

## Short communication

# Laryngeal closure at the level of the false cord for the treatment of aspiration

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### Abstract

A new procedure for aspiration which closes the larynx at the level of the false cords is reported. This method is not harmful to the vocal folds and maintains arytenoid movement, thus preserving phonatory function. With the advance of the operative technique for aspiration and swallowing rehabilitation, patients who have recovered from aspiration can be helped. Our procedure can be recommended for such cases.

**Key words:** Surgery, laryngeal; Aspiration

### Introduction

What procedure should be chosen for the management of chronic aspiration?

To prevent aspiration, several procedures have been advocated, such as laryngectomy, tracheoesophageal anastomosis (Lindeman *et al.*, 1976), an epiglottic-flap procedure (Habel and Murray, 1972) and the laryngeal-closure procedure (Mont-

gomery, 1975). Such procedures frequently sacrifice the voice of patients.

Various neurological disorders and post-operative anatomical and functional change of the laryngopharynx may cause recur-

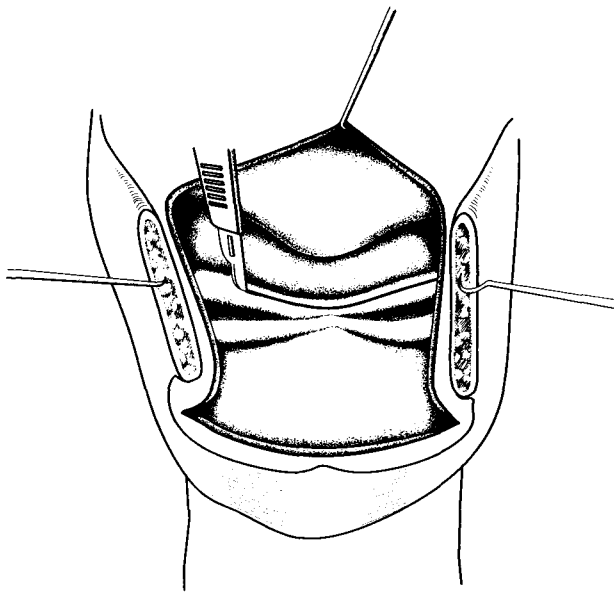


FIG. 1

An incision is made on the convexities of the false cords. This incision is continued across the posterior commissure.

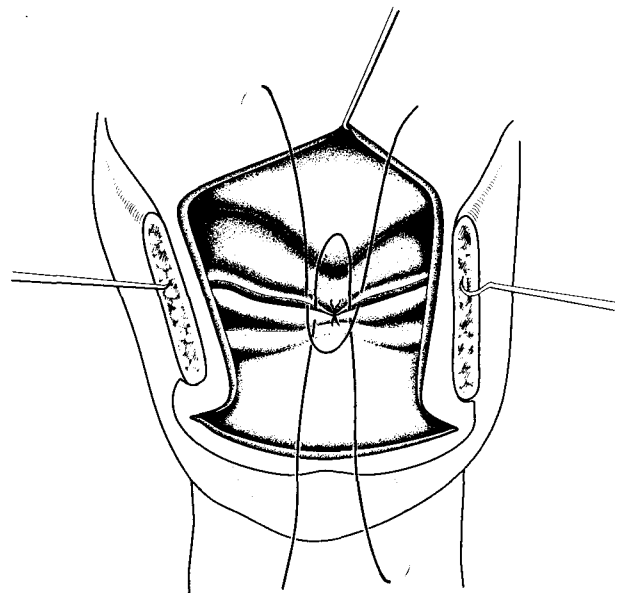


FIG. 2

A 4-0 nylon suture is passed through the inferior aspect of the false cord at the posterior commissure. The suture is then inserted into the inferior aspect of the contralateral false cord. An identical suture is passed through the superior aspect of the false cords and then both superior and inferior sutures are sewn along the incised line of the false cords.

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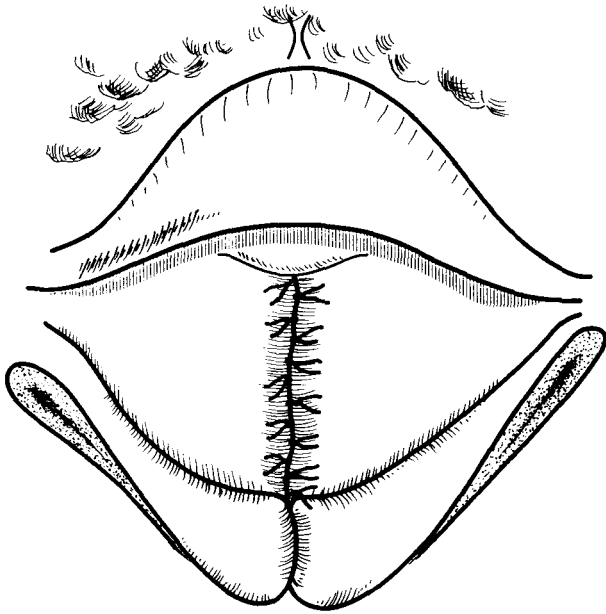


FIG. 3

The glottis after the glottic closure is complete. Fast hardening fibrin glue (Beriplast P, Behringwerke, Germany) is used along the line of the sutures. The thyroid laminae at the anterior commissure are approximated anteriorly after finishing the sutures.

rent or persistent aspiration. If the patient has a progressive disorder, these procedures are acceptable as a final resort. However if the patient has the possibility of recovery from his/her aspiration, then a different procedure may be preferable.

