

The tensor stitch for soft palate closure revisited

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ABSTRACT

The tensor veli palatini muscle is involved in opening of the Eustachian tube during chewing and swallowing, allowing for equilibration of pressure between the middle ear and external environment. In patients with cleft palate, abnormal musculature in the region of the cleft results in Eustachian tube dysfunction. A palatoplasty with muscle repositioning is advocated to reduce the incidence of otitis media, which is a result of this. A special suture is described which can be incorporated into a palatoplasty procedure to further reduce the incidence of otitis media. This suture is inserted around the tendon of the tensor veli palatini muscle bilaterally, and when activated under tension in the midline, it results in opening of the Eustachian tube with improved middle ear ventilation. This novel suture results in a reduction in the incidence of otitis media due to improved middle ear ventilation and reduces tension across the suture margins.

Keywords: Cleft palate, Eustachian tube dysfunction, otitis media, soft palate repair

The tensor veli palatini muscle normally inserts on the cartilaginous part of the Eustachian tube and slings around the hook of the hamulus, to attach as an aponeurosis in the midline at the anterior aspect of the soft palate. The Eustachian tube is pulled open with contraction of the muscle during chewing and swallowing, and this allows for equilibration of pressure between the middle ear and the outside environment.

An association between soft palate clefts and otitis media has been well- documented in the literature. The most plausible explanation is related to a chronic Eustachian tube dysfunction as a result of abnormal musculature in the region of the cleft palate.^[1] Anatomical dissections reveal an abnormality of the tensor veli palatini muscle in cleft patients, and this attributes to abnormal functioning of the muscle.^[2]

A palatoplasty has been demonstrated to have a positive effect on preventing otitis media.^[3] The most common of these procedures used to manage patients with cleft soft palate is an intravelar veloplasty and entails anatomically repositioning of

the muscles of the soft palate during closure of the congenital defect.^[2]

A modification of the intravelar veloplasty according to Bütow *et al.* involves an inclusion of an additional suture into the technique. This suture is inserted around the tendon of the tensor veli palatini muscle medial to the hamulus bilaterally. When activated by tension in the midline, the stitch medialises the tendon of the tensor veli palatini muscle and issues traction on the Eustachian tube. This results in the Eustachian tube opening with an increased diameter and better middle ear drainage.^[4] A

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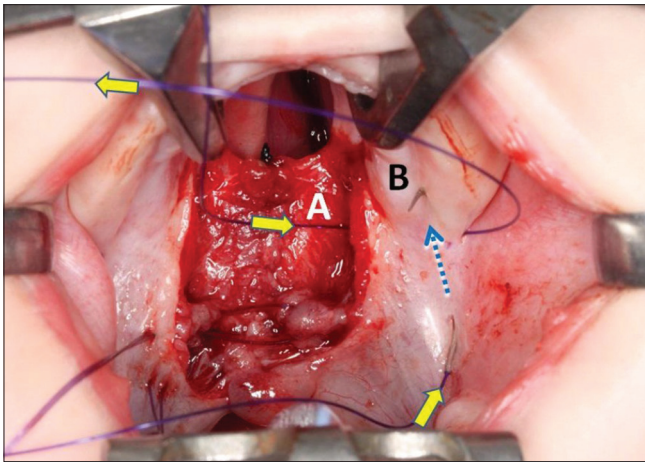


Figure 1: Placement of the tensor stitch

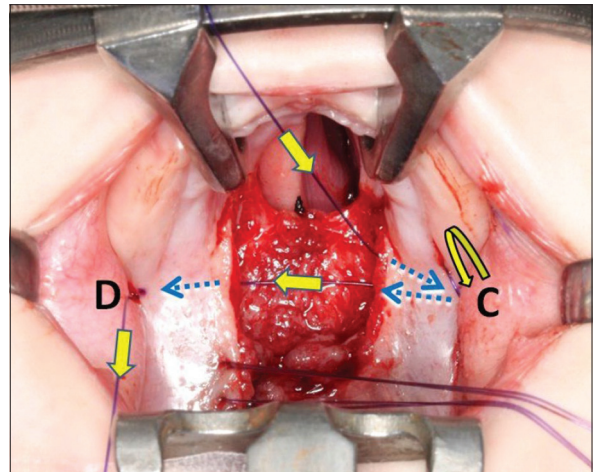


Figure 2: Placement of the stitch to the contralateral side

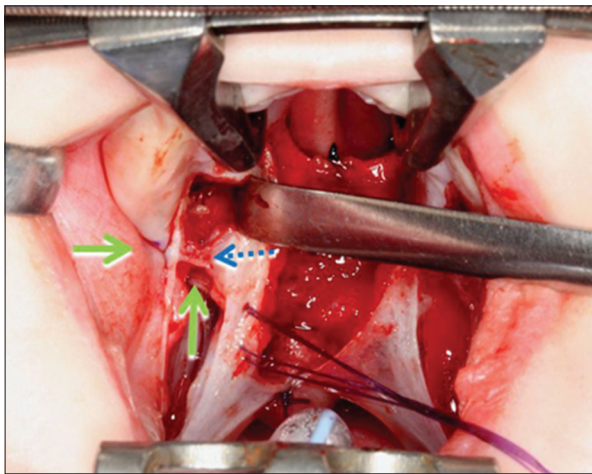


Figure 3: Arrow indicates the tendon of Tensor veli palatini muscle

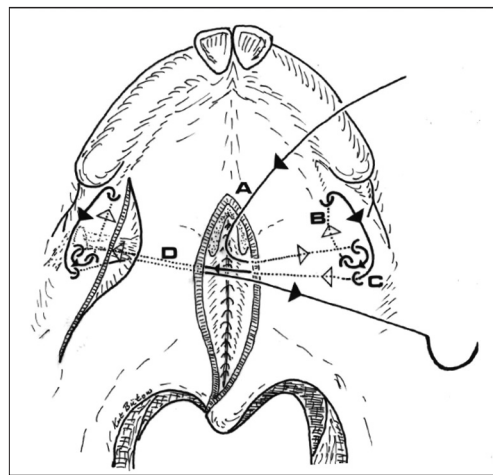


Figure 4: Diagrammatic representation of tensor stitch placement

reduction in the incidence of otitis media ranging between 30% and 50% was noticed as a result of the tensor suture.^[5]

This reduced incidence translates to a lesser need for myringotomies and reduced complications associated with the procedure.^[1]

There are benefits to incorporating a tensor stitch, which is a relatively noninvasive procedure, into the soft palate repair. Apart from improving middle ear ventilation, this procedure reduces tension at the suture margins. There has been no complication associated with the placement of this innovative suture.

The tensor suture is placed after suturing of the nasal mucosa and palatoglossus/palatopharyngeus muscle bundle prior to the closure of the levator veli palatini muscle and oral layers. A Polydioxanone 3.0 (Ethicon, Sommerville, New Jersey) is utilized for its high tensile strength coupled with its delayed resorption pattern.

The surgical procedure (See Figure 1-4, and video link):

- A The needle is entered through the midline cleft defect, between the nasal and muscle layer, and exits \pm 5 mm posterior to the tuberosity through the oral mucosa
- B It is re-inserted through the mucosa at a position posterior to where it exited. The needle is directed towards the tuberosity, medially to the hamulus and rotated against the pterygoid fossa

- C The needle then enters the oral mucosa at a point lateral to the point A and B and is directed toward the midline defect
- D The similar process is carried out on the contralateral side. The knot is then tied in the midline while the suture is held under maximum traction.

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Conflicts of interest

There are no conflicts of interest.

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