Pokharel A
Paudel D

Department of Otorhinolaryngology - Head and Neck Surgery,
B.P. Koirala Institute of Health Sciences, Dharan, Nepal

Correspondence:
Dr. Apar Pokharel
Department of Otorhinolaryngology-Head and Neck Surgery, B.P.Koirala Institute of Health Sciences, Dharan, Nepal.

Email: aparpokharel@hotmail.com

PERICHONDRITIS OF PINNA: ANALYSIS OF 49 CASES AT A TERTIARY CARE CENTER IN EASTERN NEPAL

Objectives:
To analyse the aetiological factors responsible for perichondritis of pinna and to see the role of antibiotic and surgical treatment in the outcome of disease

Materials and Methods:
A prospective study involving 49 patients who were admitted with perichondritis of pinna during June 2012 to June 2014. Analysis of their demographic details, medical history, current illness, etiology, pathogens and treatments was carried out.

Results:
The patients mean age was 21 years. In 9 patients (18.36%), the etiology could not be determined. Pseudomonas aeruginosa was found to be the predominant organism (62.06 %) and was associated with a more advanced clinical presentation and longer hospitalization. 29 patients (59.18 %) required surgical intervention.

Conclusion:
Perichondritis of pinna can develop after apparent minor trauma. Since Pseudomonas aeruginosa is probably the predominant pathogen, initial treatment should include anti-pseudomonal antibiotics.

Key Words: Perichondritis, Pseudomonas aeruginosa

INTRODUCTION:

Perichondritis of pinna is a serious complication of the traumatized ear that can lead to residual deformity.[1] Two types of inflammatory conditions are seen in the auricular cartilage: suppurative perichondritis and relapsing polychondritis. Relapsing polychondritis is a rare disease, with an autoimmune cause, featured by an episodic and progressive course that involves the cartilaginous tissue of the nose, ears and the laryngo- tracheo-bronchial tree.[2]

Blunt injury with haematoma and infection acts as the most common cause of perichondritis,[3] although penetrating injuries such as ear-piercing [4] and acupuncture [5] can also introduce infection directly. Suppurative perichondritis has also been seen following mastoid surgery [6] and as a complication of a burns injury. In uncomplicated cases, only a limited portion of the cartilage is usually involved, where as in serious cases the cartilage damage is more generalised.[1]

The infection usually starts as a dull pain accompanied by redness, warmth and swelling. It usually starts from the helix and anti-helix but may involve the whole cartilage if treatment is withheld.[1] The most common microbiological agent implicated is thought to be Pseudomonas aeruginosa,[1] which seems to have a special affinity for the damaged cartilage.[7,8] The other organisms commonly seen are Proteus species,[6] Staphylococcus aureus[1] and Escherichia coli.[9] P. aeruginosa is often found in the external auditory canal, particularly under moist conditions. Traumatic injury introduce this pathogen into the cartilaginous layer and the underlying soft tissue culminating in perichondritis.[10]

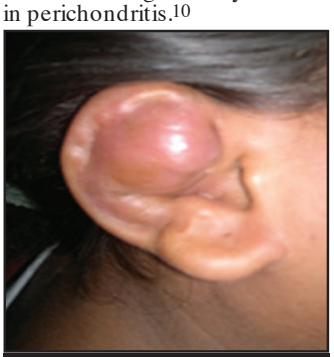

Fig. 1 showing subperichondrial abscess secondary to piercing of pinna

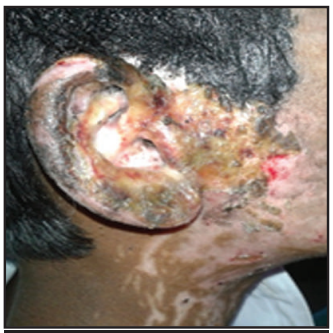

Fig. 2 showing perichondritis due to burn injury

The aim of this present study was to analyse the aetiological factors responsible for the disease and to see the role of antibiotic and surgical treatment in the outcome of disease.

MATERIALS AND METHODS:

This prospective study of patients presenting with perichondritis to the Department of Otolaryngology - Head and Neck surgery at B.P.Koirala Institute of Health Sciences was conducted over a two-year period from June 2012-June 2014. Patients were classified based on the severity of the disease. Stage one involves patients with early perichondritis without fluctuant abscess; stage two involves patients with perichondritis with fluctuant abscess but no cartilage destruction; and stage three involves patients with perichondritis with fluctuant abscess and cartilage destruction. Factors like demographic details, medical history (diabetes mellitus, recurrent otitis), recent medical history related to current illness (any recent surgical intervention on the ear), possible predisposing event (e.g., trauma, acupuncture) were also taken into consideration.

In case of early disease the patients were treated with intravenous antibiotics alone. Ciprofloxacin was initially given in all cases. Antibiotics were subsequently changed depending on the bacterial culture and sensitivity reports obtained. If there was a clinical suggestion of abscess formation incision and drainage was performed. In all cases, this was performed under local anaesthesia with aseptic precautions. After making the incision, a swab was taken for culture and sensitivity. The cartilage was then inspected and, if found to be normal, a pressure bandage was applied. In cases of persistent fluctuance in the same area, or appearance of fluctuance in any other area, the procedure was repeated. In cases of cartilage necrosis, the necrosed cartilage was removed and a window was created. The margins of the remaining cartilage was freshened and the skin flap repositioned. A firm pressure bandage was applied in all cases.

