

# A Technique for the Prevention of Hoarseness during Surgery for Distal Aortic Arch Aneurysm

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**Hoarseness occurs frequently after surgery to repair distal aortic arch aneurysms when using only a median sternotomy approach. We describe a useful technique which protects the left recurrent laryngeal nerve during this procedure and reduces the incidence of postoperative hoarseness. (Ann Thorac Cardiovasc Surg 2002; 8: 193–5)**

**Key words:** hoarseness, left recurrent laryngeal nerve, distal aortic arch aneurysm

## Introduction

During surgical treatment of distal aortic arch aneurysms, it is very difficult to avoid temporary or permanent damage to the left recurrent laryngeal nerve (LRLN) when using only a median sternotomy approach.<sup>1)</sup> A surgical technique which protects the LRLN during surgery for distal aortic arch aneurysm or chronic type A aortic dissection is described.

## Technique

Total arch replacement with reconstruction of the three cerebral branches was performed for distal aortic arch aneurysm in six patients and chronic type A aortic dissection in one patient. At bronchial intubation, a Broncho-Cath™ endobronchial tube (Mallinckrodt, Ireland) was used to collapse the left lung. A standard median sternotomy was performed, and core cooling was instituted to lower the body to 25°C. During cooling, the left mediastinal pleura was incised longitudinally to enter the left pleural cavity and obtain a view of the proximal descending thoracic aorta (Fig. 1). The left chest wall was elevated with a Miltex® surgical arm (Miltex, USA). Left-

sided pericardial holding sutures were placed and then pulled to the right. In cases of saccular aneurysms which projected posteriorly or in chronic aortic dissection, it was easy to visualize the area of the proximal descending aorta where distal anastomosis would be made. If the aneurysm projected anteriorly or was of the large fusiform type, it was difficult to obtain similar access prior to circulatory arrest. After the institution of selective cerebral perfusion,<sup>2)</sup> the left lung was collapsed and the distal anastomosis to the prosthetic graft was performed in the left pleural cavity. After completion of the distal anastomosis, the prosthetic graft was pulled into the pericardial cavity through an aortic tunnel without touching the LRLN (Fig. 2), as described by Cooley<sup>3)</sup> the so called “pull through technique”. As it becomes very difficult to get a good view after this procedure, hemostasis at the distal anastomosis and the inside of the aortic tunnel should be obtained before this procedure. Reperfusion of the visceral organs was resumed via one branch of the prosthetic graft. Coronary reperfusion was resumed after completion of proximal anastomosis. Finally, reconstruction of the three cerebral branches was performed during pump rewarming.

