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Intralaryngeal arytenoidectomy
A report of six cases

by

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Introduction

Bilateral abductor paralysis of the vocal cords may result in stridor, particularly on exertion or during upper respiratory tract infection. There are many causes for this condition, the most common being iatrogenic, following thyroid surgery.

The airway may be improved by tracheostomy, by lateralizing one or both vocal cords by arytenoidopexy or by arytenoidectomy.

The latter procedure was first performed in 'roarer' horses by veterinary surgeons (Von Leden, 1950); in humans it has been performed by various routes:

1. Laryngofissure approach, described by Baker (1916).
2. External approach, described by Woodman (1946).
3. Intralaryngeal or endoscopic approach, first described by Thornell (1948).

We present six cases of bilateral abductor paralysis of the vocal cords treated by intralaryngeal approach at Wythenshawe Hospital, Manchester.

Case Histories

Case No. 1

Mrs. D. B., a 56-year-old housewife, presented eight years after thyroidectomy with stridor associated with an upper respiratory tract infection.

Indirect laryngoscopy showed both vocal cords to be in the midline, with minimal abduction on the right side.

An emergency tracheostomy was performed, and two months later a left arytenoidectomy was carried out. The patient was decannulated on the third post-operative day and discharged on the sixth. The patient was last seen five years later, with an adequate airway and a reasonable voice.

Case No. 2

Mrs. A. R., a 37-year-old housewife, was admitted with a severe asthmatic attack. She had palsies of the left VIIth, Xth, XIth and XIIth cranial nerves, following poliomyelitis 17 years earlier. She developed stridor associated with a candidal throat infection five days after admission, requiring emergency tracheostomy. She was decannulated two weeks later, after the infection had resolved. The patient was readmitted four years later with inspiratory stridor associated with an upper respiratory tract infection. Indirect laryngoscopy showed a left vocal cord paralysis and limited movement of the right vocal cord. Her symptoms cleared with conservative treatment and she was discharged five days later. Over the next two years she had several similar attacks associated with upper respiratory tract infection, and so a tracheostomy and left arytenoidectomy were performed. She was decannulated on the seventh post-operative day and discharged on the tenth. The patient was last seen 16 months later, with an adequate airway and a reasonable voice.

Case No. 3

Mrs. M. D., a 52-year-old Civil Servant, presented with history of hoarseness and dyspnoea, more marked at night and on exertion, following a bout of influenza twelve years earlier.

Her symptoms had worsened over this period. Indirect laryngoscopy at onset had shown bilateral partial abductor palsies. Eight years later the left cord had become immobile and at presentation the right cord was also immobile.

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A tracheostomy and left arytenoidectomy were performed but she could not tolerate decannulation. A right arytenoidectomy was performed three weeks later. She was decannulated on the eighth post-operative day and discharged on the thirteenth.

She was last seen 29 months later, with an adequate airway but a weak voice. This lady developed granulations over the site of her first arytenoidectomy which cleared without further treatment. She was the only case to do so.

Case No. 4

Miss S. M., a 22-year-old girl, presented with a twelve-year history of intermittent attacks of stridor associated with upper respiratory tract infection, following a very severe head injury in a road traffic accident. Indirect laryngoscopy showed bilateral abductor paralysis of the vocal cords, with minimal movement of the right cord. A tracheostomy and left arytenoidectomy were performed. The patient was decannulated on the sixth post-operative day and discharged on the eleventh. She was last seen two years later, with an adequate airway and a reasonable voice.

Cse No. 5

Mrs. S. A. K., a 50-year-old housewife, was referred from Iraq for assessment. Following a thyroidectomy one year earlier, she had developed bilateral abductor paralysis with stridor, requiring emergency tracheostomy.

The patient was grossly overweight and could not tolerate a tracheostomy tube smaller than size 32 F.G. A right arytenoidectomy was performed and repeated attempts at decannulation over the next month failed. A left arytenoidectomy was then carried out. Further attempts to decannulate also failed, and she still requires a tracheostomy.

Case No. 6

Mr. P. B., a 37-year-old building site labourer, presented with dyspnoea two years after a road traffic accident in which his trachea was ruptured. Direct laryngoscopy showed bilateral abductor palsy and a bar of scar tissue on the posterior tracheal wall. this was excised, but his airway did not improve. A tracheostomy and a right arytenoidectomy were performed two months later. He was decannulated on the third post-operative day and discharged on the seventh. Owing to dyspnoea on severe exertion, he obtained a lighter job as a slaughterhouse labourer, with which he has had no problems. He was last seen sixteen months post-operatively, with an adequate airway and a reasonable voice.

