A Case of Mastoid Cholesterol Granuloma with Review of Literature

Author: Kamal-Eldin Ahmed Abou-Elhamd M.D.

Professor in ENT

Al-Ahsa College of Medicine

King Faisal University

Saudi Arabia

Address for correspondence:

Kamal-Eldin A. Abou-Elhamd M.D.

ENT Professor, ENT sector, Department of Surgery

Al-Ahsa College of Medicine

King Faisal University

Al-Ahsa 31982, PO Box 400

Saudi Arabia

Mobile: 00966 508580065 Fax.: 00966 35801243

Email: Kamal375@yahoo.com

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Abstract

Cholesterol granuloma is a pathological lesion affecting the mastoid air cells due to partial obstruction of its aireation. It is commonly unilateral. It is usually associated with glue ear with intact ossicles. Histologically, it is characterized by the presence of large pointed crystals and giant cells. Its treatment is either conservative steroid therapy or surgical removal of the granuloma through simple mastoidectomy.

This is a case report of cholesterol granuloma which was a cause of persistent ear infection in Saudi female patient.

In conclusion, if there is persistence of middle ear infection in spite of proper medical treatment physician should think of mastoid cholesterol granuloma.

Keywords: Cholesterol granuloma; mastoid; ear infection

Introduction

Cholesterol granuloma is a pathological lesion affecting the mastoid air cells due to partial obstruction of its aeration. Transudation (chocolate brown fluid) and cholesterol crystals precipitation induce foreign body reaction with formation of granuloma. Some authors think it is independent disease per se (1). Cholesterol granulomas result from a foreign body reaction to cholesterol crystals. These crystals are believed to be the result of the breakdown of blood or tissue products. Cholesterol granuloma usually affects age group of 10 – 19 years due to Eustachian tube block. It is commonly unilateral (2). It is usually associated with glue ear with intact ossicles. They are most commonly seen in the petrous apex. Although most of cholesterol granuloma is benign in behavior, some of them are highly destructive with aggressive spread (3). Histologically, they are characterized by the presence of large pointed crystals and giant cells. Overtime the granulomas may enlarge, however, they generally remain silent unless they impinge on the cranial nerves. Its treatment is either conservative steroid therapy or surgical removal of the granuloma through simple mastoidectomy.

This is a case of persistent chronic otitis media not responding to medical treatment and on mastoid exploration, a large cholesterol granuloma was found filling the cavity in a Saudi young female.

Case report 1:

J. A., a 19- year old Saudi female presented in August 2005 to the outpatient ENT clinic of Ghassan Najeep Pharoan hospital in Khamis Mushayt, Saudi Arabia with history of recurrent left ear discharge, tinnitus and diminution of hearing. On examination, there was left tympanic membrane central perforation 3X3 mm with mucopurulent discharge and negative Rinne test on the left side. There was no mastoid tenderness. The audiogram showed mild conductive hearing loss of pure tone average of 20 dB. Computerized tomography of the temporal bone showed soft tissue shadow filling the left mastoid air cells with intact ossicles and mastoid boundaries. She was admitted for cortical mastoidectomy and tympanoplasty. On mastoidectomy, the antrum was found filled with granulation tissue and brownish mucoid fluid of high viscosity. The patient postoperatively done well. Rinne test was positive on the operated ear. The removed granulation tissue was sent for histopathological report. The microscopic picture showed granulation tissue with cholesterol clefts with picture of granuloma (figures 1-3). No evidence of malignancy was detected. Diagnosis of cholesterol granuloma was made. Follow up of the patient for one year did not show any inflammations of her left ear.

