

Auricular Appliance for Maintaining Patency in a Rare Case of Choristoma of the External Acoustic Meatus: A Case Report

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Abstract

Background and Aim: Choristoma is a benign developmental pathological growth characterized by excessive proliferation of mature tissue in ectopic sites. While it can manifest anywhere in the head and neck region, choristoma of the middle ear is more prevalent than the external and internal ear.

Case Presentation: Choristoma is a benign developmental pathological growth characterized by excessive proliferation of mature tissue in ectopic sites. While it can manifest anywhere in the head and neck region, choristoma of the middle ear is more prevalent than the external and internal ear.

Conclusion: This case underscores the significance of early diagnosis and intervention in managing external ear choristoma to prevent complications such as conductive hearing loss. The use of auricular prosthesis post-surgery shows promise in maintaining patency and minimizing the risk of relapse, emphasizing on the importance of long-term follow-up in such patients.

Key Words: Choristoma; Ear, External; Prosthesis Design

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Introduction

Choristoma is a congenital pathological benign growth characterized by an excessive proliferation of the mature tissue in an ectopic position [1]. It may occur at various sites in the head and neck region some of which include salivary choristoma of the middle ear [2], lymph node choristoma of the middle ear, and ectopic tissues of gastric mucosa in the upper respiratory tract [3]. Conductive hearing loss may be defined as a state in which there is an abnormal transmission of sound impulses

starting from the external auditory canal to the conchae. This may occur due to any pathology or blockade from the pinna or involving the external acoustic meatus to the stapes [4,5].

Choristoma within the external acoustic meatus impedes sound wave transmission, causing conductive hearing loss. This abnormal tissue obstructs the passage of sound from the external environment to the inner ear, resulting in impaired auditory function. Choristoma removal surgery aims to eradicate this obstruction, restoring the natural pathway for

sound conduction. By excising the abnormal tissue, the obstruction in the external auditory canal is eliminated, allowing sound waves to reach the eardrum unimpeded. Consequently, the conduction of sound waves is enhanced, leading to improved hearing ability. This surgical intervention directly addresses the underlying cause of conductive hearing loss, offering a significant improvement in auditory function and overall quality of life for affected individuals [6,7]. The reported cases of choristoma involving the external acoustic meatus are rare in the literature.

This case report gives a detailed insight of prosthetic management for maintaining the patency of external acoustic meatus after choristoma removal surgery to prevent relapse.

Case Presentation

Patient information:

A 6-year-old male patient was referred from the department of ENT, Chettinad Academy of Research and Education to the Department of Pedodontics and Preventive Dentistry, Chettinad Dental College and Research Institute for post-surgical management after choristoma removal for maintaining the patency of the external acoustic meatus. The patient gave a history of conductive hearing loss due to the presence of choristoma from birth in his left external acoustic meatus blocking the external auditory canal of the same side. The first choristoma removal surgery was done 1 year back. Previous surgical reports revealed the closure of the surgical site due to failure to maintain the patency after surgery. Thus, the second surgery was done 1 month before the fabrication of the appliance and the patient was given a window period of 1 month for primary healing. No relevant medical or family history was present. The patient was not under any medication. Thus, the aim of the treatment was to provide an auricular appliance for maintaining the patency of the external acoustic meatus.

Clinical findings:

On clinical examination, the child was healthy and active. No deformity of the external ear was seen except for the surgical site. On further examination, the opening of the external acoustic meatus was 2 x 2 mm in a relaxed state.

Therapeutic intervention:

The treatment plan was to fabricate an auricular appliance with chemical-cure transparent acrylic material.

Ethical considerations:

The treatment plan was explained to the patient in detail in the form of a patient information sheet and a written informed consent was obtained from the patient's parents.

Fabrication of auricular appliance (Figure 1):

Impression making:

The patient was asked to lie down in the right lateral recumbent posture in the dental chair. A 19-gauge stainless-steel wire was bent to capture the inner anatomy of the external auditory canal up to 3 mm from the orifice. The trial was done with a 19-gauge wire to make sure not to cause any iatrogenic injury. Light body rubber-based impression material was used to make the impression of the external auditory canal up to 3 mm along with the orifice of the external acoustic meatus up to the tragus on the left side. The remaining part of the pinna was recorded using putty impression material. The impression was then retrieved slowly without injury.

