The Supra -Tegmen Approach

Manish Munjal, Japneet Kaur, Gopika Talwar, Shubham Munjal

Dept Of ENT, Dayanand Medical College. Civil Lines, Ludhiana, Punjab, India.

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ABSTRACT

Cerebrospinal fluid otorrhea ,brain herniation and superior canal dehiscence are an enigma for the otologist . The access and intervention necessitates a clear knowledge of the anatomy. A suprategmen or the mini middle cranial fossa approach can be utilized in these situations .

Keywords:
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Dehiscence, Middle Cranial Fossa
Approach, Cerebrospinal Fluid
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Corresponding Author: Dr Manish Munjal, Dept Of ENT, Dayanand Medical College. Civil Lines, Ludhiana, Punjab, India.
INTRODUCTION:

The middle cranial fossa has its floor which is thin and separates it from the Eustachian tube ventilated middle ear cleft. The partition wall which caps the anterior part of the cleft, that is the middle ear cavity is captioned the tegmen tympani proper while that which covers the posteriorly placed Antrum, the "tegmen antri". The thickness of the tegmen varies in individuals and in pathologic states like osteopetrosis and. Hyperaemic decalcification in insidious middle ear mucosal inflammatory states and osteitic erosions breach this tegmen.

Literature abounds with mention of congenital dehiscences and likelihood of silent intracranial manifestations involving the temporal lobe. The thin tegmen is likely to give way spontaneously or post trauma with a sequel of crystal clear cerebrospinal fluid leak which maybe felt as salty fluid trickling in the throat or out of the nose, in cases of intact ear drum and intact skin of the ear canal, when it is labelled as cerebrospinal fluid oto-rhinorrhea. In perforated eardrum the fluid flows out of the ear, and unresponsive to third generation antibiotic coverage.

Spontaneous leaks are secondary to hypocalcemia in heavy females or in intracranial space occupying lesions while traumatic may have a cranial vault external blow or an iatrogenic otogenic or neurosurgical etiology. Vertigo with features of tinnitus on exposure to loud sounds are attributed to a dehiscence of the bone overlying the superior semicircular canal.

DISCUSSION

Spontaneous CSF otorrhoea is rare entity, (1,2) can be easily missed in adults and often not diagnosed until a myringotomy or tympanostomy tube is placed. Any patients, especially adult older than 50 years with a negative history of otologic disease who have recurrent serious otitis media should be evaluated for this pathology. There is no doubt that the condition needs immediate attention and correction because of risk of devastating meningitis infection.

Usually, CSF leak can result from a defect in the dura and skull base. CSF leaks can be associated with or without skull-base defect (4) or cephaloceles and can be further classified into congenital, spontaneous, or secondary (traumatic, iatrogenic or due tumor) Connor et al. [3] The majority is due to secondary related to trauma. [3] Iatrogenic CSF leaks can seldomly be seen in any middle ear surgeries, especially with eroding pathology, Wootten et al. [5]

There are two well known surgical approaches for CSF otorrhoea and superior semicircular canal dehiscence namely, the middle fossa craniotomy and the transmastoid approach. (1,6) In tegmen discontinuity, a bimodal, superior as well an inferior approach would be the ideal modality to assess the pathology and intervene likewise. A cortical mastoid approach with anterior aditus extension to complete the epitympanectomy is completed to delineate the floor side of the tegmen.

Meticulous drill work extending back from between the superior and inferior limbs of the zygomatic arch to the sino dural angle, just below the inferior temporal line, demarcates the upper limit of dissection. The bone work in the triangle between the sigmoid plate and the posterior meatal wall, completes the cortical mastoidectomy. This gives a "ceiling" view of the defect in the tegmen in cases of cerebrospinal fluid leaks and brain herniations.
Drill work parallel and just above the tegmen or the inferior meatal line, with the same anterior and posterior limits, as the inferior dissection is carried out (Picture 1). The dura is identified and carefully elevated off the roof of the tegmen. This creates the suprategmen window. The entire tegmen can now be viewed from its superior and inferior aspect. Interventions in case of brain herniations, CSF leaks, superior canal dehiscence, can be undertaken under vision and a better control, rather than in a blind manner in the inferior or ceiling only approach. The herniations can be lifted off the tegmen defect and a big defect covered by a concavo convex shaped cymba concha carrilage or a bony iliac crest graft. Temporalis fascia or fascia Lata can be placed over the dural covering. In small tegmen breaches and cerebrospinal fluid leaks fascia alone can suffice. Fibrin glues can even be used to achieve air tight seals. In superior canal dehiscence, the arcuate eminence region can be sealed by bone patte with fascia Lata.

**CONCLUSION**

Recognition of CSF otorrhea can be difficult and challenging as the complication can be devastating and serious. Repairing the defect is mandatory to prevent these complications. Different technique and approaches had been attempted with varieties of materials with almost similar results. For an otologist, transmastoid approach can be considered a good approach for repairing, except if there are multiple defects where middle cranial fossa approach will be adequate. Supra tegmen or mini middle cranial fossa approach is can be utilized in cases with limited tegmen erosion provided there is sound anatomical knowledge of anatomy of the middle cranial fossa floor and tegmen anti.

**REFERENCES**


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