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Case Report

Incidental Finding of Dehiscent Facial Canal over Tympanic Annulus

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ABSTRACT

One of the most fearful complications of middle ear surgery is injury to facial nerve. Facial canal dehiscence leads to an increased risk of facial nerve damage even in routine middle ear procedures. We are reporting a very rare presentation of dehiscent vertical segment of facial canal found during myringoplasty which must be kept in mind while lifting the fibrocartilaginous tympanic annulus.

Key Words: Facial canal dehiscence, Tympanic annulus

INTRODUCTION

The relevance of the knowledge of anatomic variations of facial nerve in middle ear, especially for an otology surgeon, cannot be overemphasized. One of the most fearful complications of middle ear surgery is injury to facial nerve. Facial canal dehiscence leads to an increased risk of facial nerve damage even in routine middle ear procedures. The main cause of the facial canal dehiscence is variation of the normal developmental process and other causes include longstanding inflammation, the result of prior ear surgery or trauma, and the pressure effect of tumor or cholesteatoma. [1-3] Our aim is to discuss an incidental finding of dehiscent facial canal over tympanic annulus during a routine myringoplasty procedure and role of intraoperative rigid endoscopic examination of middle ear during the procedure.

A 28yrs old female patient with a diagnosis of right inactive mucosal chronic otitis media having a central perforation was prepared for myringoplasty under local anesthesia at our centre. The pure tone air threshold in right and left ear was 30dB and 10dB, respectively.

After taking informed consent patient was taken for surgery. A postauricular incision was given and temporalis fascia graft was harvested. While lifting the tympanomeatal flap under microscope, we noticed a thick cord like structure lying just medial to the posterior fibrocartilaginous annulus. Chorda tympani nerve was not seen initially. We introduced a 0 degree rigid endoscope in order to better appreciate that thick cord like structure which we identified as a dehiscence over the vertical segment of facial nerve lying anterior to the posterior segment of the tympanic sulcus at 9'o clock position. A thin nerve root was also seen originating from superior surface of facial nerve, travelling towards incus. It was identified as chorda tympani. We placed the graft by underlay technique with care to preserve this cord like structure. Facial nerve function was normal in postoperative period.

DISCUSSION

On thorough review of available English literature, we found only one similar type of case reported by Hande Senem Deveci et al in 2017. They found that full length of mastoid segment of facial nerve was exposed in left ear of a myringoplasty patient and it was mimicking the fibrocartilaginous annulus of tympanic membrane. [4]

There is limited literature on relationship of tympanic annulus and facial canal. In a study by Adad et al on 37 normal temporal bones in 1999, it was found that the facial nerve is most vulnerable to injury in posteroinferior quadrant in transcanal surgery and annulus should not be considered as a reliable landmark for facial nerve. [5] The relationship between the vertical portion of the facial nerve and the tympanic annulus was identified using computed tomographic (CT) scans of healthy adult and pediatric patients in a study by Zaid Ali Zaghal et al in 2014. It was found that the vertical portion of the facial nerve, as it proceeds distally, takes a more anterior and lateral course, and crosses the plane of the annulus almost consistently in the inferior third. [6]

The dehiscence of vertical segment of facial canal is uncommon. In a study by Edwin H. Moreano et al 1994, facial canal dehiscence was most common at oval window (73.5%), followed by facial nerve genu area (12%), tensor tympani tendon (11.6%), other sites in horizontal segment (1.4%) and vertical segment accounted for only 1.6% of facial canal dehiscence. [7]

Di Martino et al in 2004 investigated fallopian canal dehiscences in order to assess the risk of encountering an unprotected facial nerve during routine ear surgery. They compared the appearance of the facial nerve canal in 357 routine ear operations with 300 temporal bone specimen. They detected facial canal dehiscence in 6.4% and 29.3% of intraoperative and autopsy examinations, respectively. Dehiscence just above oval window niche was most common. They did not find any dehiscence at the mastoid segment. [8]

Chang Woo Kim et al in 2008 observed dehiscence of the facial canal in 13 (8.6%) of 152 patients of chronic otitis media without cholesteatoma. There was one case each of facial canal dehiscence in the geniculate ganglion and the mastoid segment, respectively. [9]

In contrast to microscope, endoscopes can be used to visualize around the corners and helps preserving important structures. Otoendoscopy provides an improved visualization of dehiscent facial nerve as reported by James G. Naples in 2016. [10]

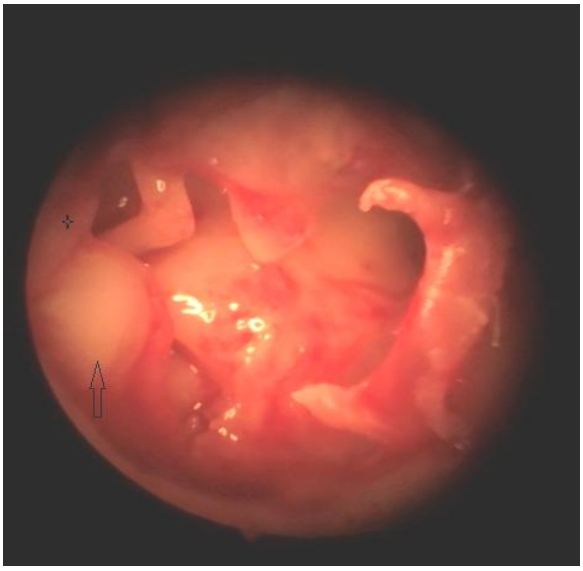

Figure 1: Intra-operative endoscopic image showing dehiscent mastoid segment of the facial nerve lying over tympanic annulus (black arrow) and the chorda tympani (black asterisk).

CONCLUSION

This very rare presentation of dehiscent vertical segment of facial canal found during myringoplasty must be kept in mind while lifting the fibrocartilaginous tympanic annulus. Such anomalies can be defined better anatomically, with use of an endoscope and thus preventing any damage to facial nerve during routine otologic surgeries.

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