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Case Report

Ear, Nose and Throat Section

Unilateral Traumatic Atresia of External Auditory Canal: A Case Report

PRIYA KANAGAMUTHU[1], SANDEEP UNNIKRISHNAN[2], RAGHVI ANAND[3]

ABSTRACT

External Auditory Canal (EAC) atresia, which can be acquired or congenital, is a condition in which the EAC is not present. A blind sac in the external acoustic meatus is the result of intraluminal or extraluminal processes of various aetiologies, which can lead to acquired atresia of the EAC. Acquired EAC atresia is a rare disorder of the EAC, and it is extremely uncommon for it to be brought on by direct trauma. In present investigation, a 31-year-old female patient, leading to onset of right temporal discomfort and impaired hearing in the right ear. On examination, a 10×1 cm tender scar was present extending from right parietal region till right zygomatic arch with stenosis in the right external auditory meatus. Facial nerve examination revealed loss of wrinkling on right side with slight deviation of the angle of mouth to left side. High Resolution Computed Tomography (HRCT) temporal bone showed soft tissue causing complete occlusion of right EAC. Patient underwent right EAC atresiaplasty with canaloplasty and canal reconstruction. Facial nerve weakness persisted postoperatively. Patient is still on follow-up and has improved symptomatically with no restenosis. Surgical management of EAC atresia is very challenging, thus it needs meticulous planning and long term follow-up for good results which was evident in the present case.

Keywords: Canaloplasty, Facial nerve, Meatoplasty, Restenosis

CASE REPORT

A 31-year-old female patient came with complaints of pain over the right temporal region for past five months following an alleged history of Road Traffic Accident (RTA). Patient also gave history of right ear discharge which settled with medications and loss of consciousness for few minutes postroad traffic accident. No history of vomiting, seizures or visual disturbances postroad traffic accident was present. Patient complained of impaired hearing in right ear but no complaints with respect to left ear. No known co-morbidities and no significant family history were present.

On examination, a 10×1 cm scar was present extending from right parietal region till right zygomatic arch with tenderness over the scar [Table/Fig-1]. Tenderness was also present over right preauricular and postauricular region. Stenosis was present in the right external auditory meatus hiding the visibility of the tympanic membrane. There was tenderness over the stenosed area. Facial nerve examination showed loss of wrinkling on the right side with slight deviation of the angle of mouth to left side.

[Table/Fig-1]: Post-traumatic right ear showing External Auditory Canal (EAC) atresia.

Patient was provisionally diagnosed to have right ear External Auditory Canal (EAC) atresia secondary to trauma with right sided facial nerve palsy. Photographs were taken after obtaining informed and written consent from the patient.

Pure tone audiometry could not be performed due to severe tenderness over right EAC. High Resolution Computed Tomography (HRCT) temporal bone revealed soft tissue causing complete occlusion of right EAC and filling entire middle ear and mastoid air cells [Table/Fig-2].

[Table/Fig-2]: High resolution computed tomography temporal bone-axial view showing right External Auditory Canal (EAC) atresia (Blue arrow).

A diagnosis of right ear traumatic EAC atresia with right sided facial nerve palsy was made and after getting proper consent patient was taken for right EAC atresiaplasty with canaloplasty and canal reconstruction.

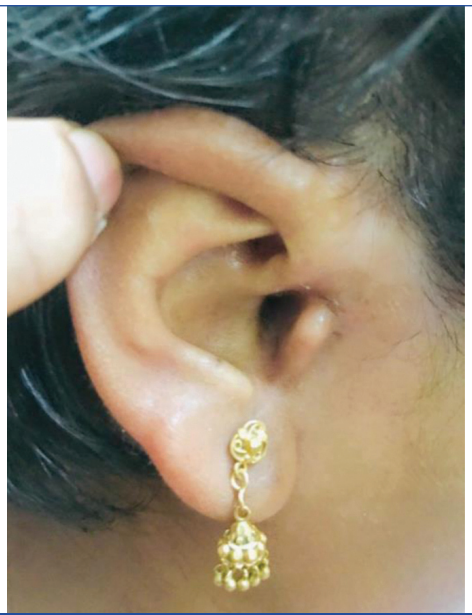
Operative Procedure

Under general anaesthesia with orotracheal intubation, patient was placed in supine position with head turned to left side, parts painted and draped. Local infiltration was given with premixed xylocaine with adrenaline in the stenosed part of EAC. Circular incision was made in the external auditory meatus and soft tissues were removed. Local infiltration given in the postauricular region, William Wilde's incision was made and periosteum was elevated. Cartilagenous part of EAC was found in fragments and firmly attached to surrounding soft tissues and the same was removed. Tympanomeatal flap was found to be unhealthy and the same was removed. Small perforation

was noted in anteriosuperior quadrant of tympanic membrane. Bony part of EAC widened using diamond burr. The postaural incision was extended superiorly, temporalis fascia was harvested . The perforation was sealed by overlay technique using temporalis fascia. Gel foam placed in bony part of EAC. A stent was kept by using a 1cc syringe which was cut into half and placed up to bony cartilagenous junction of EAC and gel foam was placed surrounding it. Postauricular incision was sutured and stay sutures applied to stent [Table/Fig-3] and mastoid dressing done. Complete haemostasis was maintained throughout the procedure. Patient was extubated and shifted to postoperative care unit under stable condition.

[Table/Fig-3]: Immediate postoperative image of right ear showing stent placed upto bony-cartilagenous junction of External Auditory Canal (EAC).