Discussion

Cholesterol granuloma was first described in 1917 by Manasse. Cholesterol granuloma results from a foreign body reaction to cholesterol crystals. The crystals are precipitated in the mastoid air cells as a sequel of blood stagnation. Cholesterol resists absorption by giant cells. The causes of blood collection are trauma, chronic infection or persistent negative pressure in blocked air cells (4). So, they are uncommon lesions found in the aerated temporal bone. They are rarely found in maxillary (5) and frontal sinuses (6). A report of cholesterol granuloma in antrochoanal polyps was published (7). Cholesterol granulomas were also found outside the head and neck regions. It was reported in the breast, the testes, the lungs, the peritoneum and the kidneys (8). Cholesterol granuloma may also be formed in mucous, pus or necrotic tissue (9). These lesions usually remain clinically silent for long time and they are discovered incidentally during ear surgery (10). The common presentation is either sensorineural hearing loss, tinnitus, vertigo and cranial nerves affection if it is pertous apex lesion or conductive hearing loss and blue drum if it is mastoid lesion. Mastoid cholesterol granuloma may lead to intracranial complications. A case of large extradural collection of fluid due to cholesterol granuloma was reported (11). The best method of investigation is radiological workup. It gives high signal intensity in both T1 and T2 magnetic resonance imaging and does not demonstrate change with gadolinium injection (12). Computerized tomography is essential to localize its bony extension. Cholesterol granuloma is only confirmed by histological examination of the tissue (13). Histopathologically, they are chronic

inflammatory granulation tissue containing large numbers of rhomboid clefts of cholesterol crystals surrounded by foreign body giant cells (14). Leukocytes, active histiocytes and plasma cells are present in large percentage. Fibrin deposition, focal bleeding and hemosiderin are often histological features. Electron microscopic findings include cholesterol needles in the giant cells surrounded by mitochondria and lysosomes. The cholesterol needles are also found in the pools of blood corpuscles (4). Treatment of cholesterol granuloma is either conservative or surgical. Steroid therapy for mild cases is enough in most of cases. Surgical intervention depends on the site of cholesterol granuloma.. Simple mastoidectomy and ventilation tube application is the most surgical approach in mastoid cholesterol granuloma. Endoscopic transsphenoidal removal or lateral skull approach is surgical solution for petrous apex cholesterol granuloma (14). Complete removal is advised to avoid recurrence after surgery.

In our case, she presented for long period with medical treatment for chronic otitis media without success to control her aural discharge in central perforated ear. In these cases, suspicious of causes of chronicity should be borne in mind. These are middle ear sarcoidosis, tuberculosis, autoimmune diseases, Wegener's granulomatosis and middle ear infection in diabetic patients (15). We should add another category cholesterol granuloma of the mastoid as in our case. Investigations should include erythrocyte sedimentation rate, ANCA test, serum calcium, blood sugar, rheumatoid factor, CT and MRI of the temporal bone. If all investigations are normal and granulation tissue was found in the mastoid a biopsy should be sent for histopathological examination to exclude Wegener's granulomatosis which is a fatal disease if not properly treated. This is because

both Wegener's granulomatosis and cholesterol granuloma are associated with otitis media with effusion.

In conclusion, if there is persistence of middle ear infection in spite of proper medical treatment physician should think of mastoid cholesterol granuloma.

