Complete endovascular treatment of acute proximal ascending aortic dissection and combined aortic valve pathology

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Acute aortic dissection type A (AADA) is a life-threatening disease and potentially one of the greatest challenges in cardiac surgery.¹ Particularly, older patients or those with severe disease are often denied surgery because of a prohibitive surgical risk. Several small series have already described endovascular approaches for the treatment of AADA and other serious pathologies of the ascending aorta.²⁻⁴ The case reported here adds a simultaneously performed transcatheter aortic valve implantation procedure to the endovascular treatment of a type II DeBakey aortic dissection in a single completely endovascular procedure.

FIGURE 1. A, Preoperative computed tomography scan revealing acute type II DeBakey aortic dissection and calcified aortic valve. B, Predischarged computed tomography showed a good result with only a small residual type 1b endoleak at the distal landing zone. C and D, Repeated computed tomography after 6 months revealed a stable result.

CLINICAL SUMMARY

We report the case of an 82-year-old man with AADA who also had severe aortic valve stenosis (Figure 1, A). The extent of the dissection was limited to the ascending aorta by a type II DeBakey aortic dissection, with the assumed entry being localized in the supracoronary part of the ascending aorta. No evidence was seen of a reentry in the aortic arch. Coronary involvement was ruled out by computed tomographic scan and transesophageal echocardiography. Measurements for defining the stent size were based on preoperative computed tomographic angiography. The patient's medical history particularly included a short-bowel syndrome as a consequence of multiple previous resections of the small intestine. The patient therefore underwent long-term treatment with medical coal and silver. Further relevant comorbidities consisted of chronic kidney disease, chronic lung disease, diabetes, and history of stroke. The broad spectrum of relevant comorbidities resulted in an excessive surgical risk, so the patient was denied conventional surgery. As a bailout, we decided on a complete endovascular approach through a transfemoral access by means of an endovascular Wheat procedure. At first, endovascular repair of the ascending aorta was performed, aiming to generate a proximal landing zone for the transcatheter heart valve. For those purposes a Relay NBS (Bolton Medical Inc, Sunrise, Fla) thoracic stent-graft (proximal diameter of 34 mm, distal diameter of 34 mm, length of 109 mm, introducer sheath size of 23 mm) was used. During stent deployment, rapid pacing was used. Subsequently, transfemoral transcatheter aortic valve implantation was performed with a 29-mm Medtronic CoreValve (Medtronic, Inc, Minneapolis, Minn). The CoreValve was positioned with the upper parts of the valve stent landing in the proximal part of the thoracic stent-graft. Guidance during the whole procedure was performed with 2- and 3-dimensional transesophageal echocardiography as well as classic and

digital subtraction angiography. The procedure itself was uneventful, and the patient recovered quickly during the further postoperative course. PredischARGE computed tomography demonstrated a small type 1b endoleak at the distal landing zone (Figure 1, B), which was stable according to a computed tomographic image obtained 6 months after the operation (Figure 1, C and D).

DISCUSSION

This case demonstrates the feasibility of a combined, completely endovascular approach for treatment of AADA and concomitant aortic valve pathology. Suitable pathology is restricted to type II DeBakey aortic dissection with an entry in the supracoronary part of the ascending aorta and no further reentries in subsequent aortic sections. Although this clinical configuration remains a rarity, this approach offers a viable bailout strategy for selected corresponding patients at highest risk. Composite endovascular devices, currently in development, may further facilitate this approach in the near future.⁵

References

1. Rylski B, Hoffmann I, Beyersdorf F, Suedkamp M, Siepe M, Nitsch B, et al; Multi-center Prospective Observational Study. Acute aortic dissection type A: age-related management and outcomes reported in the German Registry for Acute Aortic Dissection Type A (GERAADA) of over 2000 patients. *Ann Surg*. 2014; 259:598-604.
2. Vallabhajosyula P, Gottret JP, Bavaria JE, Desai ND, Szeto WY. Endovascular repair of the ascending aorta in patients at high risk for open repair. *J Thorac Cardiovasc Surg*. August 4, 2014 [Epub ahead of print].
3. Roselli EE, Idrees J, Greenberg RK, Johnston DR, Lytle BW. Endovascular stent grafting for ascending aorta repair in high-risk patients. *J Thorac Cardiovasc Surg*. 2015;149:144-54.
4. Preventza O, Henry MJ, Cheong BY, Coselli JS. Endovascular repair of the ascending aorta: when and how to implement the current technology. *Ann Thorac Surg*. 2014;97:1555-60.
5. Rylski B, Szeto WY, Bavaria JE, Branchetti E, Moser W, Milewski RK. Development of a single endovascular device for aortic valve replacement and ascending aortic repair. *J Card Surg*. 2014;29:371-6.