Facial nerve weakness persisted postoperatively. Hence, patient was managed with oral steroids, physiotherapy, facial exercises and eye care. The stent was removed after a period of four weeks during postoperative visit. Patient is on continuous follow-up and facial nerve weakness has improved. No restenosis has so far occurred [Table/Fig-4].



[Table/Fig-4]: Four months postoperative image showing good recovery with no evidence of restenosis of right ear.

DISCUSSION

The EAC atresia can be of two types, acquired or congenital It is a condition in which there is an absence of a patent EAC [1,2]. Atresia can be membranous or solid. Congenital aural stenosis can be divided into three subgroups: (i) stenosis combined with cholesteatoma; (ii) stenosis combined with hearing loss; (iii) stenosis without cholesteatoma and with normal hearing. The degree of stenosis (diameter) and curvature of the osseous EAC are risk factors for EAC cholesteatoma formation [3,4].

Acquired EAC atresia is a rare disorder of the EAC [5,6]. A number of factors, including inflammatory diseases, trauma, burns, and surgery, can result in acquired atresia of the EAC. Chronic inflammation in EAC leads to subepithelial inflammation caused by the invasion of inflammatory cells, which causes fibrosis of the canal resulting in EAC stenosis [7]. Chronic otitis external is one of the most typical causes of acquired EAC atresia [8]. However, several reported series characterised these patients as idiopathic, since they were unable to identify a specific aetiology for the inflammatory process affecting the EAC while others raised the possibility of a connection with systemic dermatologic disorders like eczema or lichen planus, which can affect the skin around the auditory canal [9]. There are only very few cases of post-traumatic atresia [10,11].

In the present case report, patient complained of pain over the right temporal region for past five months following an alleged history of road traffic accident. HRCT temporal bone revealed soft tissue causing complete occlusion of right EAC. This was similar to a study by Sahoo SR and Sarma M, where a 37-year-old male with a history of RTA 10 years back, had bleeding from left ear and decreased hearing [12]. CT revealed soft tissue density causing stenosis of left EAC.

Surgery should be the treatment of choice in post-traumatic EAC stenosis. The goal of the surgery is to remove the fibrous plug/debris, widen the bony EAC, expose the tympanic membrane, and recreate an epithelial lined EAC. Complete resection of fibrous plug with canalplasty and re-epithelisation of EAC with split skin thickness skin grafts should be the treatments of choice to achieve a patent EAC for a long period of time [13-15]. By performing canaloplasty and meatoplasty frequently and carefully arranging skin grafts, it is possible to halt the formation of granulation tissue and further scarring [16]. In this case, a postaural approach was taken and atresiaplasty with canaloplasty was done along with canal reconstruction.

According to the study by Zeeshan S et al., where a patient with a history of burn injuries to left ear had presented with gross deformity, resulting in complete occlusion of the EAC [17]. HRCT scan of temporal bone had demonstrated complete occlusion with a soft tissue density lesion filling the left EAC. Similar to the present case report, postauricular approach was used. After removal of cholesteatoma debris and the reconstruction of the atretic portion of EAC, the bare area had been covered with redundant skin obtained from the fibrous partition, augmented with wide meatoplasty. Regular dressing of the wound had been done using hydrogen peroxide, oxum spray, povidone iodine and the ear canal antibiotic merocel packs had been periodically replaced to prevent restenosis whereas in present case report, an EAC stent was used for period of four weeks instead.

Split-thickness Skin Graft (STSG) reconstruction with conchomeatoplasty, canaloplasty, and atresiaplasty is another treatment option and a satisfactory surgical outcome may depend on the use of an STSG [18]. Another option is modified meatoplasty for EAC stenosis with endoaural-conchal incision [19]. It offers a functionally adequate and cosmetically acceptable result. Another technique is an endaural approach with the use of either alloderm or epidermal allograft instead of a skin graft. The rationale for this application was to eliminate the donor site, adding to ease of the surgery and the postsurgical care. This also reduces cost associated with surgical supplies and operating time [20].

Some studies show that stenosis of the EAC is particularly challenging to cure and has a high rate of recurrence after therapy [21-23]. The likelihood of restenosis, which is brought on by granulation and secondary healing, presents a problem in the treatment of this condition [24,25]. As seen in some studies, early restenosis is typically caused by poor surgical technique that leaves the fibrous plug partially in place or does not adequately cover the

exposed bone [9,12,26]. In the present case report, no restenosis has so far occurred.

CONCLUSION(S)

The present case report was of right ear traumatic EAC atresia. Postauricular approach was used and atresiaplasty with canaloplasty was done along with canal reconstruction. The stent used in this case was not only beneficial in achieving good postoperative result but was also cost-effective. Thus, in order to obtain the desired result, meticulous preoperative planning should be done followed by periodic postoperative visits to monitor for restenosis.

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PARTICULARS OF CONTRIBUTORS:
1. Professor, Department of Otorhinolaryngology, Chettinad Academy of Research and Education, Chettinad Hospital and Research Institute, Chennai, Tamil Nadu, India.
2. Professor, Department of Plastic Surgery, Chettinad Health City, Chennai, Tamil Nadu, India.
3. Junior Resident, Department of Otorhinolaryngology, Chettinad Academy of Research and Education, Chettinad Hospital and Research Institute, Chennai, Tamil Nadu, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Dr. Priya Kanagamuthu,
No. A 6 Ground Floor Staff Villa Chettinad Health City, Chennai, Tamil Nadu, India.
E-mail: catchpriya.29@gmail.com

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