TABLE I

CAUSE AND SEX DISTRIBUTION

Cause	No. of cases	F	M
Head and neck injury	2	1	1
Thyroidectomy	2	2	
Inflammatory	2	2	

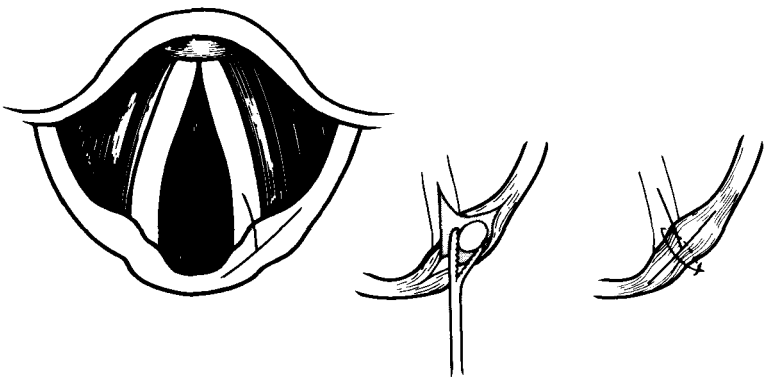


FIG. 1

Diagram showing the T-shaped modified Thornell incision, the exposure of the arytenoid cartilage and the applied suture after complete excision.

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Surgical Technique

All operations were carried out under general anaesthesia with antibiotic cover using suspension laryngoscopy. Two cases had had prior tracheostomy, the other four had a preliminary tracheostomy at the beginning of the operation. The procedure was as described by Thornell (1948) with a slight modification of the incision which was done in a 'T' shape with a No. 11 blade on a long handle (Fig. 1).

The arytenoid cartilage was exposed by sharp dissection and then grasped with laryngeal forceps; the dissection was continued using long curved scissors, and the arytenoid was separated from the cricoid cartilage. Haemostasis was achieved by



FIG. 2

X-ray picture of the larynx and upper trachea showing the 32 F.G. tracheostomy tube completely filling the small trachea.

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electro-coagulation. The wound was sutured with Dexon in the first case, but this very difficult procedure was not attempted in the other cases and proved unnecessary.

The tracheostomy tube was half corked on the first post-operative day, fully corked on the second and removed on the third, in two cases; three cases took six to eight days to be decannulated.

The patients were discharged between the sixth and thirteenth post-operative days.

Only one minor complication occurred, Case No. 3 developing granulations over the incision which resolved without further surgery.

Discussion

Arytenoidopexy gives very good early results, but the cord gradually returns to the midline. Arytenoidectomy is necessary and probably sufficient for long-term success and is the procedure of choice for bilateral abductor palsy (Biller and Lawson, 1980).

Woodman (1953) reported 521 arytenoidectomies by the external approach performed by ninety surgeons. Decannulation was possible in 88.3 per cent of all cases, and the voice was reported as adequate in 75 per cent.

Brown (1951) emphasises that:

(a) Compared with the external approach, the intralaryngeal route offers:
  (i) Simplicity.
  (ii) Reduced rates of infection and haematoma formation.
  (iii) Easier judgment of the amount of airway gained.

(b) Before advising arytenoidectomy, the size and shape of the larynx, and the sex, occupation and psychological state of the patient must be considered.

The same operative result may be successful in one case and unsuccessful in another, as a sedentary worker will not need so wide an airway as a labourer.

Case No. 6, who post-operatively could manage moderate but not heavy labouring, illustrates this point.

Similar criteria apply to the voice, which may be adequate for social but not for professional use. Clergymen, teachers and barristers may well prefer a permanent tracheostomy with use of a speaking valve.

Case No. 5 was overweight, distraught and unco-operative and she had a small trachea. Before operation she could tolerate no tube smaller than 32 F.G., the size which radiology demonstrated completely filled her trachea (Fig. 2). In retrospect it is not surprising that decannulation could not be achieved after arytenoidectomy.

Summary

Six cases of bilateral abductor palsy with stridor are presented. Following unilateral intralaryngeal arytenoidectomy, four had adequate airways and reasonable voices. Two required bilateral arytenoidectomy, one acquired an adequate airway at the expense of a weakened voice, and the other still requires a tracheostomy. There was only one minor complication. Decannulation and discharge from hospital were usually rapid.

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