Granuloma of the External Auditory Canal Causing Stenosis: A rare case report

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ABSTRACT

Ear canal granuloma is a local formation of specific cells, including macrophages and lymphocytes, revealing a chronic inflammatory reaction against infection, often due to intracellular agents in the external auditory canal. These nodular inflammatory lesions are formed from the ineffectiveness of mononuclear phagocytes as an immune defense in digesting pathogens. A 21-year-old female patient presented to the Otorhinolaryngology Clinic of Universitas Islam Indonesia (UII) Hospital with continuous pain that interferes with daily activities, sensation of fullness, and decreased hearing in the left ear since one week ago. Local area examination revealed that only lateral 1/3rd of external auditory canal (EAC) was visible; the remaining medial 2/3rd was filled with a reddish mass and secretions without bleeding. Radiological examination of the mastoid in Schuller's position showed obliteration of the left EAC, no bone destruction, and the mastoid air cells of the right and left EAC within normal limits, indicating left EAC granuloma. The entire granulation tissue was removed under general anesthesia through granulomectomy procedure using a granulotomy. 2 weeks after granulomectomy, the tissue regrew and caused total stenosis. Total stenosis was treated with chemical cauterization and periodic tampons to maintain the lumen of the EAC. At the latest follow-up 1-year postoperatively, the patient had no complaints and EAC was within normal limits. Despite the rarity of ear canal granuloma, this case is challenging to both patients and doctors because they require long-term care and regular follow-up. Such case also necessitates supporting examinations such as audiogram, X-ray of mastoids, and/or CT scan of the temporal bone to rule out the differential diagnosis such as underlying cholesteatoma or the presence of neoplasms.

Keywords: Granulomatous, External auditory canal, Stenosis.

INTRODUCTION

Granuloma is abnormal body tissues that arise as a result of an inflammatory process. Granuloma may appear as a reaction to infection, irritation, or exposure to a foreign body. This abnormality can be seen as a collection of inflammatory cells in the tissue under microscopic examination. These nodular inflammatory lesions are formed from the ineffectiveness of mononuclear phagocytes as an immune defense in digesting pathogens [1].

The granulomatous disease of the ear can be localized in the ear canal and its surrounding tissues, or it can be a manifestation of systemic disease, such as in Wegener's granulomatosis, and histiocytosis X. Ear canal granuloma can also arise as a manifestation

of CSOM (Chronic Suppurative Otitis Media), malignant otitis externa and in patients with recurrent otitis externa. Symptoms in these diseases may not be specific, but each has characteristics that enables comparison between each other [1,2]. Granuloma can also occur due to trauma to the ear canal or the presence of a foreign body in the ear that can cause an inflammatory reaction [3].

If granulation tissue is allowed to develop, it will eventually lead to a fibrous plug. The fibrous plug will cause ear canal stenosis. Ear canal granuloma is rare, with an estimated incidence of 0.6 cases per 100.000 people. Although ear canal granuloma is rare, they challenge both patients and doctors because they require long-term care and follow-up and a high recurrence rate. [4].

CASE REPORT

A female patient, aged 21 years, came to the Otorhinolaryngology Clinic at UII Hospital with complaints of pain in the left ear since one week ago. The left ear pain was continuous, to the point of interfering with daily activities. Complaints are accompanied by a sense of fullness and decreased

hearing in the left ear. Nothing aggravates nor relieves complaints. History of discharge from the ear canal, ringing in the ears, fever, and history of dizziness were denied. There were no complaints in the right ear, nose, or throat. The patient said he had received cerumen evacuation and had diffuse otitis externa with topical ear drops and oral painkillers. The patient had no history of otitis media, trauma, or surgery related to the ear. History of diabetes mellitus, hypertension, and other systemic diseases were denied.

