Original Research Paper

Volume-9 | Issue-3 | March-2019 | PRINT ISSN - 2249-555X

ENT

# A STUDY ON ENDOSCOPIC FINDINGS OF PHARYNGEAL END OF EUSTACHIAN TUBE ORIFICE IN PATIENTS WITH NORMAL EAR AND MIDDLE EAR PATHOLOGIES.

**Dr.Alaguvadivel** MS., DLO., Faculy Ent Dept, Kap Viswanatham Govt MED College, Trichy

**Dr. A. Satheesh Kumar*** MS., DLO., Faculy Ent Dept, Kap Viswanatham Govt MED College, Trichy
*Corresponding Author

**ABSTRACT**

**AIM :** To study and compare the established patterns of pharyngeal end of Eustachian tube orifice through 30o nasal endoscopy in i) Normal ear and ii) Ear with middle ear pathologies i.e., Secretory otitis media, Adhesive otitis media, Chronic suppurative otitis media.

**METHODOLOGY:** The materials for the present study of Eustachian tube dysfunction in middle ear pathologies and normal ear for op procedure in Government MGMGH trichy during the period September 2017 to August 2018 are as follows,

**a) Middle ear pathologies : (50 cases)**

1. Chronic suppurative otitis media
2. Adhesive otitis media and
3. Secretory otitis media scan

**b) Normal ear: (10 cases)** After complete ear, nose, mouth examination. Study was conducted.

**RESULTS (CONCLUSION):**

The study conducted definitely proves correlation between Eustachian tube dysfunction and middle ear pathologies like secretory otitis media, adhesive otitis media and chronic suppurative otitis media.

- Of these CSOM is the commonest
- Eustachian tube dysfunction is mainly due to compromised tubal dilatation
- With availability of nasal endoscope Eustachian tube function can be assessed as OP procedure, which will be helpful pre operative assessment of middle ear surgery outcome
- This study more or less with study of Dennis Spoe MDFACS except for that Compromised Tubal dilation is common than Tubal edema.
- Infuture minimally invasive intra luminal Eustachian tube surgery may be helpful in improving outcome of middle ear surgeries, particularly for graft take up.
- These are infact early days for this study of Eustachian tube dysfunction which need further modification and development. So innovative surgery may emerge ultimately, so middle ear pathologies can be better dealt with.

**KEYWORDS :**

## INTRODUCTION:

Eustachian tube is a dynamic conduit between middle ear and nasopharynx with secretory, cilliary and dilatory functions.

Eustachian tube serves to regulate air pressure in middle ear and mastoid air cell system, clears material from middle ear and prevents reflux of material or sound from nasopharynx.

Endoscopy of Human Eustachian tube has significantly increased our understanding of structural variation and functional process in normal and pathological tubes.

Chronic Eustachian tube dysfunction is a difficult problem to treat and can be very frustrating for both patient and physician.

The pathophysiology of this topic is possible by high resolution video endoscopy and revolutionary treatment are also being explored with reasonable success.

So the present study has been undertaken to evaluate pharyngeal end of Eustachian tube in normal and middle ear diseases.

## AIMS

To study and compare the established patterns of pharyngeal end of Eustachian tube orifice through 30o nasal endoscopy in

i) Normal ear and
ii) Ear with middle ear pathologies

i.e., Secretory otitis media
Adhesive otitis media
Chronic suppurative otitis media.

## REVIEW OF LITERATURE

The suggestion that tubal dysfunction was a principle cause of otitis media with effusion was used to account for the universality of the condition in children with cleft palate.

- Stool and randall 1967

Both functional and mechanical obstruction of the Eustachian tube have said to occur in middle ear pathologies.

- Blue stone and berry 1976.

