

El-Kuffash et al.⁵ reported late closure of PDA with intravenous paracetamol at a dose of 60 mg/kg/day, divided in 4 doses. Oncel et al.⁶ reported the results of a randomized controlled trial in preterm infants treated with oral paracetamol in whom closure PDA was achieved with no complications.

Even though there are studies about paracetamol with different doses and routes of administration, due to the dire clinical situation of the patients in our study, we started intravenous paracetamol at a dose of 15 mg/kg/QID for 3 days in infants B and C. The infant with the lowest GA (infant A) received paracetamol for 6 days. Infant A was also the patient in whom treatment was started after the second week of life. Despite the delayed treatment, PDA closure was achieved.

As reported by Hammerman et al.,³ severe thrombocytopenia was the most frequent reason for contraindicating ibuprofen.

According to the literature reported to date and our findings, hypertransaminasemia was the only adverse effect observed and no treatment was required.

Finally, paracetamol appears to be a promising new alternative to indomethacin, ibuprofen, and surgery for closing PDA with possibly fewer adverse events, although a limited number of infants have been studied. Nevertheless, in view of a recent report about adverse events on the developing brain of mice, long-term follow up to at least 24 months of postnatal age must be considered.

It is important to consider the possibility that paracetamol may be effective in the treatment of late PDA and could be an alternative to PDA ligation in patients with a contraindication to ibuprofen or indomethacin. The potential adverse effects of ibuprofen and indomethacin make paracetamol an attractive alternative pharmacological treatment.

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Percutaneous Recanalization of Complete Inferior Vena Cava Occlusion in CTGA Repaired With the Mustard Technique



Recanalización percutánea de obstrucción completa de vena cava inferior en TCGA reparada con técnica de Mustard

To the Editor,

Dextro-transposition of the great arteries (DTGA) is a congenital heart defect characterized by ventriculoarterial discordance, in which the aorta originates at the right ventricle and the pulmonary artery at the left ventricle. The prevalence of this condition is estimated to be between 4 and 6 per 10 000 live newborns, accounting for approximately 20% of all cyanotic congenital heart diseases.^{1,2} Corrective surgical techniques have advanced over the years from intra-atrial correction (Senning and Mustard) to arterial switching (Jatene), with this latter technique being the technique of choice today.^{3–5} One of the most common complications of intra-atrial correction is stenosis where the venae cavae enter the right neatrium.⁶

We present the case of a 32-year-old woman with DTGA and an intact septum. The Blalock-Hanlon and Blalock-Taussig procedures were performed in the neonatal period, with subsequent anatomical correction with the Mustard technique at the age of 2 years. In subsequent follow-up, sinus dysfunction was observed and, in recent months, the patient complained of dyspnea on moderate effort with reduced functional capacity and desaturation during exercise stress testing.

Cardiac magnetic resonance showed significant stenosis in the superior vena cava (SVC) and the inferior vena cava (IVC), as well as

substantial collateral circulation with a very dilated azygos vein. Catheterization revealed moderate stenosis of the SVC (with a mean gradient of 3-mmHg between the right neatrium and the SVC), complete occlusion of the IVC, and bilateral iliofemoral venous thrombosis. During the catheterization procedure, a 45-mm Cheatham Platinum (CP) stent was implanted over a 22-mm Balloon

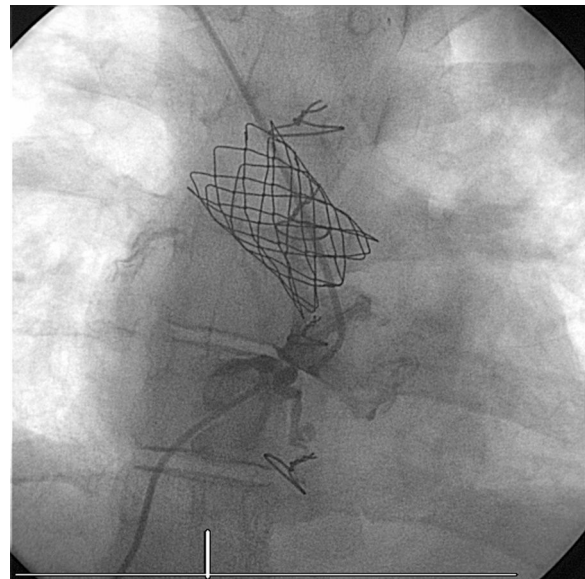


Figure 1. Catheters with access via the jugular and transhepatic veins, either side of the occlusion of the inferior vena cava.