On physical examination, the general condition was good, compos mentis consciousness, blood pressure at 110/70 mmHg, pulse 78 times/minute, temperature at 36.5°C, respiratory rate 18 times/minute, and pain scale 5. Physical examination on the head, neck, thorax, abdomen, and limbs showed no abnormalities. From the ear examination, the left outer ear was normal, there was no deformity in the earlobe, auricular pulling pain (+), hyperemia (-), edema (-), preauricular skin color is the same as the neighboring skin, tragus tenderness (+), fistula (-), edema (-), abscess (-), retro-auricular area did not appear hyperemic (-), tenderness (-), lump (-), fistula (-), no mass. Otoendoscopic examination of the left auricle revealed that only lateral 1/3rd of the external auditory canal (EAC) was visible while the remaining medial 2/3rd was filled with a reddish mass with secretions but without bleeding (Figure 1). When sondage was performed, there was resistance on the posterior EAC wall, and the tympanic membrane cannot be evaluated. Examination of the right ear auricle, EAC, and the tympanic membrane was within normal limits. Examination of the nose and throat was within normal limits.

Figure 1 Granuloma of the external auditory canal sinistra

The patient was planned to undergo middle ear evaluation through radiological examination of the mastoid in Schuller's position and the results showed obliteration of the left EAC, no bone destruction, and the mas-

toid air cells of the right and left EAC within normal limits, supporting the diagnosis of left EAC granuloma (Figure 2). Blood laboratory examinations were within normal limits.

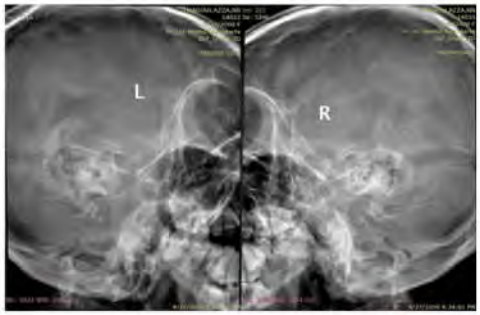

Figure 2 Radiological examination of the mastoid in Schuller's position

The patient underwent a granulomectomy procedure in the operating room under general anesthesia and prophylactic antibiotic injections. The operation was performed using a granulotomy to remove the entire granulation tissue. Bleeding control of bleeding was performed using adrenaline tampon 1: 10.000 and insertion of EAC tampon with chloramphenicol ointment. Postoperatively, the patient was given adequate antibiotic and analgesic pharmacotherapy, and on the 2nd postoperative day, the patient was allowed to be discharged. On the 5th post-operative day, the EAC tampon was removed, the ear canal appeared normal, an aural toilet was performed, and the tampon was reinserted with sofra-tulle®. Evaluation at 2 weeks postoperatively showed growth of cicatricial tissue surrounding the EAC wall, resulting in stenosis, which was treated with chemical cauterization using 40% Trichloroacetic acid (TCA) and periodic tampons to maintain the lumen of the EAC. The patient was evaluated every week, and in the 4th week, the lumen of the EAC is within normal limits. At the latest follow-up 1-year postoperatively, the patient had no complaints, and EAC was within normal limits (Figure 3).

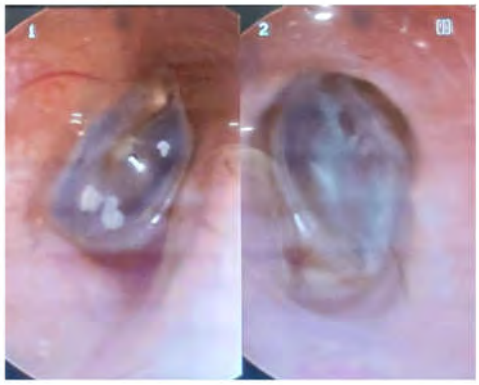

Figure 3 Evaluation of the left and right external auditory canal after 1 year post-granulomectomy