## HYDROPS EX VACUO THEORY:

- Due toe tubal obstruction a negative pressure developed with in the middle ear cleft due to gas absorption.
- As a consequence it was thought that a sterile transtudate formed
- The involment of an inflammatory component originating in the nasopharynx as the cause of middle ear changes is suggested by resembling those found in middle ear- Hemlin – et at : 1991.
- Eustachian tube dysfunction appears to results from failure of any or the component of the cartilaginous pharyngeal tube.
- Mucosal edema may be caused by inflammatory disease, infection, allergy or reflux from nasopharynx.
- Medical treatment should be directed toward the underlying etiology of edema whenever possible and middle ear ventilation with tympanostomy tubes is generally recommended when medical treatment in inadequate.
- The persistence of mucosal disease despite maximal medical treatment and dissatisfaction with tymphanostomy tubes may be considered an indication for tubal surgery – Dennis X Poe MD
- FACS.
- Slow motion endoscopic video analysis is a potentially useful technique in classifying the types of pathological changes in the Eustachian tube. A correlation could not be made between the severity of the middle ear disease and severity of observed Eustachian tube dysfunction.
- Additional studies of dysfunctional tubes are needed to predict outcomes in operative ear cases and to design intra tubal therapy for chronically dysfunctional tubes – Massachusettes Eye and Ear infirmary, Boston, Massachusettes, USA.
- The medial cone like structure is called eustachial tube belows.
- Its opening duration is 2 secs/1-2ms for 3-4/24hrs.

- The middle ear gas diffusion with the circulation by
1) Ventilation diffusion
2) Sniff theory
3) Excess diffusion
- The mucocillary clearance system described by the hilding experiment.
- Jacob sade, Mawson.
- Functional obstruction, intrinsic mechanical obstruction, extrinsic mechanical obstruction leading to Eustachian dysfunction causing SOM, Atelactasis and CSOM.
- Nasal obstruction and allergy causing ETD.
- The presences of non intact TM may produce reflux of secretion into middle ear from nsaopharynx.
- Blustone and C.C.Doyle. , paperlla.

## METHODOLOGY

The materials for the present study of Eustachian tube dysfunction in middle ear pathologies and normal ear for op procedure in Government Rajaji Hospital during the period September 2003 to August 2005 are as follows

1. 4% Lignicaine drop
2. Xylometazoline drops
3. 30° nasal endoscope and cable
4. Cold light source and cable
5. Camera with CCD
6. VCR
7. Television monitor

Case selected where with

**a) Middle ear pathologies : (50 cases)**

1. Chronic suppurative otitis media
2. Adhesive otitis media and
3. Secretory otitis media scan

**b) Normal ear: (10 cases)** After complete ear, nose, mouth examination. Study was conducted.

## DISCUSSION

Out of 60 cases studies

- 80% of individuals with normal tympanic membrane has normal Eustachian tube function.
- 10% of individuals with normal Tympanic membrane has Eustachian Tubal orifice edema
- 10% of individuals with normal Tympanic membrane has mild defect in Eustachian tube dilatation
- Since they have normal TVP muscle action it over comes the pathology to open the Eustachial tube
- The incidence of middle ear pathology is more common in age group 21-30yrs of 46%
- With this finding it indicates slightly higher age group of incidence of middle ear pathology
- The incidence of middle ear pathology is more common in male 58%
- This finding is in accordance with text book descriptions
- Of the middle ear pathology CSOM is more common 70%
- This also closely correlates with the commonest middle ear disease
- Of the CSOM, the Eustachian tube pathology found is compromised Tubal dilatation is mose common 43$
- Of all the Eustachian tube pathology found is compromised Tubal elevation is 52%. The second common is mucosal edema of 36%. Next comes the obstructive causes of 12%.
- This slightly differs from Dennis.S Poe findings that Tubal edema in commoner than compromised Tubal dilatation
- In many cases, both Tubal edema and compromised Tubal dilatation coexist each other, finally causing Eustachian dysfunction.

## CONCLUSION

The study conducted definitely proves correlation between Eustachian tube dysfunction and middle ear pathologies like secretory otitis media, adhesive otitis media and chronic suppurative otitis media.