Cast and appliance fabrication:

The cast was poured using plaster of Paris and retrieved after complete setting. A 19-gauge stainless-steel wire was bent according to the anatomy of the pinna. This wire component was connected to the inner acrylic core and the outer acrylic part behind the pinna. The inner acrylic core consisted of an acrylic bulb which extended 3 mm into the auditory canal. Cold mold seal was applied to the obtained cast for easy removal after acrylization and the wire component was

placed after the necessary relief using the modelling wax. The appliance was then acrylized using chemical-cure acrylic resin. The appliance was retrieved from the cast, trimmed, and polished. The size of the bulb was maintained at 2 x 2 mm initially. Trial fitting was done and adjustments were made to the exact size of the orifice in the patient. After final adjustments, the appliance was inserted.

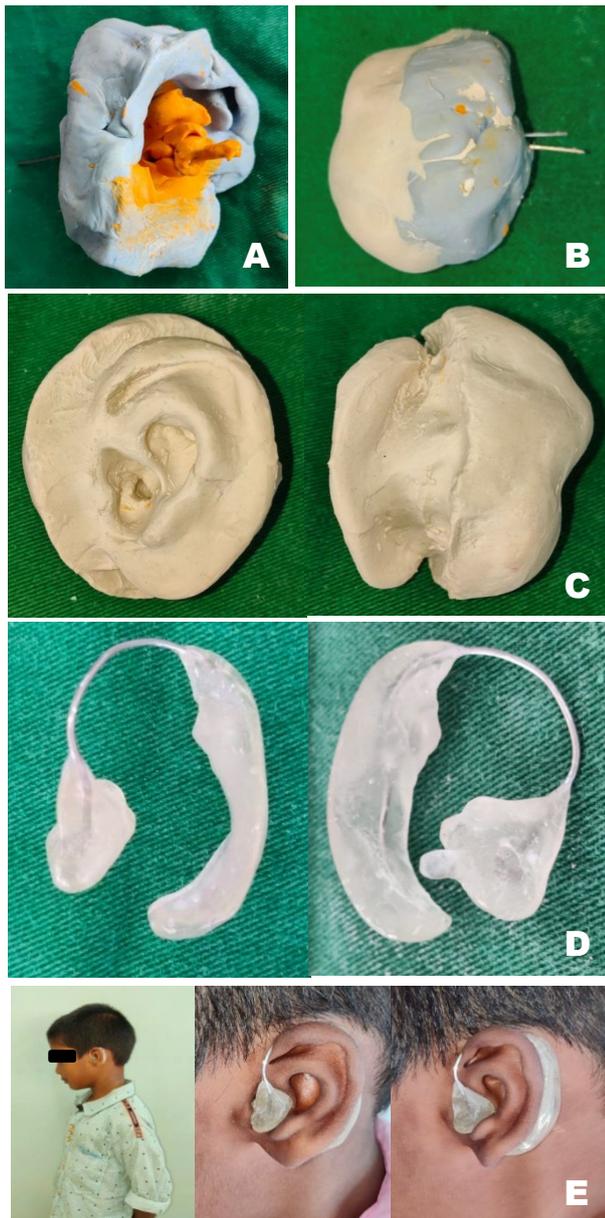


Figure 1. Fabrication of auricular appliance. (A) Lightbody and putty impression material; (B) Plaster of Paris cast poured; (C) Cast retrieved; (Left) Opening of the external acoustic meatus; (Right) Preauricular view; (D) Appliance fabricated, trimmed, and polished; (E) Inserted appliance

Follow-up and assessment:

The patient was followed up after one week to check if he was wearing the appliance regularly. The patient was followed up at 3-month and 6-month intervals. There was slight deformation of the wire component during the 6-month follow-up which was reshaped and adapted to the contour of the pinna. At the 3-month follow-up, the external acoustic meatus patency was maintained at 2 x 2 mm. Thus, the inner acrylic bulb was increased in size by 2 mm in an attempt to increase the orifice size. At the 6-month follow-up, the patency of the external auditory meatus was assessed. The patency was not increased in size, and the initial size of 2 x 2 mm was maintained to prevent relapse.

