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SOCIETÀ ITALIANA DI CARDIOLOGIA PEDIATRICA E DELLE CARDIOPATIE CONGENITE

PERCUTANEOUS DUPLICATION OF THE THORACIC AORTA IN A CHILD

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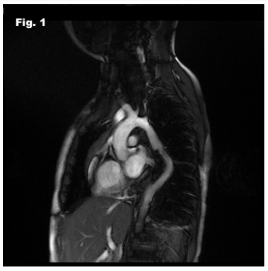
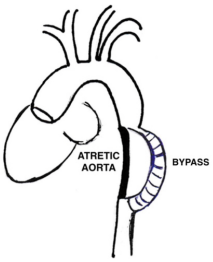
INTRODUCTION

Aortic interruption or atresia represents a rare diagnosis in adult patients. It is often an acquired atresia, resulting from a severe and long-standing AC. This type of aortic atresia is a challenge, and surgery is usually the treatment of choice to re-establish aortic continuity. Treatment by percutaneous techniques of atretic segment perforation followed by balloon dilation combined with implantation of stents is also possible today.
We describe a case of percutaneous aortic tract reconstruction, in a 9-year-old boy with acquired atresia of the thoracic aorta.

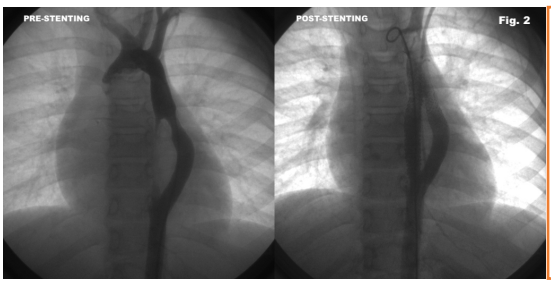
CASE REPORT

A two-year-old boy was diagnosed with a severe, tubular coarctation of the thoracic aorta, distal to the origin of the left subclavian artery.
We opted for a surgical correction by a 10-mm Gore-Tex shunt implantation.
At the age of nine years (height 130 cm, weight 29 Kg), he complained of cramps to calves after intense, prolonged efforts.
Cardiac MR showed complete lumen occlusion of the native aorta and stenosis of the shunt (Fig. 1).

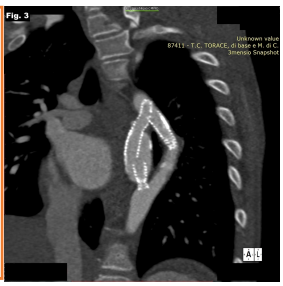




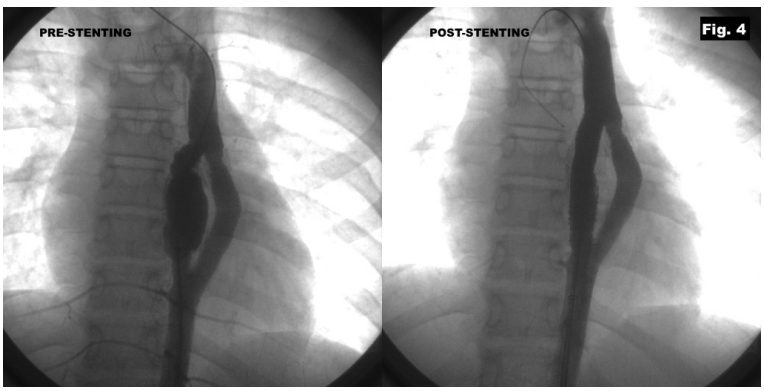
We tried to obtain reperfusion of the occluded segment gently advancing two Miracle (Asahi) Chronic Total Occlusion (CTO) guidewires both anterogradely and retrogradely. Complete crossover was obtained with the retrograde guidewire, which was then advanced to the ascending aorta. Perforation of aortic wall never occurred. Progressive pre-dilation was performed up to a final diameter of 7 mm, using coronary (Emerge 2.5 x 20 mm, Boston Scientific) and peripheral high-pressure balloons (Ghost 4 x 20 mm and Ghost 7 x 20 mm, NuMED). Angiography confirmed the absence of contrast leak.
Then, two 10-mm kissing stents (Omnilink, Abbott), inflated at a final pressure of 14 atmospheres, were implanted in native aorta and proximal portion of the bypass to obtain a total aortic lumen of twice a circular profile with a diameter of 10 mm. We implanted the two stents simultaneously in order to avoid their distortion. One more 10-mm Omnilink stent was used to complete reperfusion of native aorta. Final angiography showed an "atypical" but adequate double-lane aortic lumen (Fig. 2).



After 3 years the patient (height 155 cm, weight 42 Kg) underwent a control cardiac MR that showed proximal migration of the upper stent implanted in the atretic aorta, loss of overlap between the two stents, and the presence of a large aneurysm (Fig. 3).



Therefore, the child underwent cardiac catheterization during which we implanted a single 6 cm-long covered stent (Bentley BeGraft 10x59 mm) that excluded the aneurysm. We also dilated the proximal stented portion of the bypass with a high-pressure PTA Balloon (BiotroniK Passeo-35 HP 10x40 mm). The obtained result is satisfying and hopefully definitive (Fig. 4).



DISCUSSION AND CONCLUSION

Acquired aortic atresia is an uncommon congenital anomaly.
In the past, the standard treatment had been surgical repair, preferably with an extra-anatomical bypass. Today many patients are treated successfully by percutaneous approach. However, major interventions on growing structures in children should not be considered definitive, and a careful follow-up remains mandatory in order to early detect possible complications and to treat, as we did, life-threatening conditions.