- Of these CSOM is the commonest
- Eustachian tube dysfunction is mainly due to compromised tubal dilatation
- With availability of nasal endoscope Eustachian tube function can be assessed as OP procedure, which will be helpful pre operative assessment of middle ear surgery outcome
- This study more or less with study of Dennis Spoe MDFACS except for that Compromised Tubal dilation is common than Tubal edema.
- Infuture minimally invasive intra luminal Eustachian tube surgery may be helpful in improving outcome of middle ear surgeries, particularly for graft take up.
- These are infact early days for this study of Eustachian tube dysfunction which need further modification and development. So innovative surgery may emerge ultimately, so middle ear pathologies can be better dealt with.

## REFERENCES


1. Beery QC, Doyle WJ Cantekin EI, Bluestone CD: Longitutudional assessment of Eusta function in children Larygoscope 1979 Sep; 89 (9PT 1): 1446-56 (medline)
2. Bune M, Magnuson B, Falk B, Eustachial tube function varies over till with secretatory otitis media. Acta Otolaryngol 2000 Sep; 120(6) : 716-213 (medline)
3. Bylander A, Tjerdnstrom O, Ilavarsson A: Pressure opening and closing functional of the tube in children and adults with normal ears. Acta otolaryngol 1983 Jan-Feb; 95 (1-2) (medline)
4. Magnusen B, Falk B: Physiology and evaluation of the Eustachial tube. Eustachial malfunction in middle ear disease. In: Alberti P, Ruben R, eds. Otologic Medicine ar New York, NY: Churchchill-Livingstone; 1988: 1153-71.
5. Sade J: Middle ear mucosa. Arch otolaryngol 1966 Aug; 84 (2): 137-43 (medline)
6. Shambaugh GE : The continuously open Eustachian tube. Arch otolarybgol Head 27:420
7. TosM, Bark – Pedersen K: Goblet cell population in the normal middle ear and eusta children and adults. Ann Otol Rhional Layngol 1976 Mar –Apr ; 85 (2 Supp 25 1):4
8. Blue stne, CD and stoll, SE. "otitis Media, Atelectasis Eustachian Tube Dysfunction. "Pediatric Otolaryngology W.B.Saunders Co. 1990.
9. Cummings, CE, et.al. "Anatomy and physicology of the Eustachian tube." Otoloryngology – Head and Neck Surgery. C.V Mosby co. 1986.
10. Doyle, Wj et.al :effect of palatoplasty on the function of the Eustachinan tube in children with cleft palate. "Stool & Bluestone, OMRC Progress Report 1988.
11. JAhn, AF and santod – Sacchi J. "Physiology of the Eustachian Tube and Middle ear Pressure Regulation: Physiology of the Eustachian Tube and Middle ear pressure Regulation. Physiology of the Ear Raven Press 1988.
12. Salder, TW "EAR" Langman's Medical embryology. Williamd & Wilkins 1985.
13. Asbjornsen a, Holmeford A, Register S, et al: Lasting auditory attention impairment after persistent middle ear infections: a dichotic listening study. Dev Med Child Neuro 2000 Jul; 43 (70 481-6 (medline).
14. Bernsetin JM: Immunoloic reactivity 7 in the middle ear in otitis media with effusion. Otolarrymgol Clin North Am 1991 Aug; 24(4) 845-58 (medline)
15. Black s, Shinefield H, Fireman B, et al: Efficacy, safety and immunogenicity of heptavalent pneumococcal conjugate vaccine in childreb. Northern California Kaiser Permanente Vaccine Study Center Group (See comments). Pediatr infect Dis J 2000 Mar: 19(3): 187 -95 (medline)
16. Blustone Cd: eoidemiology and pathogenesis of chronic suppurative otitis media: implications for prevention and treatment . int J Pediator Otorhinolaryngol 1998. Jan; 42(3) 07 – 23 (medline)
17. Contencin P, Maurage C, Ployet MJ et al: Gastroesophageal reflux and ENT disorders in childhood. Inj J Pediator Otorhinolarymgol 1995 Jun; 32 Suppl: Sl 35 44 (medline)
