

Proximal aortic stent migration

E. Moltzer · M. Ouhlous · J. W. Roos-Hesselink ·
A. J. J. C. Bogers · M. Witsenburg

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Case

A 21-year-old man underwent stent implantation (8Z45CP stent on 18 mm BiB-balloon, Numed, Hopkinton, NY) for a recurrent aortic obstruction, after previous repair of an aortic interruption type A. At the age of two weeks after birth an end-to-side anastomosis of the descending aorta onto the distal arch (left subclavian artery) was performed. Diagnosis of restenosis was based upon upper limb hypertension, a diastolic run-off with echo-Doppler, and an invasive systolic gradient of 36 mmHg (Fig. 1). Stenting was followed by post-dilatation with a 20 mm high pressure balloon. The peak systolic gradient decreased from 15 to 0 mmHg and the diameter increased from 11 to 17 mm (Fig. 1). One year later, transthoracic echocardiography (TTE) suggested a more proximal position of the stent, which was confirmed with a CT scan (Figs. 2 and 3). Systolic gradients were

measured during diagnostic catheterisation (Fig. 1) and with angiography the position of the stent was further visualised. The case was discussed within our team and with external experts. Two treatment options were considered. One option was fixation of the stent with one or two distal stents including redilatation of the narrowed segment. The second option was surgical removal of the stent with reconstruction of the aortic arch. Although the votes were divided, surgical intervention was our preferred approach. At surgery the stenotic part of the aorta was resected and the stent removed. In the ascending aorta an unexpected ulceration due to an eroding effect of the proximal stent end was found. This potentially lethal lesion was included in the resection as well. Aortic arch reconstruction was performed with interposition of a 24 mm vascular graft between the ascending and descending aorta, with replantation of the subclavian artery in the prosthesis. Surgery was successful and postoperative recovery was uncomplicated (Fig. 2). Four years after surgery no further complications occurred and the patient was normotensive without medication. The anatomical situation assessed with CT was excellent (Fig. 3).

E. Moltzer · J. W. Roos-Hesselink
Department of Cardiology, Thoraxcenter, Erasmus Medical Center, Rotterdam, the Netherlands

E. Moltzer
Division of Pharmacology, Vascular and Metabolic Diseases,
Department of Internal Medicine, Erasmus Medical Center,
Rotterdam, the Netherlands

M. Ouhlous
Department of Radiology, Erasmus Medical Center, Rotterdam,
the Netherlands

A. J. J. C. Bogers
Department of Cardio-thoracic Surgery, Thoraxcenter, Erasmus
Medical Center, Rotterdam, the Netherlands

M. Witsenburg (✉)
Department of Cardiology, Thoraxcenter, Erasmus medical Center,
Room Ba583, PO Box 2040, 3000 CA, Rotterdam, the Netherlands
e-mail: m.witsenburg@erasmusmc.nl

Discussion

Over the last years, aortic stenting is becoming more popular for the treatment of native or recurrent aortic coarctation (COA) in older children and adults as an alternative to surgical treatment [1]. Although the blood pressure gradient decreases and vessel diameter increases, hypertension might persist and serious complications can occur [2]. Migration of an aortic stent for recurrent or native COA is not uncommon. In a large multi-institutional study including 565 procedures for recurrent obstruction or native COA, stent migration was reported as the most frequent technical complication, occurring in 5 % of the procedures [3]. These were

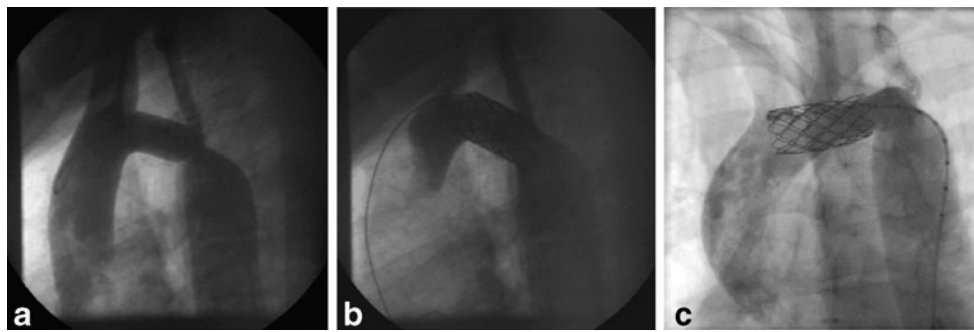


Fig. 1 Aortic angiography **a** Lateral projection of the aortic arch before stent implantation, demonstrating the local narrowing in the distal aortic arch, followed by a post-stenotic dilation of the descending thoracic aorta. **b** Lateral projection of the aortic arch

immediately after stent implantation. **c** LAO projection of the aortic arch at follow-up. The stent has migrated to the transverse arch and is proximally free from the aortic wall

Fig. 2 Transthoracic echocardiography **a** Before surgical reconstruction with proximally migrated stent (*white arrow*) and the narrow aortic arch (*dotted arrow*). **b** Follow-up after surgical aortic arch reconstruction with a vascular graft (*arrow*)

