Tuboplasty and eustachian dysfunction

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The precise pathophysiology features of Eustachian tube dysfunction and subsequent development of otitis media remain unknown. It has been postulated in the past that the principle site of Eustachian tube failure is the bony isthmus where the lumen has its narrowest cross-sectional diameter. (Rosenfeld and bluestone 1999).Many surgeons have proposed operations to enlarge the bony isthmus in an attempt to alleviate Eustachian tube dysfunction, but none of these procedures has demonstrated success once the tubal stents were removed. (Wellstein 1960, House et al 1969, Misurya 1975 and Jansen 1985).Misurya VK 1975 recommended that surgical procedure illustrating the possibility of reaching the Eustachian tube by way of a combined transcanal and preauricular approach.Misurya VK and Shrivastava PK 1976, described a newly devised surgical procedure for management of physiologic stenosis of the Eustachian tube occurring in 20 % of all cases of tubal occlusion, this procedure suggested tensor palati tendon strengthening.The study of Dennis et al 2001 showed that the Eustachian tube dysfunction is a final common pathway for several different types of pathologic changes in the tubal lumen. Dennis concluded that the Eustachian tube dysfunction appears to have several possible aetiologic factors including the following:-1) Primary mucosal disease: inflammatory, infection and allergy.2) Reflux from the nasopharynx and possibly laryngopharyngeal reflux.3) Primary muscular disorders: weakness and uncoordination.4) Anatomical obstruction.The use of slow motion video-endoscopy to analyse Eustachian tube dysfunction detected pathological observations occur within the actively moving cartilaginous portion of the E.T particularly the region where the anterior and posterior mucosal walls are opposed in the resting closed position and must be actively dilated to open (5mm long segment of the cartilaginous tube that lies just proximal to the bony-cartilaginous junction as the valve.).(Dennis et al 2001)In our study we have adopted the idea that surgical reduction of tissue volume within the Eustachian tube orifice and proximal lumen facilitates Eustachian tube dilation and improves Eustachian tube function.A surgical technique has been devised for removal of luminal mucosa, submucosa and soft tissue of the posterior wall down to the medial cartilaginous lamina.In our study we selected the cases with Eustachian tube orifice dysfunction after complete history and ENT examination and audiological assessment.Cases in this study were divided into 2 groups according to operative procedures:-Group A: - included 11 patients with tuboplasty and temporary myringotomy in one ear.Group B: - included 11 patients with tuboplasty and Eustachian tube stenting in one ear.No separate control group was included in the study because this was a pilot study

designed to study the safety and possible efficacy of this new procedure, outcome measures were presence or absence of middle ear effusion and impedance tympanometry.The idea of stenting the Eustachian tube with polyethylene tube was based on the study conducted by Parkin et al 1983, this study was to evaluate various tube stenting materials in an attempt to develop a successful transtympanic Eustachian tuboplasty technique. Results of this study were inadequate middle ear -ventilation in 60% of controls, 30% of silastic-stented ears, 60% of polyurethane stented ears, and 0% of polyethylene- stented ears.There were 6 cases with bilateral Eustachian tube dysfunction in group A, while 8 cases in group B. bilateral cases of both groups were subjected to myringotomy and ventilation tube insertion in the less affected ear.Tympanometry 3 months postoperatively for group A showed marked improvement in all cases after regular follow up and regular removal of crustations at the nasopharyngeal orifice of the Eustachian tube, while after 6 months 5 cases out of 11 showed marked improvement with success rate 45.5% and 6 cases presented with secretory otitis media with failure rate 54.5%. The failed 6 cases of group (A) showed marked adhesions at the nasopharyngeal orifice of ET, these cases were managed by myringotomy and ventilation tube insertion.The previous results differ from the results of Dennis et al 2003, who reported success rate of 60%.The difference may be due to difference in surgical tools as they used laser which causes vaporization of tissues with less incidence of tissue trauma and postoperative adhesions.In group B after 3months, there were 2 cases out of 11 with tympanometry type B and still type B after 6 months. In these 2 cases the tubes were spontaneously extruded during the 1st month, these 2 cases were subjected to myringotomy and ventilation tube insertion.There are another 2 cases of group B showed no improvement of tympanometry after 3 months when adhesion and crustations were removed one of the 2 cases showed type A tympanometry at 6 months follow up. The failed case was managed by myringotomy and ventilation tube insertion.The remainder 7 cases of group B showed normal tympanometry after 3 and 6 months postoperatively.In these cases the tube was removed at 3 months follow up visits. Success rate in group B was 63.6%.The previous results coincides with the results of Dennis et al 2003, who reported success rate of 60% in their study.Success rate in group A was 45.5% (5 cases out of 11) while in group B it was 63.6% (7cases out of 11).There is a difference between the results of 2 groups with best results with group B in which we performed stenting of the Eustachian tube.Best results were obtained in group B when the stent was removed after 3 months.Statistically there was no significant difference between middle ear pressures of improved cases of the 2 groups; this may be due to the small number of cases in this study.We recommend tuboplasty with stenting of the Eustachian tube for 3 months or more for cases of Eustachian tube dysfunction with further study on more cases to detect the difference between the 2 techniques.With more experience, it is hoped that the procedure may also prove useful in patients with other forms of chronic ear diseases that are possibly the result of Eustachian tube disease, such as certain types of recurrent cholesteatoma, recurrent pars tensa retraction, tympanic membrane atelectasis or perforation.