18. Conctencin P, Narcy O: Nasopharyngeal PH monitoring in infants and children with chronic rhinopharyngitis. Inj J Pediatr Otorhinolaryngol 1991 Oct; 22 (3); 249-56 (medline)
19. Daly KA, Giebink GS: Clinical epidemiology of otitis media. Pediator Infect Dis J 2000 May; 19 (5 Suppl): S31-6 (medline)
20. Doyle WJ, Alper CM, Buchman CA, et al: Illness and ontological changes during upper respiratory virus infection. Laryngoscope 1999 Feb; 109 (2 pt 1) :324-8 (medline)
21. Haddad J Jr, Saiman L, San Gabriel P, et al : Nonsusce (tible streptococcus pneumonia in children with chronic otitis medial with effusion and recurrent otitis media undergoing ventilating tube placement
22. Heikkinen T: Role of virues in the pathogenesis of acute otitis media. Pediatric Infectious Disease Journal 2000; 19, No 5: S17 -23 (medline)
23. LLicali OC, Keles N DEger K, et al; Relationaship of passive cigarette smoking tootitis media. Arch Otolarungol Head Neck Surg 1999 Jul; 1125 (7): 758-62.
24. Meek RB 3rd, MC Grew BM, Cuff CF, et al: Immunologic and histologic observations in revirus – induced otitis media in the mouse. Ann Otol Rhinal Laryngol 1999 Jan; 108 (!) : 31-8 (medline)
25. Niemela M, Uhari M, Mottonen M, et al: Costs arising from otitis media. Acta Oaediatr 1999 May; 88(5); 553 – 6(medline)
26. Niemela M, Pihakari O, Pokka t, et al: Controversies in the medical management of persistent and recurrent acute otitismedia. Recommendations of a clinical advisory committee. Ann Otol Rhinal Larybgol 2000; aug; 183: 1-12 (medline)
27. Rinaldo A, Ferlito a, The pathology and clinical features of :glue ear:. A review (In process citation) Eur Arch Otorhinolaryngol 2000; 257 (6) : 300-3 (medline).
28. Rovers MM, Zielhuis ga, Straatman H, et al: Prognostic factors for persistent otitis media with effusion in infants. Arch otolarybgol Head Neck surg 1999 Nov; 125 (11): 1203 -7(medline)
29. Rovers MM, Straatman H, Ingels K, et at : The effect of ventilation tubes on languates development in infants with otitis with effusion. A randomized trial Pediatrics 2000 sep; 106(3) E42(medline)
30. Ruuskanen O, arola M, Putto – Laurila A, et al : Acute otitis media and respiratory virus infections, Pediatr infect dis J 1989 Feb, 8(2): 94-9(medline)
31. Shaw CB Obermyer N, Wetmore Sj, et al: Incidence of adenovirus and respiratory syncytial virus in chronic otitis media with effusion using the Polymerase chain reaction. Otolaryngol Head Neck Surg 1995 Sep; 113(3) : 234 -41(medline)
32. Skull Sa, morris PS, yonovitz a, et al : Middle ear effusion: rate and risk factors in Australian children attending day care. Epidemioll infect 199 Aug; 123 (1): 57-64 (medline)
33. Takahashi M, Peppard J, Harris JP: Immunihistochemical study of murine middle ear and Eustachian tube. Acta Otolaryngol 1989 Jan – Feb; 107 (1-2): 97-103 (medline)
34. Uhari M, Hietala j, tuokko H: Risk of acute otitis media in relation to the viral etiology of infections in children. Clin infect Dis 1995 Mar; 20 (3): 521-4 (medline)
35. US Otitis Media Guideline Panel, Stool SE, US Agency of Health Care Policy Guideline Panel. Rockville, Md: US Dept of Health and /Huma Services, Public Health Sevice; 1994: Clinic practice guideline, No 12
36. Wright CG, Meyerhoff WI: Pathology of otitis media Ann Rhinal laryngol supl 1994 May; 163: 24-6 (medline)
37. Zielhuis Ga, Gerristen AA, Gorissen WH, et al: Hearing dificts at school age; the predictive value of otitis media in infants. Inj J.Pediatr Otorhinolaryngol 1998 aug 10; 44(3) 227-34 (medline).