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Figures

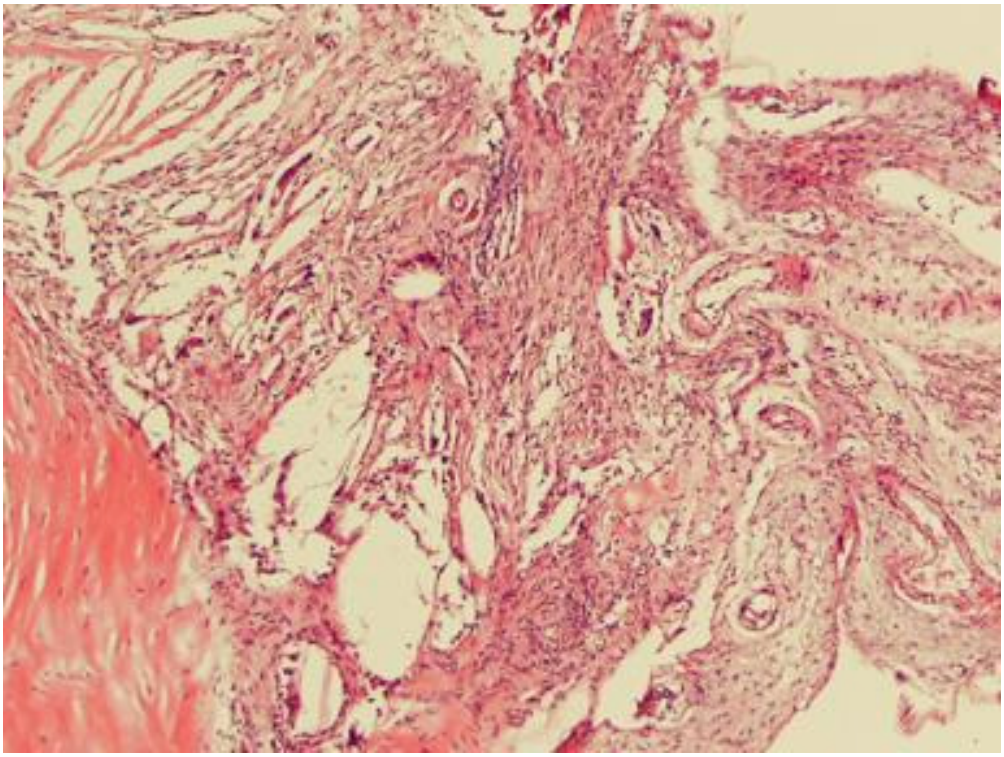

Figure 1: Histology Slide shows granulation tissue with clefts of cholesterol crystals and chronic inflammatory cells and pools of blood.

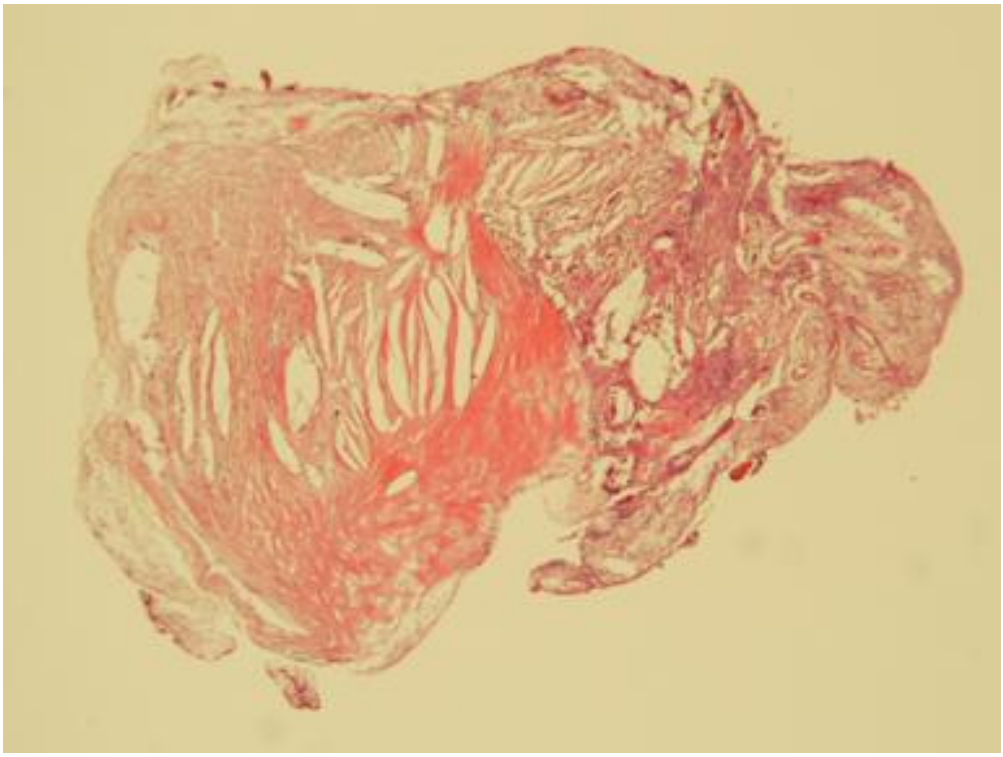

Figure 2: Histology slide shows clefts of cholesterol crystals and pools of blood and chronic inflammatory tissue.

