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## *Brief Report*

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# A simple method of treating seromas involving modified Blalock-Taussig shunts

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**Abstract** We treated seromas developing in two patients in relation to left-sided modified Blalock-Taussig shunts by reattaching the original graft to the descending aorta. We postulate that seromas may develop because of the large area of contact between the graft and blood. Shortening the length of the Gore-Tex graft may therefore be a feasible treatment.

**Keywords:** Systemic-to-pulmonary shunts; surgery; congenital cardiac disease

THERE CAN BE MANY CAUSES WHY FLUID ultrafiltrates through the wall of a graft, resulting in formation of a perigraft seroma, for example following construction of a modified Blalock-Taussig shunt. Possible causes include the inhibition of humoral fibroblasts, wetting of the wall of the graft, and increased porosity after handling the graft during its insertion. Various methods have been suggested to tackle this problem,<sup>1–3</sup> with variable rates of success. We report 2 patients who developed severe perigraft seromas following construction of a left-sided modified Blalock-Taussig shunt, who were treated simply by reducing the length of the graft. We suggest that the large area of contact between the wall of the graft and the blood is the likely cause of formation of the seromas.

### Case 1

A 16-month-old girl, with a diagnosis of tetralogy of Fallot with pulmonary atresia and systemic-to-pulmonary collateral arteries, underwent unifocalisation and construction of a modified Blalock-Taussig shunt on the left side. A Gore-Tex graft of 5 mm diameter was used to construct the shunt in the usual way, administering heparin intraoperatively at 1 mg/kg.

She had abnormal chest drainage, with a daily output from the drain of around 130 ml, and chest films revealed an enlarging opacity over the apex of the left lung. Three weeks after the operation, her saturation of oxygen dropped to 50%, so she was returned to the operating room, and thoracotomy was repeated. The seroma was excised and the graft was shortened to less than half its original length, reattaching the graft to the descending aorta. The “sweating” phenomenon diminished immediately. On follow-up, there was no recurrence of the seroma.

### Case 2

A baby girl with a diagnosis of tricuspid and pulmonary atresia with a hypoplastic right ventricle was treated by construction of a right-sided modified Blalock-Taussig shunt on the second day of life. Six months later, the shunt was found to be blocked, so a central shunt was constructed. At the age of 2, a left-sided modified Blalock-Taussig shunt was inserted, using a Gore-Tex graft of 5 mm diameter, to augment the pulmonary arterial blood flow so as to encourage growth of the pulmonary arterial tree. On the fifth day after insertion of the shunt, a chest film revealed an opacity over the apex of the left lung apex. The seroma grew in size over the next 2 days, so the patient was returned to the operating room, where the seroma around the graft was removed. The graft itself was cut short and reattached to the descending aorta. There was no recurrence of the seroma.

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## Comment

Formation of perigraft seromas after construction of systemic-to-pulmonary arterial shunts has been reported most commonly in the form of case reports.<sup>4</sup> The exact mechanism for formation of the seroma has yet to be clearly identified. We have encountered such seromas in our institution, and we have noted that they appear to occur more frequently in older children than in neonates. For their treatment, we have previously used fibrin glue, replacement of the graft, and topical application of thrombin and Surgicel.<sup>5,6</sup> When these methods failed, we have taken down the shunt.

In the 2 patients currently reported, we used the same implanted grafts but simply shortened them by half, reattaching them to the descending aorta. The seroma settled in both cases. It seems that the total surface area providing contact between the wall of the graft and the circulating blood may be a critical factor in the formation of seromas. This may also explain why formation of seromas is more frequent in older children than in neonates. Reduction of the length of the graft is a simple and feasible method of dealing with this problem.

Subsequent to this experience, even more recently we have encountered a patient with a chronic seroma around a blocked shunt on the right side. This

patient has a patent left-sided modified Blalock-Taussig shunt. He underwent a repeated right thoracotomy, with excision of the seroma as well as the original shunt. A new Gore-Tex graft was used, making the anastomosis to the ascending aorta. There was no formation of seroma after 6 weeks. When the shunt is anastomosed to the ascending aorta, it can be shorter than when anastomosed to the subclavian artery. In this most recent case, however, we used a new graft rather than cutting short the original one.

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