Such a case was reported by Lulenski (1980) and we have also experienced a similar case. Lulenski's case underwent laryngeal closure by Montgomery's method. Four months later, the patient was dramatically recovered from neurological deficits and received a reopening of the laryngeal closure by laryngofissure. He also reported that phonation after reopening was good.

Of the three methods above, Montgomery's procedure is the most convenient and suitable for the patients who have a possibility of recovery. However phonation may be compromised because the free margins of the vocal folds and arytenoid muscle may be scarred.

We propose a new procedure for aspiration which closes the larynx at the level of the false cords. This method is not harmful to the vocal folds and keeps the arytenoid muscle movements intact.

A patient, with a vascular disorder of the central nervous system, who underwent laryngeal closure by our method is reported here. After recovery and swallowing rehabilitation, his larynx was reopened by laser microlaryngosurgery. He successfully achieved good phonation without aspiration.

This paper introduces a new method of laryngeal closure and reopening which appears to have less morbidity than previously described methods.

#### Method

Anaesthesia is administered by way of tracheotomy. A laryn-

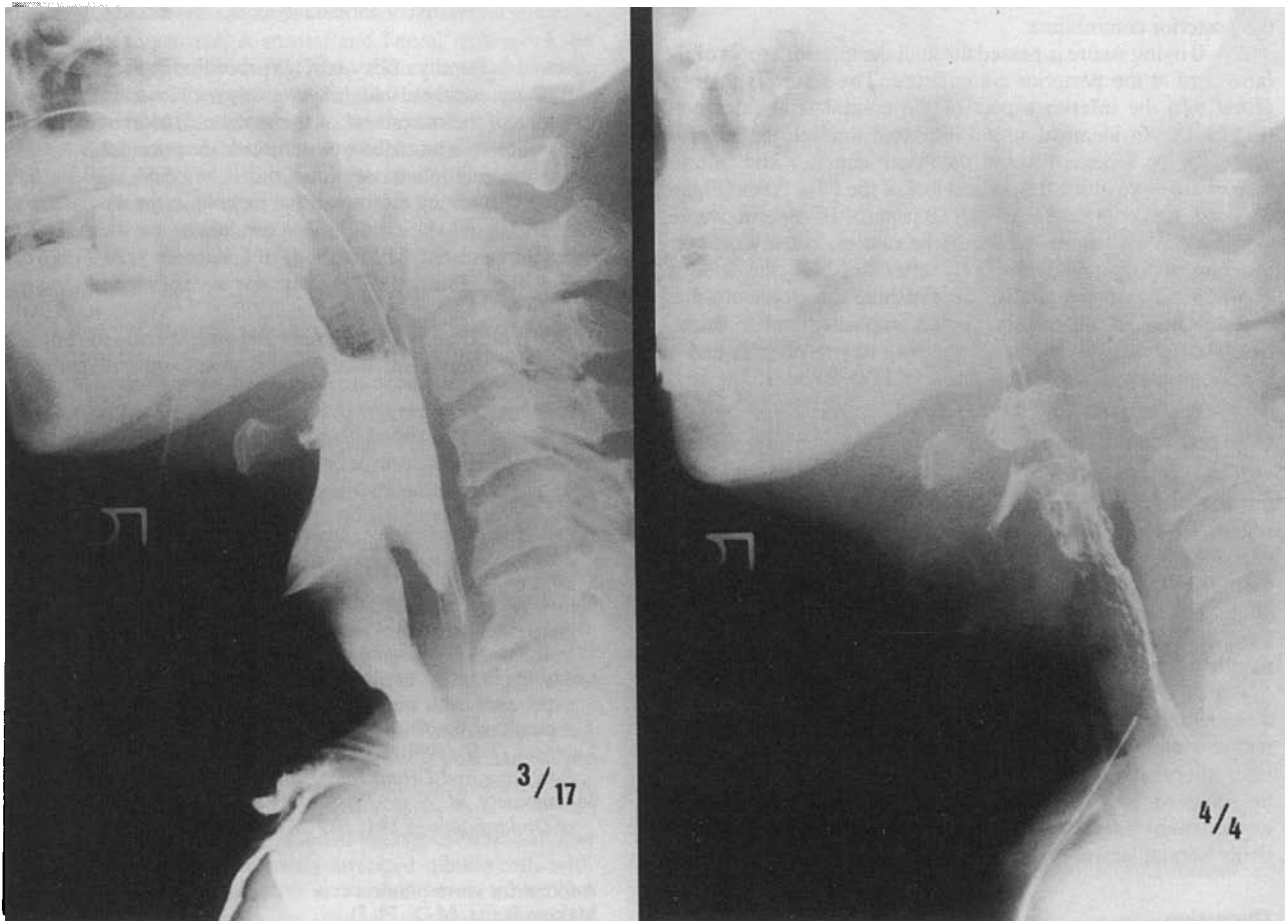


FIG. 4

Left: Fluorograph of our patient with a vascular disorder of the central nervous system exhibiting severe aspiration. Right: He underwent laryngeal closure by our method, cricopharyngomyotomy and laryngeal elevation. The fluorograph four days after surgery shows little pooling of barium in his supraglottic cavity.



FIG. 5

Fibrescopic examination of the glottis of our patient two months after surgery. Nylon sutures (4-0) are seen along the closure line.

gofissure is performed and the thyroid laminae are retracted laterally using large skin hooks. An incision is made on the convexities of the false cords (Figure 1), and continued across the posterior commissure.

A 4-0 nylon suture is passed through the inferior aspect of the false cord at the posterior commissure. The suture is then inserted into the inferior aspect of the contralateral false cord (Figure 2). An identical suture is passed through the superior aspect of the false cords and then both superior and inferior sutures are sewn along the incised line of the false cords (Figure 2). Fast hardening fibrin glue (Beriplast P, Behringwerke, Germany) is used along the line of the sutures. The thyroid laminae are approximated anteriorly after finishing the sutures. Figure 3 indicates the glottis after finishing the glottic closure.

