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How I do

Percutaneous suture lateralization for bilateral vocal fold paralysis - How we do

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Abstract

Bilateral abductor cord paralysis is rare. But it requires urgent surgical intervention due to upper airway obstruction at glottis level. Percutaneous suture lateralization seems to be a safe and effective treatment, which enable patients to be devoid of tracheostomy without significant influence on phonation or swallowing function. Here we explain the technique of suture lateralization of vocal cord with the available resources.

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Introduction

Bilateral abductor cord paralysis is an uncommon clinical scenario. It can prompt severe and poorly tolerated inspiratory dyspnea due to upper airway obstruction at glottis level and demanding urgent intubation or tracheostomy. Bilateral nerve damage following total thyroidectomy is the main cause of bilateral abductor vocal fold paralysis is, but it can also be due to neurodegenerative, neoplastic, traumatic (post-intubation), or idiopathic causes. Symptomatic bilateral abductor vocal fold paralysis need to be treated as soon as possible[1]. The primary goal of treatment is to establish a patent airway for ventilation, along with maintaining the safe swallowing and acceptable voice[2].

There are various surgical techniques are available for enlargement of laryngeal airway to patients with bilateral vocal fold immobility. Within those, reconstructive procedures would be the treatments of choice. If the recovery of nerve function is no longer to be expected only the destructive procedures could be chosen. According to Lichtenberger, endo-extra laryngeal suture laterofixation of the vocal fold is one of the reversible minimally invasive method and it avoids the need of tracheotomy.[3] This technique aids to expand the glottic opening and permanently improves respiratory function by lateralization of one vocal fold with preserved laryngeal architecture.[1] We are using 18-gauge cannula needle instead of Lichtenberger's needle for this endo-extra laryngeal suture laterofixation of the vocal fold because, it is not available in our hospital.

Procedure

Patient selection

1. Patients with bilateral abductor cord paralysis, who are diagnosed with awake flexible laryngoscopy, with clinical correlation of associated respiratory distress

2. Patients with bilateral abductor cord paralysis and on tracheostomy

Procedure

Procedure is performed under general anesthesia with either endotracheal intubation or tracheostomy ventilation. If endotracheal tube intubation is needed, ET tube will be selected 0.5 or 1.0 size smaller than the correct size of ET tube to that patient, to increase the surgical field.

Lateralization will be performed on the mostly affected vocal cord. Patient is positioned supine with extended neck (with the help of small sand bag).

Anterior part of the neck is cleaned with povidone iodine from margin of the mandible to clavicular region. Patient is draped exposing surgical area and mouth with sterile towels.

Level of the vertical midpoint of the thyroid cartilage, posterior border of the thyroid cartilage and midpoint between vertical midpoint and posterior border of the thyroid cartilage will be marked with methylene blue.

The entire glottis is exposed with the help of an operation laryngoscope.

A 3-0 polypropylene suture (suture 1) (Fig 1) will be loaded into an 18-gauge cannula needle. Usually, the needle is then advanced with suture through the external cervical skin from the lateralized side, at the level of midpoint between vertical midpoint and posterior border of the thyroid cartilage, to enter the airway superior to the vocal cord. Once needle tip is visualized into the glottis, suture 1 will be advanced the through the needle and take the one tip out through larynx through operating laryngoscope. Then the needle will be withdrawn and taken out from skin. If the patient is a child, the needle can be introduced from non-lateralize side to lateralized side. Load the suture 1 into the needle and once visualized, the suture is fed through while withdrawing the needle, thus taking out the tip of the suture 1 through larynx and oral cavity as mentioned earlier.

A 4-0 polypropylene suture loop (suture 2) (Fig 2) will be loaded into an 18-gauge cannula needle. The needle with suture 2 is to be introduced through skin, 0.5mm below the previous position and entered the airway through thyroid cartilage, but inferior to the vocal cord. Then suture 2 will be advanced the through the needle. Once the loop is visualized within the larynx, one end of suture 1, which was already taken out through larynx is inserted into the loop of suture2. Now the loop suture 2 is pulled back into the needle, which will bring suture 1 along with it into the needle. Then the needle is withdrawn and taken out from the skin. With this technique the tip of suture 1 which was initially within the larynx will be out along with suture 2. This ensures suture 1 is looped over the vocal cord and both suture tips are out. The vocal cord is now lateralized by pulling the suture1.

