Regarding “Kommerell’s diverticulum and right-sided aortic arch: A cohort study and review of the literature”

We read with interest the recent (J Vasc Surg 2004;39:131-9) and previous1 reviews by Cina et al describing the approach to patients with a Kommerell’s diverticulum and a right-sided aortic arch. A similar case previously published in the Journal by our group2 is cited in the recent article, although some features are not reported while others are outlined incorrectly.

Our patient presented with severe dysphagia and milder compression symptoms due to an isolated Kommerell’s diverticulum—ie, very unusually, with no vascular ring—and a right-sided aortic arch. The origin of the supra-aortic vessels corresponded to Edward’s type I (mirror image). The lesion was diverticular rather than aneurysmal and measured 3 cm in diameter, but extended posteriorly for 6.5 cm between the aorta and the esophagus (not described). Because a true Kommerell’s diverticulum in the presence of a right-sided arch represents a remnant of the left dorsal aorta, it can be speculated that, embryologically, the anomaly comprised a right arch with a retroesophageal left ductus arteriosus,3,4 and that progressive closure of the ductus after birth determined an aortic segment—ie, the ligamentum arteriosum proper and the posterior left portion of the vascular ring—along with a Kommerell’s diverticulum originating from the aortic isthmus (Fig); differentiation from double aortic arch with left arch atresia distal to the left subclavian artery is virtually impossible although in the latter condition the left innominate artery is tethered caudally and more horizontal. This specific anatomy closely resembles that described by Cina in Case 1 prior to reoperation, in a patient who underwent previous division of the ligamentum arteriosum and of an aberrant subclavian artery through the left chest.

In our case the diverticulum’s root was divided on a side-biting clamp, with no clamp-and-go, avoiding excessive mobilization posterior to the esophagus because of the adherent and fragile nature of the surrounding tissues. Although this technique has not been previously described, it is worth mentioning that tangential clamping and direct suture was straightforward, probably because, in the absence of an aberrant subclavian artery, the surrounding aorta was relatively normal and non-aneurysmal.

We agree that distal perfusion is preferable to a clamp-and-go technique if aortic cross clamping is necessary. The idea of performing left heart bypass with left atrial drainage through the right chest is appealing, and the technique can safely be converted to full cardiopulmonary bypass if required.

Except for potential applications of endovascular stent grafting,5 we concur that a right posterolateral thoracotomy through the 4th intercostal space, with or without rib resection, is the best approach to a right-sided upper descending aorta. We also strongly agree that an aberrant subclavian artery should be transposed and reimplanted or bypassed rather than divided, and that a combined cervical-thoracic strategy is preferable to an extended entirely thoracic approach; in this respect, we would like to stress that we did not perform a sternothoracotomy.

Finally, although it refers to a combined cervical-thoracic operation,6 the article cited in the references is not our previously published paper in this Journal.7

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Schematic diagram of the developmental anatomy in a case of Kommerell’s diverticulum without a perfused vascular ring and a right-sided aortic arch (frontal view, with the diverticulum displaced downward for explanatory purposes). The left aortic arch distal to the left subclavian artery may be atretic (dotted line) or absent. IA, innominate artery; RCC/LCC, right and left common carotid; RS/LS, right and left subclavian; RPA/LPA, right and left pulmonary artery; RLLA, retroesophageal left ligamentum arteriosum; K, Kommerell’s diverticulum.

REFERENCES


Reply

I would like to thank Dr Pocar and colleagues for providing clarification to the article they published in the Journal in 1997, and for pointing out a referencing error. Since their work did not provide angiographic or computerized tomographic images, it is difficult to interpret the anatomy of their case without the benefit of the drawing that the authors now enclose. Pitfalls in diagnosis and interpretation of these anomalies are well described.1

In addition, the line drawing shows an aneurysm located well below the level of the pulmonary artery. This is very unusual in right-sided arches with a Kommerell’s diverticulum and an aberrant subclavian artery. In this anomaly the diverticulum or the aneurysm is at or above the level of the pulmonary artery. It is perhaps because of the very unusual location of the diverticulum in
their case that they could use a side-biting clamp and excise it from a right thoracotomy.

I do not believe, however, that this approach can be used for the repair of Kommerell’s diverticula/aneurysms with an associated aberrant subclavian artery. For this condition we both agree that a subclavian-carotid transposition followed by a right thoracotomy and repair with atriofemoral bypass provides the most favorable approach.

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REFERENCES

Local treatment of Dacron patch graft infected with biofilm-producing Staphylococcus epidermidis using antibiotic-releasing porous apatite ceramic: An experimental study in the rabbit

Some Staphylococcus epidermidis strains produce an extracellular glycocalyx called biofilm and exhibit a high resistance to antibiotics due to this biofilm.1,2,3 We previously reported the efficacy of local treatment with antibiotics-releasing apatite ceramic (TCP) for prosthetic graft infection by S aureus;4,5 Usually S aureus does not produce biofilm. Afterwards, we extended our new treatment method to the other major prevalent pathogen, biofilm-producing S epidermidis.

S epidermidis, American Type Culture Collection 35984, was used as the infecting organism. Teicoplanin (TEIC, Aventis Pharma S A, Germany) was used as the antibiotic. The minimum inhibitory concentration of TEIC for S epidermidis was 2 mg/mL.

By using the same technique of our previous reports, Dacron grafts were patched in the anterior wall of the abdominal aorta of the rabbits. These animals were divided into the following four groups: (1) the NS group (n = 6), a no-treatment group with a sterile prosthetic vascular graft; (2) the NB group (n = 8), a no-treatment group with a prosthetic vascular graft infected with S epidermidis; (3) the TA group (n = 6), a group with a prosthetic vascular graft infected with S epidermidis, treated two weeks after the operation with TEIC (100 mg) locally administered on the graft; and (4) the TT group (n = 6), a group with a prosthetic vascular graft infected with S epidermidis, treated two weeks after the operation with TEIC-loaded TCP placed on the infected graft. The TT group received the same amount of TEIC (100 mg) as the TA group.

Four weeks after the first operation, all the patched graft was removed from the abdominal aorta and cultured after its sonication. Cotton swabs of perigraft fluid and of the graft surface, tissue around the prosthetic vascular graft, and arterial blood were cultured. In the NS group, no bacteria were recovered by all culturing methods in all animals. In the NB group, perigraft effusion and poor graft incorporation were recognized in 5 of 8 (65%) animals. S epidermidis was recovered in 6 of 8 (75%) animals by sonication. In the TA group, all animals had normal anastomosis and normal graft incorporation. S epidermidis was recovered in 5 of 6 (83%) animals by sonication. In the TT group, all animals had normal anastomosis, normal graft incorporation, and no perigraft effusion. S epidermidis was not recovered in any animals. Significant differences in the infection rate were found between the NB group and TT group (P < .01) and between the TA group and the TT group (P < .05) (Fig).

We found similar effectiveness against Dacron patch graft infection with biofilm-producing S epidermidis and efficacy of local treatment with antibiotics-releasing TCP for prosthetic graft infection.