Discussion

Choristoma can be referred to by various terms like heterotopic tissue, ectopia, congenital heterotopic remnants, or aberrant debris. Salivary gland choristoma is the most common type of choristoma of the head and neck region. Most of these remain an asymptomatic benign growth, which does not require any intervention unless and until needed. There are various possible reasons for the development of choristoma some of which include aberrant vestigial structure growth, partial dislocation of a decisive primitive organ during mass movement, and aberrant local tissue differentiation [8,9]. Apart from salivary gland choristoma of the ear, cases have been reported with presence of cartilaginous choristoma in the external auditory canal [10]. Choristoma removal for the present case was done to remove the blockade in the external acoustic meatus to resolve the conductive hearing loss.

Most of the cases with middle ear choristoma are associated with conductive hearing loss due to interference in the conduction of auditory impulses [11-13]. Choristoma of the middle ear cavity is most often associated with syndromes

involving the first and second branchial arches [14,15]. However, in the above-mentioned case, there was no other deformity of the ear or associated syndrome. Choristoma of the middle ear cavity is often accompanied by otorrhea, perforation of the tympanic membrane, and narrowing of the external auditory meatus. The symptoms subsided after surgical removal of the mass. However, no mention of the treatment of narrowed external auditory meatus was evident. Congenital profound hearing loss accompanied by salivary gland choristoma with facial palsy showed significant improvement after surgical removal. It was diagnosed that the salivary gland mass was the key factor for conductive hearing loss. The mass's size and placement influence how it is managed. When the mass is closely related to the facial nerve, a conservative approach, biopsy, and serial examination have been advised. This is mainly applicable to adult patients [16]. Although there are many reported cases of narrowing of the external auditory canal in cases with choristoma and even in the post-surgical period, there are only few cases reported on post-surgical prosthetic management for maintaining patency [11]. Maintaining patency of the external auditory canal is essential to treat conductive hearing loss [1]. Thus, the scientific rationale behind this case report is the literature gap and lack of established evidence about the success of post-surgical appliance therapy after choristoma removal. The custom auricular appliance detailed in this report offers a pragmatic approach to post-surgical management following choristoma removal, ensuring the maintenance of the external auditory meatus patency. Constructed with transparent acrylic resin, it prioritizes patient comfort while effectively preventing relapse of conductive hearing loss. Clinically, this appliance serves as a valuable adjunct in day-to-day practice, providing a non-

invasive solution that enhances patient outcomes and reduces the necessity for further surgical interventions. Its ease of fabrication and customization make it a practical choice for addressing similar cases, offering clinicians a reliable tool to optimize patient care and minimize disruption to their daily lives. As such, this appliance represents an important advancement in management of choristoma-related hearing impairments, contributing to improved quality of life for affected individuals.

Strengths and limitations:

Since the child was referred for post-surgical management after choristoma removal, the nature of the lesion was not fully understood. The history and surgical and post-surgical healing events were not fully investigated by us. Coming to the appliance fabrication part, this appliance was fabricated for a temporary purpose with chemical-cure acrylic resin. The long-term use of the appliance is questionable. However, the appliance was fabricated for immediate management, and the 6-month follow-up showed better results. This auricular appliance helps to maintain patency and prevent relapse, thereby decreasing the need for a second surgery.

Conclusion

In conclusion, this case report highlights the successful post-surgical management of a rare case of choristoma involving the external acoustic meatus in a pediatric patient. Through the fabrication of a custom auricular appliance, the patency of the external auditory meatus was effectively maintained, thereby preventing relapse and improving conductive hearing loss. Despite limitations such as the temporary nature of the appliance and incomplete understanding of the lesion's nature, the 6-month follow-up demonstrated promising results. The literature review underscores the scarcity of evidence

regarding post-surgical prosthetic management for maintaining external auditory meatus patency following choristoma removal. This case contributes to bridging this gap, offering insights into a potential therapeutic approach for such cases. Further research and long-term follow-up studies are warranted to validate the efficacy and durability of this management strategy.

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