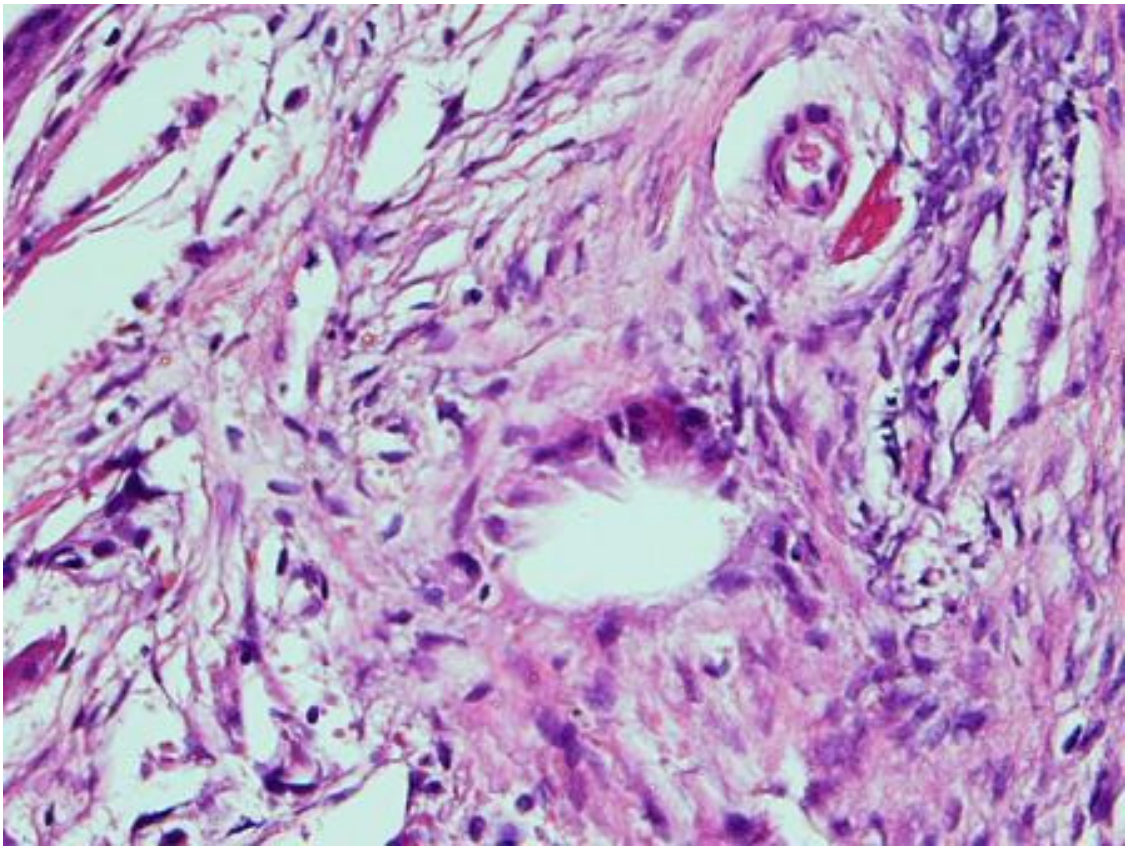

Figure 3: Cholesterol granuloma: granulation tissue contains multinucleated giant cells and rhomboids of cholesterol crystals in the cells.