Reopening of the sutures is accomplished under microlaryngosurgery. The sutures are cut by a laryngeal knife and or CO<sub>2</sub> or potassium titanyl phosphate (KTP/532) laser.

### Case report

A 78-year-old male patient with a vascular disorder of the central nervous system developed aspiration (Figure 4: Left). In March 1989, he underwent laryngeal closure by the method described above, cricopharyngomyotomy and laryngeal elevation. The fluorograph four days after the surgery shows little pooling of barium in his supraglottic cavity (Figure 4: Right). Figure 5 shows fibrescopic examination of his glottis two months after surgery.

With the advance of swallowing rehabilitation, he showed almost normal swallowing function on fluorographic and manometric examination. He underwent reopening of his glottis by laser microlaryngosurgery in August 1989. Following surgery he achieved good phonation without aspiration. Fibrescopic examination one year after the reopening surgery revealed a relatively normal larynx (Figure 6).

### Discussion

Many reported methods for glottic closure (Habel and Murray, 1972; Lindeman *et al.*, 1976) (except Montgomery, 1975) are not reversible for phonatory function.

Our procedure of glottic closure is a reversible method with

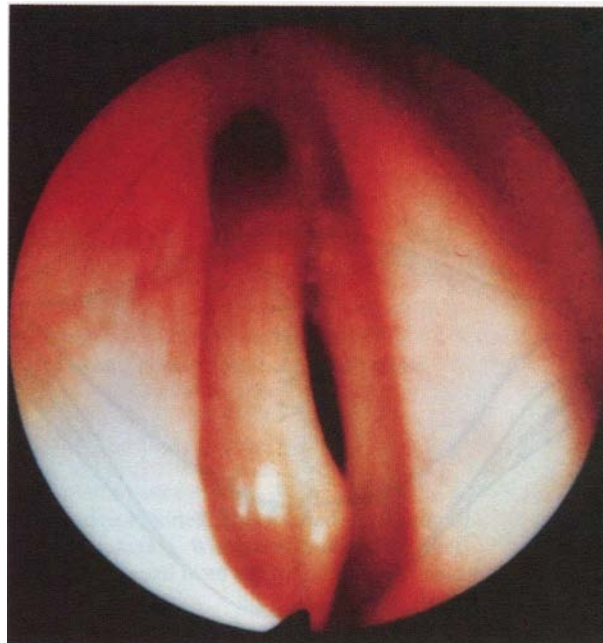


FIG. 6

With the advance of swallowing rehabilitation, our patient showed almost normal swallowing function on fluorographic and manometric examinations and then he received the re-opening of his glottis by laser microlaryngosurgery. Following surgery he had reached a good phonation without aspiration. Fibrescopic examination one year after the reopening surgery revealed a relatively normal larynx as shown here.

minimal deformity of larynx. This procedure incises the superior part of arytenoid muscle, however this incision causes little disturbance of the movement of the arytenoid. Moreover, our procedure does not harm the free margin of the vocal folds, so it also maintains good phonatory function.

With the advance of operative technique for dysphagia and swallowing rehabilitation, more candidates for closure procedures may present. The methods of Lindeman *et al.* (1976) and Habel and Murray (1972) may not be appropriate for such patients.

Our procedure is a convenient and simple method for glottic closure. It offers a satisfactory alternative to present methods of aspiration control.

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