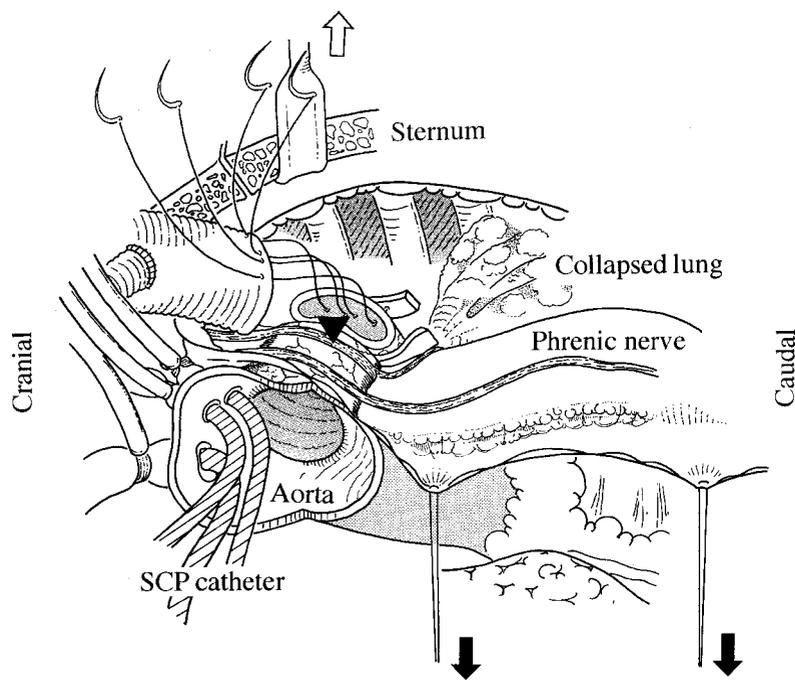
## Comment

During surgery for distal aortic arch aneurysm, the LRLN is exposed and in danger of damage. LRLN palsy is a major factor in prolonged postoperative intensive care unit stays for respiratory care.<sup>4)</sup> Furthermore, the hoarseness that results is a daily inconvenience in the patient’s life after surgery. The risk of LRLN damage is the same

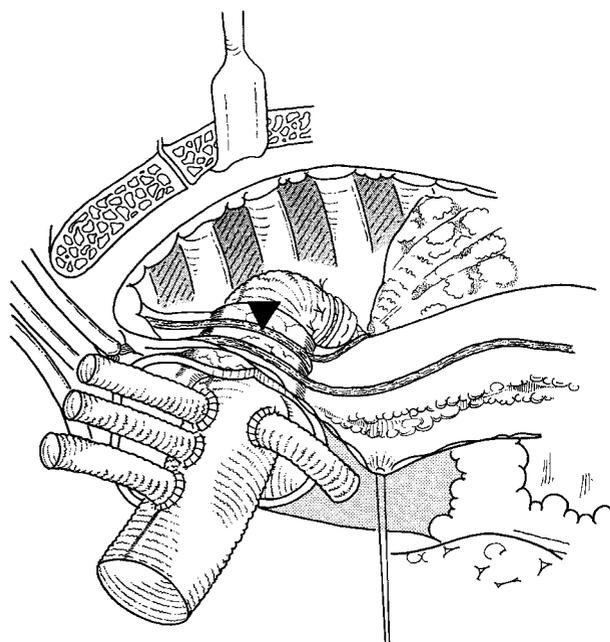
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**Fig. 1.** The left chest wall is lifted by a Miltex® surgical arm (↑) and the mediastinal pleura is incised longitudinally. Left-sided pericardial holding sutures are pulled to the right (↓). The proximal descending aorta, where the distal anastomosis is done, can be visualized. The anastomosis is performed in the left pleural cavity without touching the LRLN (▼). (SCP: selective cerebral perfusion)



**Fig. 2.** After the completion of the distal anastomosis, the prosthetic graft is pulled into the pericardial cavity through the aortic tunnel without touching the LRLN (▼).

whether one uses a median sternotomy or a left lateral thoracotomy. When using a median sternotomy and extra-pleural approach, no matter how gently the LRLN is dissected, hoarseness may result. When performing the distal anastomosis only from inside the aorta, this method is said to protect the LRLN, it is often difficult especially if the aneurysm is minimally dilated or of the small sacular type, furthermore it is definitely impossible to see

and make sure of the safety of the LRLN during this procedure. Teixido et al.<sup>5)</sup> showed that LRLN palsy with thoracic-aortic-aneurysm type I repair rarely recovers. In the current study, 2 of 7 patients who underwent the modified surgery suffered hoarseness before surgery; the remaining 5 patients had normal LRLN function both before and after surgery. Fortunately one patient with pre-operative hoarseness recovered function of the left vocal

cord six months postoperatively. This highlights the importance of maintaining the LRLN even if a patient has hoarseness preoperatively. During the same period of this study, there were 10 candidates for this modified surgery. However, we abandoned it for 3 patients because of the following reasons; strong adhesion between the left chest wall and the left lung, ruptured aneurysm into the left pleural cavity and existence of aberrant right subclavian artery. This technique is very useful for the protection of the LRLN during surgery for distal aortic arch aneurysm when using a median sternotomy approach.

## References

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