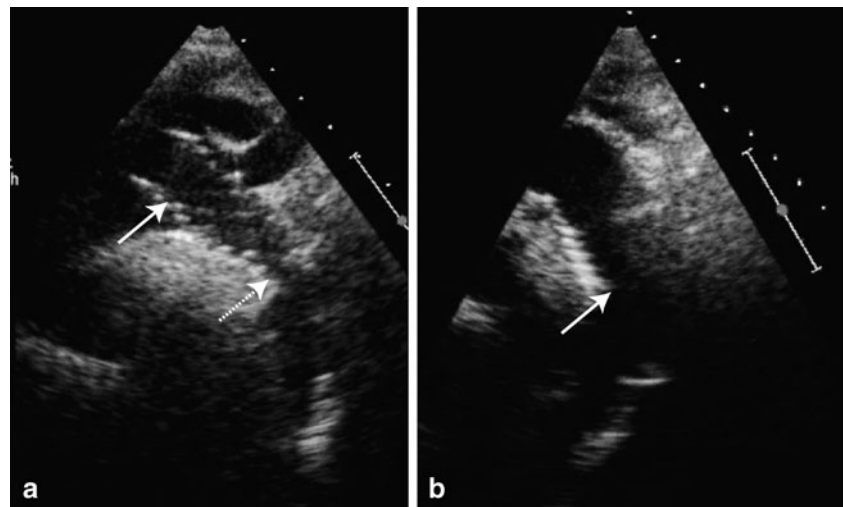
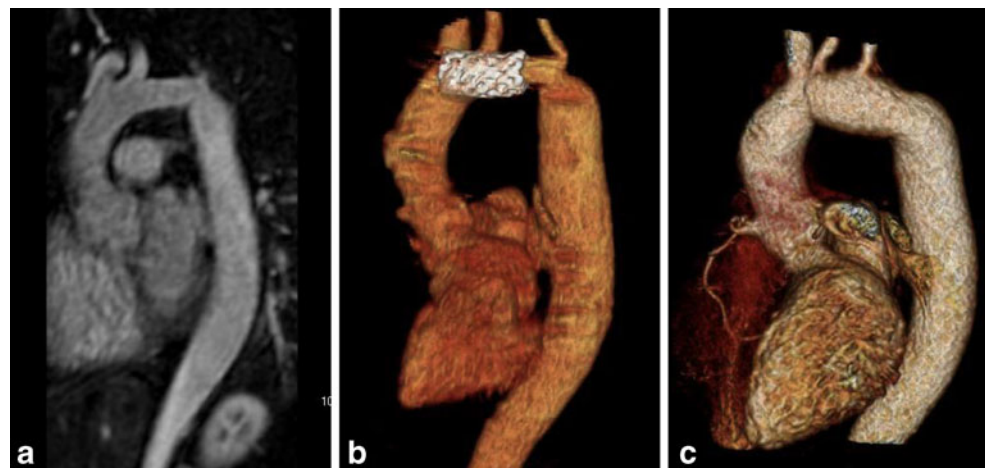


Fig. 3 MRI and CT images **a** MRI showing a narrowing of the aortic arch before intervention. **b** CT scan demonstrating the proximal relocation of the aortic stent and more distally the aortic narrowing. **c** CT scan at follow-up 4 years after surgery with a vascular graft shows no aortic narrowing or dilatation



all immediate stent migrations, and stents generally moved in an antegrade fashion in the direction of the flow to a more distal position in the descending aorta. Such a complication can be corrected either by repositioning of the stent or deployment of the stent in the descending aorta, followed by new stent implantation at the site of stenosis or coarctation [3–5]. The occurrence of late migration has been reported sporadically. For example, one asymptomatic delayed stent migration was detected 3 weeks after the procedure and was displaced distally [6]. Pilla et al. described two cases of late stent migration: one showed slight distal migration, associated with small aneurysm formation, but the stent was still covering the COA site, the other was found in the abdominal aorta, and a new stent implantation was required [7]. These authors suggest that late stent migration probably occurs early after implantation, but is detected later during follow-up. Therefore, accurate imaging is necessary before discharge and during follow-up. To our knowledge, retrograde migration of an aortic stent for COA into the ascending aorta has only been reported once. In a 15-year-old girl, a stent was placed for recurrent COA; during final pressure measurement the stent was dislodged and moved into the ascending aorta, just above the aortic valve. The stent was removed surgically and the aortic arch was reconstructed with a patch [8]. In our patient the decision for a surgical approach was based upon the concern for the presence of the stent in the transverse arch, with a possible risk of cerebral embolisation of vascular tissue fragments during a new catheter intervention. Also the sharp angle in the distal arch made it unattractive for placement of rigid and overlapping stents, which probably would not result in a nice curved distal aortic arch.

Conclusion

We describe a unique case of proximal aortic stent migration 1 year after implantation in a patient with recurrent COA. This case stresses the necessity for careful follow-up with various imaging techniques. In addition it illustrates the need for the development of large stents that combine good

radial strength with more flexibility for use in curved vessels. It also illustrates that an inappropriately positioned stent may result in a potentially life-threatening eroding aortic lesion and that surgical reconstruction of the aortic arch was safe and sound. This should be taken into account in the decision for surgery versus a new catheter intervention in similar cases.

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Conflict of interests None declared.

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