Leukemia affecting the External and Middle Ear

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A case of leukemia with aural complications, involving the middle and external ear, is reported.

Druss (1945) in an analysis of 148 cases of leukemia, found that aural complications occurred in 25 cases i.e., 16.8 per cent. Yet an Otolaryngologist does not come across such cases as these are not referred to him by the physician, or in case he happens to see the case first because of aural symptoms, he may miss the diagnosis of leukemia as the presenting picture may be typical of the acute inflammation of the ear. A case of leukemia, who happened to present herself first in the E.N.T. Department is reported.

Case Report

A 12 year old female was admitted in JIPMER Hospital, Pondicherry on 24th February, 1971 with the complaint of discharge from the right ear of 3 months duration. She had developed pain in the right ear and inability to close the right eye a week prior to the admission. She had also developed pain and discharge in the left ear 4 days prior to the admission. She was afebrile at the time of admission. Examination revealed the presence of debris in the right ear. There was oedema and swelling of the wall of the right external auditory meatus especially in the postero-superior part with mastoid tenderness. The right tympanic membrane could not be visualised. The left external auditory meatus was clear, but the left tympanic membrane was bulging with mastoid tenderness. There was lower motor neurone type of facial paresis (Fig. 1) on the right side. There were no vesicular symptoms or signs. The cervical lymph nodes and axillary lymph nodes on the left side, were enlarged. The liver was just palpable and the spleen was not palpable. There were no oral or skin lesions. Clinically, a diagnosis of chronic suppurative otitis media of the right side with acute exacerbation, acute mastoiditis, right facial paresis and acute otitis media of the left side with acute mastoiditis was made. The patient was put on crystalline penicillin 1 million units 6 hourly intramuscularly but did not show any improvement. The X-ray of the mastoids did not reveal any significant abnormality. A swab from the right ear showed the presence of Ps. aeruginosa sensitive to streptomycin only and the patient was put on streptomycin. The Haemoglobin was 7.5 g/dl, and the Blood counts were not done due to an oversight. A left myringotomy did not bring out any fluid. The swelling of the deep part of the right external meatus started increasing causing complete stenosis. A right preauricular swelling appeared and the tenderness increased markedly. The temperature started rising to 102°F or 103°F and in spite of the fact that the radiological examination of the mastoids (Fig. 2) was not consistent with mastoid pathology. The right mastoid was explored on 11-3-71. The mastoid appeared somewhat bluish, very cellular, and turbid fluid under tension was present. The whole mastoid and the middle ear were full of granulations which were rather pale. The tympanic membrane had been destroyed by the disease. The posterior meatal wall skin was inflamed and swollen resulting in marked stenosis of the external auditory canal near the tympanic membrane. The granulations appeared to be penetrating into the region of the facial nerve over its horizontal part.

Fig. 1. Clinical photograph of the patient showing right facial paresis and bony swelling of the left temporal region.

Fig. 2. X-ray of the right mastoid showing clear cellular mastoid.

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During the immediate post-operative period the patient appeared to be becoming more anaemic and the blood examination done on 19-3-71 revealed the following:

- **Haemoglobin**: 4.0 G%
- **RBC**: 2.0 million/cmm.
- **ESR** (Westergren): 80 mm/hour
- **PCV**: 16%
- **Total leucocyte count**: 6,000/cm.m
- **Differential count**:
  - Myeloblasts: 46%
  - Neutrophils: 7%
  - Lymphocytes: 45%
  - Monocytes: 2%
  - Normoblasts: 1/100
- **MCV**: 89 cubic microns
- **MCH**: 20 micromicrogramme
- **MCHC**: 22%

There was marked normocytic hypochromic anaemia showing minimal anisocytosis and an occasional macrocyte or a normoblast. The leucocytes showed a large number of myeloblasts (46%) and the platelets appeared considerably diminished. The picture was that of acute subleukemic myeloblastic leukemia.

Other serum levels were as follows:

- **Serum alkaline phosphatase**: 15 K.A. Units
- **Serum Uric Acid**: 3.1 mgm %

The bone marrow examination done on 23-3-71, was reported as follows (Fig. 3):

- A hypercellular marrow showing depressed normoblastic erythropoiesis. There is marked hyperplasia of myeloid cells with a large number of myeloblasts. Megakaryocytes appeared to be diminished (Erythroid-Myeloid ratio 1:15). No parasite is seen. The picture is that of acute myeloblastic leukemia.

A bone-marrow examination repeated after a week showed the same picture.

- The histopathological examination of the granulations and the mastoid bone showed infiltration by myeloid series of cells, mostly monomorphic in type (Fig. 4). The picture was consistent with leukemic infiltration.

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The fundus examination revealed superficial retinal hemorrhages on both sides. An audiometric examination done on 1-4-71 indicated mixed deafness on both the sides.

The follow up of the case for about a month showed that the left ear inflammation was progressing, this was probably a leukemic infiltration as it did not regress with antibiotics. Further leukemic deposits were indicated by presence of a swelling in the left temporal region and proptosis of the right eye (Fig. 5).

The histopathological examination of the granulations and the mastoid bone showed infiltration by myeloid series of cells, mostly monomorphic in type (Fig. 4). The picture was consistent with leukemic infiltration.

A section of the skin showed leukemic infiltration in the dermis. A section of the bony chips showed hypercellular marrow with identical cellular infiltration.

Thus a diagnosis of acute subleukemic myeloblastic leukemia involving the right external and middle ear including the mastoid and the facial nerve was made and the patient was put on anti-leukemic treatment.

About a week after the mastoid operation, the patient developed a painless bony swelling in the opposite temporal region which was seen progressively increasing in size. This was thought to be due to a leukemic deposit. An X-ray of the skull did not show any change. The radiological examination of the long bones did not reveal any lesion.

The Fundus examination revealed superficial retinal hemorrhages on both sides.

**Discussion**

This patient presented with typical manifestations of acute suppurative pathology involving the middle ear cleft complicated by facial paresis. Under the cover of antibiotics the pathological process seemed to be progressing and involved the external ear as well. The radiological examination of the mastoids showed that the bones were not involved. The exploration of the mastoid was very rewarding as extensive pathology was seen in the mastoid. The diagnosis of leukemia was suspected on examining the blood film after the operation. The bone-marrow examination confirmed the nature of the primary disease and the histopathological examination of the mastoid lesion confirmed the presence of leukemic deposits in the