DISCUSSION

Granuloma is a chronic inflammatory reaction involving the macrophage system and other inflammatory cells. Granuloma consists of microscopic aggregations of macrophages that turn into epithelial-like cells surrounded by mononuclear leukocytes, mainly lymphocytes and plasma cells [5]. There is a complex interaction between invading organisms or prolonged antigenemia, macrophage activity, Th1 cell response, B cell overactivity, and a vast array of biological mediators. Granuloma, if left unchecked, will continue to grow. Macrophages engulf foreign body/ material and present some of it to T-lymphocytes, thus activating them. These cells produce cytokines like interleukin (IL)-2 in response. IL-2 activates other T cells, and interferon (IFN)-gamma activates other macrophages, resulting in a continued response. Macrophages will turn into epithelioid cells and merge into multinucleated giant cells [6,7].

Granuloma can be divided into three groups: infectious granuloma, non-infectious granuloma, and foreign body granuloma. Infectious granuloma is characteristically found in tuberculosis and some deep fungal infections. Non-infectious granulomas are found in delayed cell-mediated immune reactions

in hypersensitivity pneumonitis and in diseases of unknown etiology such as sarcoidosis. Foreign body granuloma is granuloma that forms around exogenous indigestible materials such as surgical suture material, splinters of wood, ova of parasites, and so on. They contain numerous giant cells or commonly referred to as multinucleated giant cells [7].

In this case, the patient had no systemic symptoms and only complained of localized symptoms in his ear. The patient did not have a history of systemic diseases such as tuberculosis or autoimmune diseases, so the most probable pathogenesis in this patient is a foreign body granuloma in which a foreign object/material in the patient's ear canal cannot be adequately phagocytosed. If the object is too large, the phagocytes unite to form a foreign-body giant cell to surround and isolate the foreign body. If the object is macroscopic, the giant cells fail, and the inflammatory process becomes persistent, forming a foreign body granuloma in the ear canal [8].

The most common clinical signs in patients with ear canal granuloma are otorrhoea, ear fullness, and hearing loss. Some patients are asymptomatic with small granuloma. If the size of the granuloma is large enough to cover the ear canal, hearing loss can occur, and tuning-fork test shows conductive hearing loss. On physical examination, granulation tissue growth in the ear canal will be found [9,10].

Ear canal granuloma can arise from (a) the external acoustic canal, (b) the middle ear, which then grow through tympanic membrane perforation and cause the appearance of granulation tissue in the ear canal, or (c) from adjacent structures such as the parotid gland and temporomandibular joint (due to secondary invasion by certain diseases). Therefore, it is necessary to carry out supporting examinations such as X-rays of mastoids to ascertain that the mass arises from the ear canal. A correct interpretation of the preoperative radiological features and adequate clinical information will narrow the differential diagnosis [10].

A granulectomy is performed if there is no improvement after conservative treatment or if the granuloma completely covers the external acoustic meatus [10,11]. After the granuloma is removed, it should be submitted for further histopathological examination. Histopathological examination is essential for confirming the diagnosis, finding unusual lesions, and assisting in the patient's subsequent management [11]. Patients with non-specific granuloma, with or without foreign bodies, must be evaluated regularly after granulomectomy because recurrence can occur months or years after treatment [12].

CONCLUSIONS

Ear canal granuloma is a nodular lesion in EAC that can arise from various diseases in the ear or systemic disease. Clinical symptoms of granuloma vary from patient to patient, which may include otorrhoea, ear fullness, and hearing loss. Patients with ear canal granuloma that does not respond to medical therapy require granulomectomy. Before surgery, it is necessary to carry out supporting examinations such as audiogram, X-ray of the mastoids, and/or CT scan of the temporal bone to rule out the possibility of an underlying cholesteatoma or the presence of neoplasms. Although granuloma originates from a benign process, there is still a risk of extension to the facial nerve, and if there is a delay in diagnosis, the neoplastic process has a more significant potential for morbidity.

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