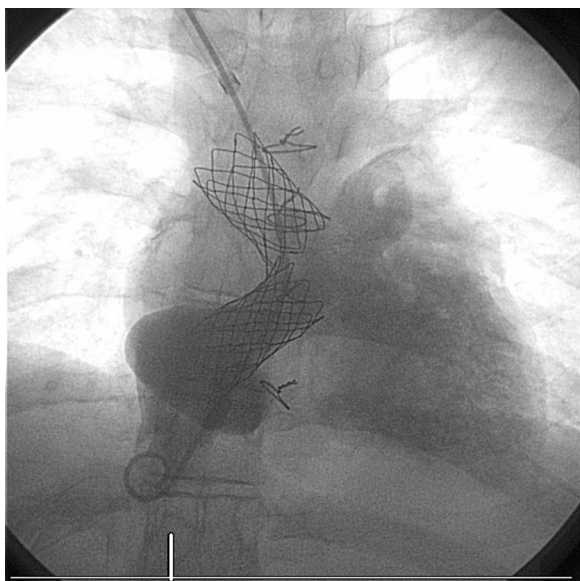


Figure 2. Final outcome: stents in the superior vena cava and inferior vena cava with adequate caliber and good flow.

intraballoon (BIB) in the stenotic region of the SVC with disappearance of the gradient and improvement of the anterograde flow. After catheterization, the patient had an episode of atrial flutter that was reverted with amiodarone. Abdominal echocardiography showed heterogeneity of the hepatic parenchyma. On discussion of the case, it was decided to attempt percutaneous recanalization of the complete occlusion of the IVC.

A new interventional procedure was scheduled with the collaboration of the interventional vascular radiology department for transhepatic access to the IVC (5F introducer). The right neoatrium was probed from the right jugular vein and the catheters introduced via the 2 venous accesses (jugular and transhepatic) were placed on either side the occlusion with biplanar fluoroscope (Figure 1). A 0.0014 Nykanen radiofrequency wire was used to perforate the atretic segment from the IVC and captured with a loop catheter to form a venovenous loop. Progressive dilatation of the stenotic region was performed with balloon catheters (Evercross 5, 9, and 12 mm diameter) before subsequent 45-mm CP stent implantation over 18-mm BIB with a 12F sheaf introduced via the right jugular vein. The final angiography showed that the caliber of both stents was satisfactory with good flow (Figure 2). Hemostasis was performed by compression. The fluoroscopy time was 52.8 minutes. The patient was discharged after 48 hours with no complications and her functional class improved during follow-up.

Vascular complications in patients with DTGA who have undergone the Mustard correction are very common and potentially serious. This case illustrates an exceptional situation, that is, complete occlusion of the IVC with no possibility of venous access through the femoral veins, along with use of uncommon

techniques for resolving such problems: use of radiofrequency guidewires and transhepatic venous access.

In the follow-up of patients with corrected congenital heart disease, diagnostic imaging tests (magnetic resonance imaging and computed tomography) provide valuable additional information to that provided by echocardiography. Between September 2006 and February 2016, 40 interventional procedures were performed in our center on 35 patients with DTGA who had undergone the Mustard technique. In 10 of these, complete occlusion was observed in the SVC or IVC ($n = 7$ and $n = 2$, respectively). Although perforation with a rigid 0.14" guidewire was successful in 7 of 10 patients, we believe that the use of radiofrequency guidewire can increase the success rate in percutaneous recanalization of venous vessels. The use of diagnostic imaging tests (such as magnetic resonance imaging) in the follow-up of these patients can help in the early detection of stenosis of venous vessels.

Collaboration between multidisciplinary teams, use of transhepatic access, biplanar fluoroscopy, and use of perforation techniques with radiofrequency (designed for use in neonatal heart disease), although not authorized in this indication, can be extremely useful in the most complex cases.

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