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## Congenital Absence Of Stapedius Muscle And Tendon: A Case Report.

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### ABSTRACT

Otosclerosis is a term derived from words 'oto' meaning "of the ear," and 'sclerosis' meaning "abnormal hardening of body tissue." The condition is caused by abnormal bone remodelling in the middle ear. Bone remodelling is a lifelong process in which bone tissue renews itself by replacing old tissue with new. During surgery for otosclerosis, it is common for the surgeon to cut the stapedius tendon. Absence of stapedius muscle and its tendon is an extremely rare congenital anomaly, with only nine indexed reports in live patients and few other referred in literature and few found in reference with temporal bone dissections. The conductive hearing loss associated with this makes it one of the least probable differential diagnosis of conductive deafness with unremarkable tympanic membrane with definitive diagnosis being only made during exploratory tympanotomy. The pyramidal process was not developed in most cases. Awareness of the variations or anomalies of the stapedius muscle and tendon are important for surgeons who operate upon the tympanic cavity, especially during surgery for otosclerosis. Here we present a case of absent stapedius tendon and muscle along with pyramid during exploratory tympanotomy in a 15 year male with conductive hearing loss.

**Keywords:** stapedius muscle, Otosclerosis

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## INTRODUCTION

Otosclerosis is a term derived from words 'oto' meaning "of the ear," and 'sclerosis' meaning "abnormal hardening of body tissue." The condition is caused by abnormal bone remodelling in the middle ear. Bone remodelling is a lifelong process in which bone tissue renews itself by replacing old tissue with new. During surgery for otosclerosis, it is common for the surgeon to cut the stapedius tendon. Absence of stapedius muscle and its tendon is an extremely rare congenital anomaly, with only nine indexed reports in live patients and few other referred in literature and few found in reference with temporal bone dissections. The conductive hearing loss associated with this makes it one of the least probable differential diagnoses of conductive deafness with unremarkable tympanic membrane with definitive diagnosis being only made during exploratory tympanotomy. The pyramidal process was not developed in most cases. Awareness of the variations or anomalies of the stapedius muscle and tendon are important for surgeons who operate upon the tympanic cavity, especially during surgery for otosclerosis. Here we present a case of absent stapedius tendon and muscle along with pyramid during exploratory tympanotomy in a 15-year male with conductive hearing loss [1-6].

### Case report

A 15-year-old male presented to Department of otorhinolaryngology with bilateral nonprogressive conductive hearing deafness for 4 years.

There was no history of trauma, discharge and exposure to loud noise and also the young male was healthy with no associated significant family history.

Both tympanic membranes were healthy on oto-endoscopy with Pure tone audiometry showing moderate conductive hearing loss on both sides.

PTA report showed 38 decibels AB gap in left ear and 39 decibels in right ear.

Impedance audiometry showed As curves on both sides.

We planned for right exploratory tympanotomy under local anaesthesia with sedation.

During surgery following Rosen's incision the tympanomeatal flap was raised from 6 o'clock to 12 o'clock and posterosuperior bony overhang was curetted till the stapes footplate was visible.

At this point in surgery, stapedius tendon and muscle were found to be absent.

On further inspection we noticed that the pyramid was also not present.

Apart from this the stapes was fixed and footplate was thickened.

Although, malleus and incus mobility was normal.

No tympanosclerotic patches were seen over tympanic membrane and footplate.

Call for proceeding further was taken and stapes suprastructure was fractured out and a stapedotomy was performed with stapes perforators of size 0.6mm.

A Teflon piston of size 0.6 X 5mm was fixed over the stapedotomy window and incus.

Tympanomeatal flap was repositioned after supporting Teflon piston with abgel. The patient gained hearing on table and after just 3 months he had normal hearing. Later, after 3 months of first surgery right ear was also operated.



**Diagram- Incudo-stapedial joint with absent stapedius tendon**

### DISCUSSION

Awareness of the variations and anomalies of the stapedius muscle and tendon are important for surgeons who operate upon the tympanic cavity, especially during surgery for otosclerosis. The absence of both the stapedius tendon and muscle appears to be a rare congenital malformation of the middle ear. The incidence of the absence of the stapedius tendon has been reported as 0.5%.

Very few cases of the absence of the stapedius tendon and muscle have been reported in the English medical literature. The ossicular chain and their attachment develop from the mesenchyme of the first (mandibular) and second (hyoid) branchial arches.

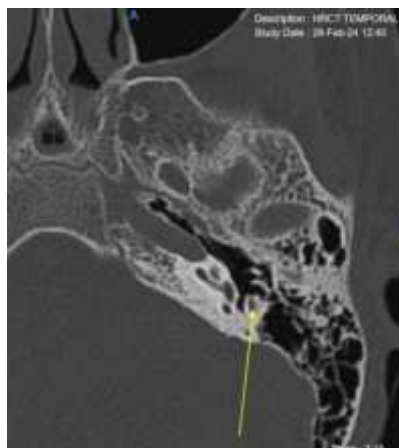
The stapedial reflex is important for protection against hazardous levels of noise, and for improving better speech in the presence of background noise. In the present case of otosclerosis, the diagnosis was made with clinical judgement, PTA and impedance reports.

During exploratory tympanotomy for a diagnosed case of otosclerosis we found that the stapedius tendon and muscle were absent along with pyramid. We appreciated the thickening of footplate and the mobility of incudo-stapedial joint was absent so we confirmed it as otosclerosis. The patient was young and so a call was taken to carry out the stapedectomy as in routine cases.

0.6 X 5mm Teflon piston was used. The surgery was a success and patient's hearing during surgery was improved.

On further follow up after 3 months patient reported to be having a good hearing and this was also confirmed on PTA reports.

The other ear also had no stapedius tendon and was operated 3 months later with similar success.



**Diagram- HRCT temporal bone showing the ossicles with absence of stapedius tendon**



**REFERENCES**

- [1] Kopuz C, Turgut S, Kale A, Aydin ME. Absence of both stapedius tendon and muscle. *Neurosciences (Riyadh)*. 2006 Apr;11(2):112-4. PMID: 22266561.
- [2] Souza JC, Bento RF, Pereira LV, Ikari L, Souza SR, Della Torre AA, Fonseca AC. Evaluation of Functional Outcomes after Stapes Surgery in Patients with Clinical Otosclerosis in a Teaching Institution. *Int Arch Otorhinolaryngol*. 2016 Jan;20(1):39-42.
- [3] Vincent R, Sperling NM, Oates J, Jindal M. Surgical findings and long-term hearing results in 3,050 stapedotomies for primary otosclerosis: a prospective study with the otology-neurotology database. *Otol Neurotol*. 2006 Dec;27.
- [4] Colletti V, Sittoni V, Fiorino FG. Stapedotomy with and without stapedius tendon preservation versus stapedectomy: long-term results. *Am J Otol*. 1988 Mar;9(2):136-41.
- [5] Hough JV. Malformations and anatomical variations seen in the middle ear during the operation for mobilization of the stapes. *Laryngoscope* 1958; 68: 1337-1379.
- [6] Schuknecht HF, Gulya AJ. *Anatomy of the temporal bone with surgical implications*. Philadelphia (PA): Lea-Febiger; 1986. p. 240-269.