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Stenting of the aortic arch as an emergency palliation of aortic dissection after cardiac surgery in an infant

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MeSH: aortic disease, stents, heart defects, congenital

Introduction

Aortic dissection with low cardiac output is an acute emergency and immediate therapy is mandatory. It is however a disease of the elderly. We report on an infant who developed acute aortic dissection following cardiac surgery, for whom stent implantation was performed.

Case Report

A 6 month old infant with hypoplastic left heart syndrome, who had previously undergone a Norwood procedure, was admitted for stage 2 palliation with a superior vena cava to pulmonary artery shunt. Aortic cannulation was performed using a 3.0 mm cannula, for induction of cardiopulmonary bypass. The cannula was inserted into the native tissue of the reconstructed arch. After initial cannula insertion, no bleedback was noted, and the cannula had to be inserted for a second time. Thereafter, the surgical procedure was routinely performed. Weaning off bypass was uneventful, and the sternum was closed in a normal fashion. Ten minutes after chest closure there was no blood pressure measurable in the femoral artery, while the pulses were normal in the upper limb. At echocardiography there was no detectable flow in the descending aorta, but further details could not be discerned.

Emergency cardiac catheterization, performed via the femoral vein and artery demonstrated a dissection of the aortic arch, starting in the transverse arch (Fig. 1). Because of the critical clinical state of the patient it was decided to undertake emergency palliation by percutaneous stent implantation. Via an 0.035“guidewire in the aorta, inserted from the right femoral vein, two premounted Palmaz (8mm diameter each) were inserted in series, to cover the dissection flap.

This resulted in good angiographic patency of the arch, with normal lower limb blood pressures again being recordable. Despite restoration of appropriate arch patency and adequate urine output, the patient died 24 hours later with multi-organ failure. A post mortem study was not performed.

Figure 1 Contrast injection into the aorta after retrograde approach from the left femoral artery (postoperative blood pressure monitoring). there is a stop of contrast in the descending part of the arch due to an acute dissection.

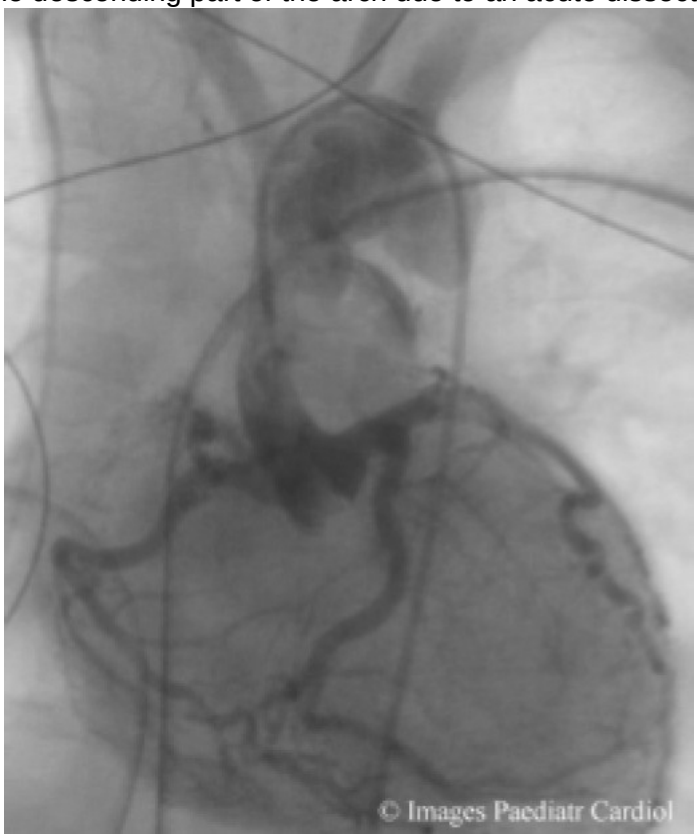

Figure 2 The dissection flap has been stabilised with two stents in series (Palmaz Genesis 8 mm). For stent implantation the aorta was reached antegradely through the anatomical right ventricle.

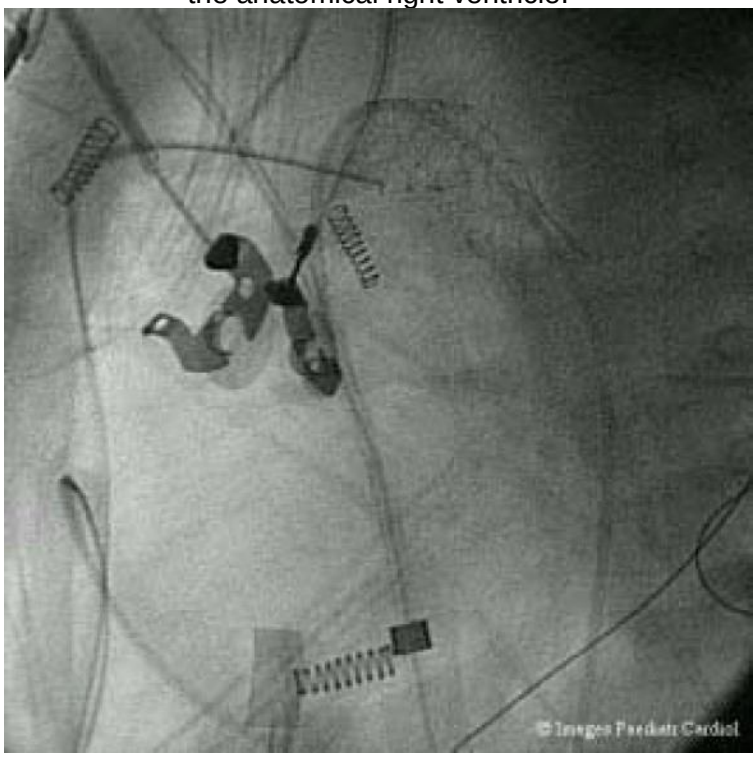

Figure 3 Contrast injection into the aortic arch after stent implantation, demonstrating unobstructed flow into the descending aorta.

Discussion

Aortic dissection in infancy is rare,[1,2] and when it occurs, the aetiology is either trauma or iatrogenic. There is no recommended standard treatment. In our patient, reopening of the sternum and recommencement of cardiopulmonary bypass was not considered to be an appropriate option, due to the critical clinical state of the patient. Stent implantation resulted in excellent immediate palliation. The mechanism of dissection was possibly related to initial cannulation, which resulted in a tear of the native aortic tissue and intramural bleeding.[1,3,4] Although the patient died 24 hours later, this was not a direct result of residual aortic obstruction but from preceding events.

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