RESULTS:

Altogether 49 patients were included in the study. The mean age of the patients was 21 years (median age 18 , range 8-65years) and 34 (69.38%) were females. 6 patients (12.24%) had diabetes mellitus. The most common aetiological factor observed was trauma, which was present in 24 cases (48.97%), 4 cases (8.16%) after mastoid surgery, 3 cases (6.12%) were secondary to chronic aural discharge, and 3 cases (6.12%) were due to a burn. In 9 cases (18.36%), no significant cause could be determined. The results are depicted in Table I.

Table 1. Showing aetiological factor of perichondritis.

Aetiology	Cases	Percentage
Post-traumatic	24	48.97
Post- operative	4	8.16
Post- infective	3	6.12
Burns	3	6.12
Furunculosis	2	4.08
Herpes Zoster	2	4.08
Insect Bite	1	2.04
Allergy	1	2.04
Unknown	9	18.36

20 patients (40.81%) fell into stage one , 20 patients (40.81%) fell into stage two and 9 patients (18.36%) fell into stage three. Fever (≥38°C) and lymphadenopathy were each found in 24 patients (48.97%). Although the white blood cell count and ESR levels in the stage three group were higher, they were not significantly different (WBC 9.6 x 10^3 vs. 9.8 x 10^3 vs. 10.1x10^3 cell/mm3 for stage 1, Stage 2 and stage 3 group respectively; average ESR 36.4 vs. 37.2 vs. 39.4 mm/hr for stage1, stage 2 and stage 3 group respectively). P. aeruginosa was found to be the predominant organism (n= 18, 62.06% of isolates) followed by staphylococcus aureus (n=4, 13.79%). The distribution of causative pathogens is depicted in Table 2. Infections caused by P. aeruginosa were associated with a more advanced clinical presentation and involved a lengthier hospitalization (Table 3). 8(44.44%) isolates of P. aeruginosa showed resistance to at least one antibiotic, while 4 (22.22%) were found to be resistant to three or more drugs. 6 (33.33%) isolates were sensitive to all anti-pseudomonals tested. Drugs like Amikacin, Carbenicillin, Ceftazidime, Pipracillin, Tobramycin, Ciprofloxacin and Meropenem were used to test antibiotic sensitivity.

Table 2. Distribution of pathogens.

Pathogen Isolates	Number	Percentage
Pseudomonas aeruginosa	18	62.06
Staphylococcus aureus	4	13.79
Escherichia coli	3	10.34
Klebsiella pneumoniae	2	6.89
Acinetobacter species	2	6.89

The hospital stay was significantly longer in Stage 3 group (14 days vs.7days vs. 3 days). 29 patients (59.18%) needed surgical intervention, 20 patients needed incision and drainage and 9 patients required debridement of soft tissue and excision of necrotic cartilage. All patients in this study were treated with intravenous antibiotics. Patients with Pseudomonas infections demonstrated longer hospitalization time than those with non-Pseudomonas infections (mean 7.2±2.8 vs. 5.9±2.1 days respectively).

Table 3. Clinical features of perichondritis caused by P. aeruginosa vs. other organisms

	Pseudomonas (n=18)	Non-Pseudomonas (n=11)
Diabetes mellitus	4	2
Post-surgical	1	3
Post-infective (Chronic Ear Discharge)	1	2
Stage 1	No culture	No culture
Stage 2	9	11
Stage 3	9	0
Fever	15	9
White Blood Cells Count (*103/mm3)	10.1±2.4	9.4±2.7P value 0.47. Insignificant
Maximum ESR (mm/hr)	38.6±10	36.4±12P value 0.59. Insignificant
Required surgery	18	11
Number of days of hospital stay	7.2±2.8	5.9±2.1P value 0.19. Insignicant

ESR = erythrocyte sedimentation rate

DISCUSSION:

Perichondritis of the auricle can lead to external ear deformity, and it is a difficult condition to treat. Like other previous studies, in our study the main aetiological causes for this disease were found to be traumatic, iatrogenic (postoperative),[6,7,11] burns,[1,12] ear-piercing[4], allergy and insect bite. In 8 cases, infection developed on a background of middle-ear and external ear infections, the latter varying from otitis externa to diffuse lesions following herpes zoster and infection in diabetic patients. This shows that cartilage damage is not necessary prerequisite condition for perichondritis; the cartilage can clearly become infected if the overlying infected meatal skin is subjected to only minimal trauma, such as follows instrumentation or scratching with an infected fingernail. In a significant percentage of cases, no significant cause could be determined.

Although many surgical modalities have been described in the past, all authors have agreed that parenteral antibiotics are of paramount importance in the treatment of this condition. Analysis of pus in 29 patients with perichondritis showed that Pseudomonas aeruginosa was present in the majority of cases (62.06 %). However, the antibiotic sensitivity of this organism did vary, and this highlights the need to obtain a swab in all cases. Patients with positive ear cultures for P. aeruginosa presented with a more severe disease. These patients had a longer hospital stay. In light of these findings, it is justifiable to recommend empiric treatment with anti-pseudomonal antimicrobials for outpatients as well as for hospitalized patients. A prospective study could answer the question whether initial treatment in the community with antipseudomonal antibiotics (e.g., fluoroquinolone) could minimize the number of hospitalizations and significantly raise the success rates of outpatient treatment of perichondritis.

CONCLUSION:

Perichondritis develops in many cases after apparent minor trauma. Since P. aeruginosa is probably the predominant pathogen, initial treatment should include anti-pseudomonal antibiotics.

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