

CASE REPORT

Brain Herniation from Tegmen Tymphani Defect Secondary to Middle Ear Polyp Surgery

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ABSTRACT

BACKGROUND: Causes of brain herniation through tegmen tymphani defect are congenital, trauma, chronic infections, tumor, idiopathic and very rarely iatrogenic. Brain herniation through tegmen tymphani defect following middle ear and mastoid surgery was a well known complication in the beginning of twentieth century. With the advancement of antibiotics, operative microscope and drills, brain herniation through tegmen defect is now a rare phenomenon¹. We hereby report a rare case of brain herniation through tegmen tymphani defect following a middle ear polyp surgery.

Keywords: brain herniation, tegmen tymphani

INTRODUCTION

Causes of brain herniation through tegmen tymphani defect are congenital, trauma, chronic infections, tumor, idiopathic and very rarely iatrogenic. Brain herniation through tegmen tymphani defect following middle ear and mastoid surgery was a well known complication in the beginning of twentieth century. With the advancement of antibiotics, operative microscope and drills, brain herniation through tegmen defect is now a rare phenomenon¹. We hereby report a rare case of brain herniation through tegmen tymphani defect following a middle ear polyp surgery.

CASE PRESENTATION:

A 24 year old lady presented with history of mass protruding from right external auditory meatus since 2 months(fig 1). Along with the protrusion there was history of clear fluid discharge from right ear. She underwent right mastoidectomy for middle ear polyp 4 months back at a private hospital.

Patient had no complaints of fever, headache, giddiness or seizures. She presented at our hospital 4 months after the procedure. Her clinical examination showed a 10mm soft mass at the right external auditory canal entrance. Her neurological examination was normal with no deficits and without any signs/symptoms suggestive of meningitis. She was further investigated with a temporal computed tomography (CT) and Magnetic Resonance Imaging (MRI). CT showed a defect of 10mm in tegmen of right temporal bone(fig 2) while MRI showed a similar defect in tegmen of right temporal bone with herniation of isointense tissue suggestive of focal herniation of brain parenchyma(fig 3). Patient was taken for surgery by neurosurgery and Otorhinolaryngology consultants. Initially a right temporal mini craniotomy was done. Herniated brain tissue was identified and removed. The defect in the temporal bone was sealed with bone grafts from craniotomy bone segment using fibrin glue (fig 4). No complications like meningitis, otorrhea or recurrence were seen in the post-operative period. Patient has been in follow-up since 1 year and no complication has been noted so far.

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Figure 1: Mass protruding from right external auditory meatus

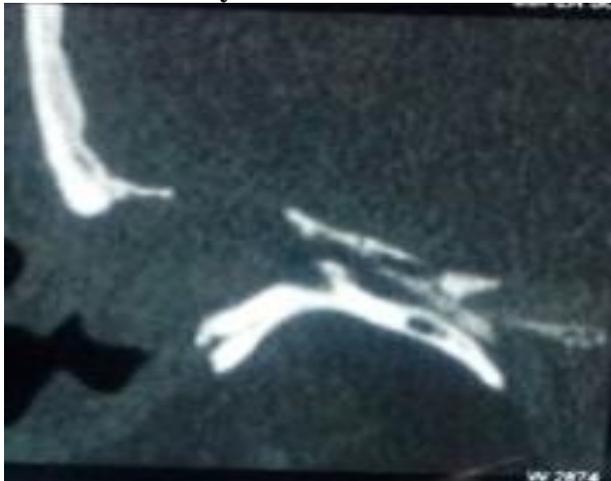


Figure 2: CT showing a defect of 10mm in tegmen of right temporal bone.



Figure 3: MRI showing a defect in tegmen of right temporal bone with herniation of isointense tissue suggestive of focal herniation of brain parenchyma.



Figure 4: Defect noted in tegmen after temporal craniotomy.

DISCUSSION

Common causes of brain herniation through tegmen defects are congenital tegmen defects, congenital labyrinthine abnormalities, traumatic brain injuries, chronic ear pathologies and surgeries related to it and occasionally idiopathic. Most common condition leading to tegmen defects are chronic ear pathologies and surgeries of this condition². It is difficult to determine whether the chronic pathology or the surgery is the main cause of defect in many cases. But overall there is decrease in the incidence of herniation through tegmen defects due to the advancement of antibiotics controlling chronic ear conditions and improvement in the drills and instruments used in surgery¹. Surgical approaches for treatment of tegmen defect are transmastoid approach, middle cranial fossa approach and combination of both³. Neurosurgical approach is from above and temporal or temporo-parietal craniotomy is done for correction of the herniation. The otosurgical approach is from below using standard mastoid surgical techniques. Selection of approach depends upon site and size of defect. Various substances like fascia, cartilage, muscle, bone or fibrin glue can be used for repairing the defect. Selection of tissue for repair depends upon site of defect, size of herniated tissue and surgeon's experience. In our case an intracranial approach was used by temporal craniotomy. The herniated tissue was removed, repair done using temporalis fascia

and cartilage while bony reconstruction done using bone graft and fibrin glue. Postoperative complications include recurrence of defect, CSF Otorrhea, Meningitis, transient ischemic attack/stroke, sensorineural hearing loss and temporal lobe seizures⁴. However none of these complications were seen in our patient during follow-ups.

CONCLUSION

Brain herniation through defects into the middle ear and mastoid has been reported earlier in the literature. However its incidence has been reduced in the 21st century with advancement of medical sciences. Any abnormal sign or symptom after treatment of middle ear pathology or its surgery should alert the clinicians. Timely intervention can ensure complete recovery without complication of this condition.

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