TABLE 1. Proposed classification on the basis of embryologic and clinical relevance

Type A	Systemic-to-systemic shunt
1	Double-lumen aortic arch with or without arch hypoplasia or coarctation
2	With type A or B interrupted aortic arch
3	Subclavian artery from ascending aorta or as first branch of the aortic arch
Type B	Systemic-to-pulmonary shunt
1	With pulmonary obstruction
2	With systemic obstruction
3	With unrestricted systemic and pulmonary flows

from a common trunk or a common bicarotid trunk, respectively, when coexisting with a persistent fifth aortic arch. An appreciation of the nature of these aortic arch anomalies and a full understanding of the persistence of the fifth aortic arch will aid recognition and avoid confusion when encountered during either imaging or surgery.

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Reply to the Editor:

We thank Drs Oppido and Davies for their comments on our article. We respect their opinion that this entity has been previously described. Our report sought to highlight the fact that the origin of subclavian artery from ascending aorta has not been described in patients with tetralogy of Fallot. We tried to give an alternative embryologic explanation for the anomaly. The hypothesis proposed by Moes and colleagues¹ is a plausible explanation.

Some features in our patient pointed to a double arch: higher location of the right aortic arch and crossing of left bronchus by the proximal left subclavian artery. In addition, tetralogy of Fallot, as in our case, is the most common congenital heart disease associated with double aortic arch.²

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Traumatic rupture of the aorta in children—stenting or surgical intervention? A word of caution

To the Editor:

We read with interest the article entitled “The effect of changing presentation and management on the outcome of blunt rupture of the thoracic aorta.”¹ We commend the authors for their work. We agree with them that the nature and the management of traumatic rupture of the aorta (TRA) is changing. The authors stated that “Currently, we consider all patients to be candidates for endograft approaches if the anatomy is suitable” and concluded by stating that “As

newer devices are studied, the endovascular stent grafts might very well ultimately become the primary treatment of choice at all centers.” This is where we would like to sound a word of caution with regard to TRA in children. We agree with the proposed guidelines by Kouchoukos and colleagues.² A new technique involves uncertainty and risk. The pressure for rapid adoption can lead to deviations from the fundamental principles of surgery, which might compromise the quality and safety of patients.² As the technology evolves, there is a danger of subjecting younger patients to stent grafting.

The incidence of TRA in children ranges from 0.1% to 1% of all children with major chest injuries, and their management is a challenge. The experience of most centers is limited to a few case reports. Pediatric patients differ from adult patients in that significant intrathoracic injury can occur in the absence of rib fracture because of the increased compliance and elasticity of the chest wall. The key to management is to maintain a high index of suspicion in cases of high-speed collisions.

There have been case reports of endovascular aortic stent grafts being used in younger patients.³ The known complications of stents include occlusion of the left main stem bronchus, erosions, perigraft leak, graft migration, limb ischemia, arch perforation, entrapment, infection, pseudoaneurysm, distal embolization, and femoral artery complications. The fate of the stent is unknown, and there are no long-term results.³

We recently treated a 10-year-old boy with TRA. Aortography revealed an aneurysm just distal to the left subclavian artery indicative of an acute aortic transection (Figure 1). The possibility of using an aortic stent graft was raised because there was a successful outcome in a 17-year-old boy previously. In view of this child's age and the potential uncertainties of stenting in a growing child, we decided on the operative option.

Through a left thoracotomy, left heart bypass was instituted, and end-to-end anastomosis of the aorta was performed. The patient made an uneventful recovery and was doing well at 4 months' follow-up.

We propose that TRA in children be repaired whenever feasible and that stents be reserved only as a salvage procedure. We recommend the use of left heart bypass to maintain cerebral perfusion and to minimize spinal injury. If heparin is contraindicated,

Figure 1. Aortogram performed from the right brachial route demonstrating a pseudoaneurysm of the proximal descending aorta just distal to the origin of the left subclavian artery. There is no extravasation.

cated, a clamp-and-sew technique might be a reasonable alternative, as suggested by Trachiolis and associates.⁴ In a selected group initial nonoperative management and stabilization with β -blockers while other comorbidities are addressed, followed by elective repair, might be a reasonable option.

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Reply to the Editor:

We appreciate the kind comments made by Dr Murala and colleagues, and we agree with the operative technique and indications they describe. They have highlighted an ongoing issue with respect to managing traumatic aortic disruption in a patient who has not finished growing. Not only do late complications of erosion need to be considered, but we wonder whether the stented aorta will be prevented from growing, leading in later life to possible coarctation physiology. Thus as we and others have noted, endovascular approaches to this problem need to be incorporated into an algorithm that includes open repair, medical management, or both. We would argue that endovascular stenting be considered if there are contraindications to operative repair and to medical management (recognizing that different surgeons and centers might vary in what is considered a contraindication). Furthermore, because the vast majority of pediatric patients will be candidates only for cuff extenders or contralateral limbs, these should be used only if they can be applied predominantly on the "straight" portion of the descending aorta (to minimize endoleak) and if the proximal points of endografts are not so close to the left common carotid artery that

any subsequent operation would require an anterior arch approach.

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I am afraid of using aprotinin because they say so?

To the Editor:

Cardiothoracic surgeons have become more aware of the worse outcomes associated with aprotinin after cardiac surgery, as discussed in the article by Mangano and colleagues¹ published in the *New England Journal of Medicine*. It remains an observational study that, as the authors point out, is in need of randomized studies. The main concern of the authors that has not been addressed is the analysis of a larger sample size in the aprotinin group compared with that for other antifibrinolytics. The weighted average effect of a large sample size can have a larger effect when outcomes are analyzed.

I will address further potential confounding factors by Mangano and colleagues.¹ The authors did not control for preoperative hemoglobin count. Zindrou and associates² reported on a cohort of 2058 patients and demonstrated that a preoperative hemoglobin concentration of 10 g/L or less had a 5-fold higher in-hospital mortality rate after coronary artery bypass grafting mortality rates seen in those with a higher hemoglobin concentration, despite having had blood transfusions. Maintaining a patient's hematocrit value within the normal range and avoiding extremes is important. The main surgical factor that affects outcome in coronary artery bypass grafting is anastomosis of the internal thoracic artery to the left anterior descending artery. Moreover, the absence of critical disease in other vessels also affected outcome.³ Mangano and associates¹ also provided no information about the mean number of grafts per patient, perioperative blood loss, blood-saving techniques, and "transfusion trigger." These issues are important because there is a dose-dependent association between blood transfusion and the development of severe postoperative infection and death in patients undergoing cardiac sur-