre-

quente la formazione di uno pseudo aneurisma. Il trattamento chirurgico consiste nella sostituzione protesica del tratto di aorta interessato dal processo di degenerazione pseudo aneurismatica. Tale approccio richiede spesso un arresto di circolo necessario ad ottenere un sicuro controllo dell'arco aortico nonché ad effettuare l'anastomosi prossimale, è pertanto associato ad un'elevata morbilità perioperatoria. Il trattamento endovascolare risulta essere una valida alternativa al trattamento chirurgico, quando possibile, associata ad un buon risultato a breve e lungo termine.

Riportiamo il caso clinico di una donna di 26 anni affetta da pseudo aneurisma, a 10 anni dalla riparazione chirurgica mediante patch in Dacron di una coartazione aortica all'istmo, trattato con successo mediante esclusione endovascolare attraverso accesso chirurgico all'arteria iliaca comune sinistra e completamente escluso a 2 anni di follow-up.

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