TECHNICAL NOTE

Tongue-lip adhesion

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Introduction

Tongue-lip adhesion is a surgical invention that removes respiratory obstruction in glossoptosis of whatever etiology, whether or not part of the Pierre Robin triad. The principle consists in protracting the tongue forward and suturing the tip to the lower lip. The protraction reduces the verticalization of the tongue base and contact with the posterior pharyngeal wall, which cause supraglottic airway obstruction. Although several refinements have been introduced since Beverly Douglas’s first description [1], the basic concept remains unchanged [2].

Indications

Tongue-lip adhesion treats only the pharyngeal obstruction associated with glossoptosis. It is recommended in case of severe respiratory obstruction, either as primary treatment or in case of failure or difficulty in terminating another technique such as non-invasive ventilation or nasopharyngeal intubation. Before adopting the indication, it is therefore essential to examine the entire respiratory chain, notably to rule out any associated laryngotracheal lesion liable to cause treatment to fail or requiring associated surgery. This assessment generally uses laryngotracheal flexible endoscopy and also sheds light on possible intubation issues.

Pre-operative polysomnography is the ideal means of objectifying and quantifying the obstruction and its impact; it also estimates the benefit to be expected on postoperative assessment. However, it is not feasible if respiratory distress requires assisted ventilation.

Tongue-lip adhesion is contra-indicated in case of central disorder with risk of chronic inhalation or of laryngotracheal deformity for which associated surgery is not possible. The literature does not report any risk factors for failure that might guide indications. Associated deformity or syndromic forms do not seem to correlate with higher failure rates [3,4].

Intubation

Surgery is performed under general anesthesia. Intubation can be difficult, especially in case of associated mandibular retrusion, with sometimes a very “anterior” glottis, and such difficulties must be anticipated. This requires adapting

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the material and technique, by using either videolaryngoscopy or awake intubation by flexible endoscope.

Installation

Once intubated, the child is positioned in dorsal decubitus. The facial region is raised by a block under the shoulders, with a head cushion maintaining cervical hyperextension.

Flaps

Surgery begins by making raw areas of about 1 × 1.5 cm on the ventral side of the tongue and posterior side of the lower lip. The mucosa and submucosa are resected, with dissection to the muscular plane. The position of these raw areas is calculated so that the tip of the tongue touches the anterior intra-oral limit of the lower lip (Figs. 1A and 2). Some authors recommend conserving the mucosal flaps by suturing them together [5]. Our experience is that this provides no particular benefit, and that it is simpler to resect them.

Pexy

Before proceeding to pexy, it should be checked that the tongue protraction is sufficient for suturing without tension. In some cases of ankyloglossia, it may be necessary to section the frenum of the tongue. In the most severe cases, genioglossus muscle sectioning [6] or anterior floor release may facilitate mobilization of the tongue. Floor release can also be achieved by a 5 mm incision under the mandibular symphysis. Subperiosteal release of the muscle insertion will in that case be easier on an intra-oral approach in case of severe mandibular retrusion.

Adhesion is achieved by two transverse stitches using fairly large caliber suture (Vicryl 00) to avoid sectioning muscle fibers. The sutures should be deep, down to the submucosa in the lip, to ensure adequate traction resistance. The tongue sutures should not be too lateral, to avoid ischemia-inducing lesion to the distal extremities of XII and the lingual pedicle, which would delay healing and risk suture failure (Fig. 3).

Contention suture

To reduce traction on the adhesion during the healing phase, a contention suture is performed between chin and tongue,
running backward through a button or silicone tube to prevent the suture passing through the mucosa or lingual muscles. Forward, the suture is fixed on a tulle-gras dressing to prevent local trophic problems (Fig. 1B). If tension is too great, a second contention suture can distribute the force more widely over the tongue, preventing early detachment.

Some authors recommend fixation under the chin [6] to reduce scarring sequelae; this variant, however, fixes the tongue without ensuring direct contention of the adhesion.

Postoperative course and management

Extubation timing is decided on a case-by-case basis. It can be at end of surgery; other teams maintain intubation for 24 to 48 hours, which has the advantage of reducing the risk of respiratory distress due to lingual edema, which could be problematic in this context of oral surgery and difficult intubation. Delayed extubation also allows effective sedation in case of severe pain syndrome.

Postoperative management is mainly based on analgesia of at least step II. Short corticotherapy is prescribed in case of severe lingual edema. The compress should be greased daily.

To reduce traction on the adhesion, liable to cause detachment and pain, our attitude is to wait 7 to 10 days before reintroducing oral feeding and allowing non-nutritive suction; meanwhile, feeding is via a nasogastric tube. The contention suture is removed on day 10. Skin care is required until the skin openings heal. Discharge home is organized once nutritional and respiratory independence has been achieved.

Adhesion release is timed according to morphologic, neurologic and respiratory evolution, and is usually by simple section, which may be performed during palate closure in Pierre Robin syndrome if respiratory and morphologic status is satisfactory. If mucosal flaps have been conserved, they are repositioned after dissection; if they were resected, the adhesion areas are left raw.

Results — complications

Tongue-lip adhesion is a relatively effective technique, removing respiratory obstruction in 75% to 84% of grade-3 Pierre Robin syndrome cases [3–5,7]. Results should be assessed on control polysomnography, which should not be performed too early so as to avoid artifacts due to postoperative congestion (reduced suction, congestion aggravated by intubation, etc.) and to residual malnutrition or sedation.

Polysomnography should, on the other hand, be early enough to detect failure and allow timely and effective management of the respiratory obstruction. Failure requires alternative treatment: non-invasive ventilation, mandibular distraction in case of severe associated mandibular retrusion, or tracheotomy.

Postoperative respiratory improvement is accompanied by improved feeding in almost 50% of cases [4,5,7], although this may not be enough to attain independence; residual difficulties usually require maintaining multidisciplinary management.

Tongue-lip adhesion is not only simpler but also less invasive than tracheotomy. Discharge home is usually quite quick, at a mean 17 [8] to 27 days [6], requiring no special equipment or training, unlike non-invasive ventilation or tracheotomy.

Complications are rare and generally mild. Spontaneous detachment was reported in 17% to 27% of cases [4–7]. When early, this requires surgical revision; when late, surgical revision is reserved for cases in which respiratory assessment shows recurrence of respiratory obstruction. Technically, the transmuscular nature of the adhesion sutures reduces the risk of detachment, compared to isolated mucosal flap suture [6]. Cutaneous superinfection of contention suture orifices was reported in 13% to 27% of cases [5,8], requiring only local care. The esthetic sequelae of the chin orifices are slight compared to those of tracheotomy or the centrofacial growth disorder induced by long-term non-invasive ventilation. The location of the mucosal flaps leaves no visible sequela. Rare cases of lingual mucocele were reported [8]. In one case, accidental inhalation of the button, complicated by tracheoesophageal fistula led to death [9]. Postoperative mortality [2,5], however, is exceptional: reported cases were due to decompensation of associated cardiac or laryngotracheal pathologies rather than to the operation as such. Finally, Leblanc and Golding-Kushner, using a different technique fixing the tongue to the mandible [10], reported temporarily impaired elocution. Ankyloglosia by bone structure fixation is avoided by the present technique.

Conclusion

Tongue-lip adhesion is a simple technique. It is quick, relatively non-invasive and effective, treating the respiratory obstruction associated with glossoptosis of whatever etiology. Respiratory improvement is rapid and stable. Discharge home is early and requires no special equipment or parental training, compared to other treatments of the consequences of glossoptosis.

Disclosure of interest

The authors declare that they have no conflicts of interest concerning this article.

References


