

Surgical technique for acute retrograde type A aortic dissection after zone 2 TEVAR for complicated type B dissection in a 63 year old patient

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Abstract

Patients suffering retrograde type A dissection after TEVAR for type B dissection are at a higher risk of mortality than their spontaneous counterparts and the kind of optimal therapy remains obscure. We present a rare case of successful open surgical repair where distal open anastomosis was accomplished cutting off the un-covered stent portion and suturing a vascular prosthesis to the dissected distal aortic arch including the covered stent part. The clinical course was regular. Immediate and radical repair in the aortic arch may be the adequate response in such instances.

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Surgical technique for acute retrograde type A aortic dissection after zone 2 TEVAR for complicated type B dissection in a 63 year old patient

Short title:

Retrograde type A after type B dissection

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Patient consent: The patient gave written consent to publication of clinical case details and images.

Abstract:

Patients suffering retrograde type A dissection after TEVAR for type B dissection are at a higher risk of mortality than their spontaneous counterparts and the kind of optimal therapy remains obscure. We present a rare case of successful open surgical repair where distal open anastomosis was accomplished cutting off the un-covered stent portion and suturing a vascular prosthesis to the dissected distal aortic arch including the

covered stent part. The clinical course was regular. Immediate and radical repair in the aortic arch may be the adequate response in such instances.

Key words:

Retrograde type A dissection, TEVAR, type B dissection

Conflict of interest statement:

All authors disclose any potential conflict of interest.

Text:

Patients developing retrograde acute type A dissection after TEVAR for complicated type B dissection display higher morbidity and mortality than in spontaneous acute type A dissection.¹ The kind of optimal therapy remains obscure and both open versus interventional angiographic repair may be considered. In cases of pericardial tamponade open surgery may solve the problem. We present a case of successful open surgical repair including total replacement of the aortic valve, root, ascending aorta and arch until zone 2. In this particular instance, the distal open anastomosis was accomplished by cutting off the un-covered stent portion protruding into zone 0, and by suturing a vascular prosthesis to the dissected distal aortic arch including the covered stent part into the stitches.

Case presentation: At the time of acute complicated type-B dissection, urgent debranching by a left carotideo-subclavian bypass and zone 2 TEVAR using two Cook stentgrafts (one tapered 40-36 mm, one straight 36 mm) were performed. Procedural success was documented by CT scan showing false lumen thrombosis and the patient discharged without any complaints thereafter. Three weeks later the patient presented to the hospital with severe chest pain and a CT scan was immediately obtained. Acute retrograde type A dissection was diagnosed involving the aortic root, the ascending aorta and the arch. (Figure 1) Rapidly, the patient developed high-grade aortic insufficiency and pericardial tamponade and was immediately sent for surgery.

A valve-replacing full root replacement using a stentless all-biological graft (BioIntegral 25 mm) and an ascending and total arch replacement (Hemashield vascular graft 28 mm) were performed. Two supra-aortic arch vessels were reimplanted together (brachiocephalic trunk, left common carotid) using a common island technique. Distal open anastomosis was accomplished in zone 2 after resecting the bare metal ends of the stent graft using scissors. By a double 3-0 prolene running suture the Dacron graft was connected to the distal arch including the covered portion of the stent. The drawing illustrates the suturing technique (Figure 2). After an uneventful course the patient was discharged and recovered fully. Postoperative CT imaging one week, 6 and 11 months after surgery shows a stable procedural success. (Figure 3) Follow-up echocardiography showed a regular valve function. Meanwhile, the patient has returned to work and resumed driving motorcycle.

Discussion: Retrograde type A dissection after TEVAR occurs at 2.5% and frequency is higher in patients following TEVAR for type B dissection compared to aneurysm repair.¹ Mortality remains a major issue, with values ranging from 37 to 50%. ²When bail-out re-do TEVAR in the arch is not feasible, open repair becomes necessary. No recommendations with respect to anastomotic technique in the arch have been made so far, but it can principally either include removal of the TEVAR stent graft from the native aorta or its preservation within. In cases with bare metal ends extending to the proximal arch, an anastomotic suture problem exists. In the present case, cutting off the bare metal ends and including the covered stent part into the suture line resulted in excellent hemostasis. Follow-up in similar cases and scientific reporting is desirable.

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Figure legend:

Figure 1: CT showing the thrombosed false lumen*, the acute retrograde type A dissection** and the aortic root (AR). Angulation: LAO 64deg.

Figure 2: Scheme of anastomotic suturing technique.

Figure 3: Postoperative CT scan 11 months after surgery showing the anastomosis* and aortic root (AR). Angulation: LAO 58deg.

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