A skin incision of approximately 1 cm will be made between the tips of the suture1 (Fig 3), the suture will be knotted over the silastic button subcutaneously and the skin incision is closed.

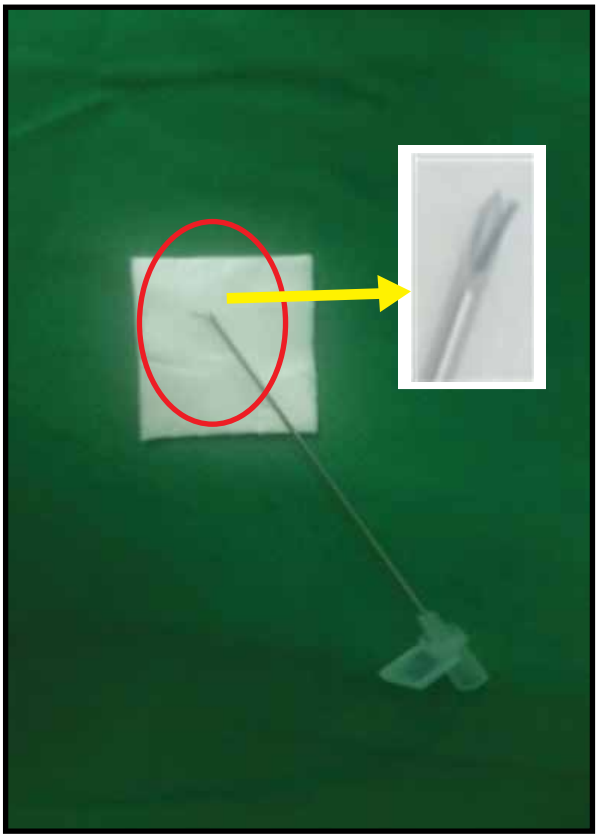

Figure 1: Loading of thread 1

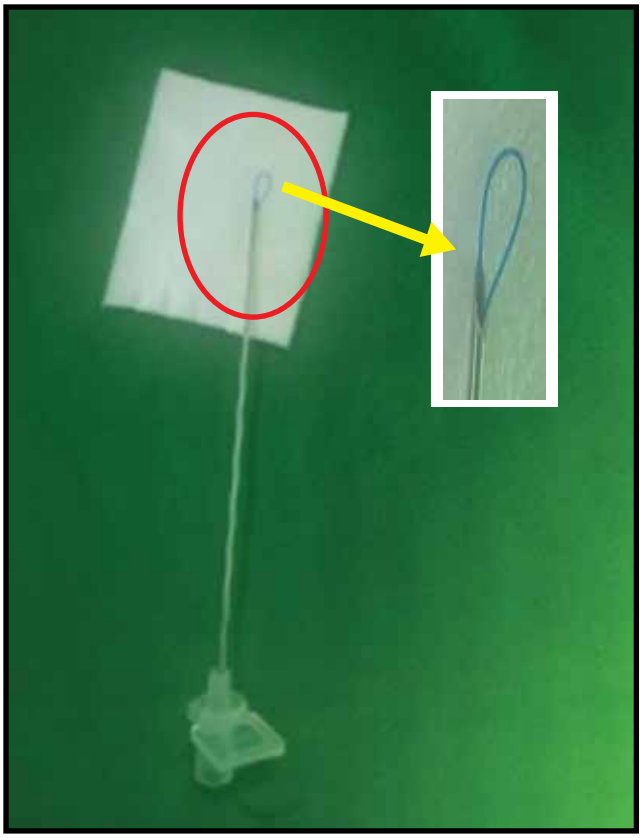

Figure 2:Loop of thread 2

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3: Skin incision burying the knot

Conclusion

The above mentioned suture lateralization of vocal cord in Bilateral vocal cord palsy is a feasible option in an environment lacking sofisticated instruments . The main advantages of this technique are that it preseves the laryngeal architecture, avoids a tracheostomy and the acompanying social stigma, it is reversible once vocal cord movement is restored and can be performed either with microscope or endoscope. If the glottis airway is still inadequate another suture can be placed in the same side of the vocal cord. Then disadvantage of this procedure is if patient has limited neck extension such as severe cervical spondylosis or cervical spine disc prolapse, procedure needs to be done by well experienced person.

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