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CLINICAL RECORD

Piercing associated perichondritis of the pinna: are we treating it correctly?

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Abstract

Objective: This paper reports a series of patients with sporadic pinna perichondritis who presented to a district general hospital over a period of 10 years. The data examined included the causative organism, risk factors and pattern of antibiotic use.

Method: A retrospective analysis of diagnosed cases of pinna perichondritis from 2001 to 2012 was performed. A literature review of pinna perichondritis was carried out using Pubmed with the key words 'pinna perichondritis', 'pinna abscess', 'pinna infection' and 'piercing'.

Results: Pinna perichondritis was more likely to result from chondral than lobe piercings. The majority of cases were caused by *Pseudomonas aeruginosa*.

Conclusion: Most patients were not prescribed anti-pseudomonal antibiotics on presentation. This may result in persistent infection and long-term cosmetic defects.

Key words: Auricular Cartilage; Ear Piercing; Pseudomonas Aeruginosa; Treatment

Introduction

Pinna perichondritis can arise as a rare complication secondary to ear piercing. An increase in incidence in recent years is associated with the rising popularity of chondral piercings,[1] which cause stripping of the perichondrium and microfractures of the cartilage.[2] This potentially deforming condition affects a young age group that is likely to be sensitive to cosmetic outcome.

We systematically examined cases of patients with sporadic pinna perichondritis associated with piercing who presented to a district general hospital over 10 years. The study focused on causative organisms, antibiotic use and cosmesis. A literature review of pinna perichondritis associated with piercing was undertaken.

Case reports

Case one

An 11-year-old girl presented to our department with a 4-day history of a painful, swollen cartilage piercing. She reported no significant co-morbidities. She had been prescribed flucloxacillin by her general practitioner, which she had taken for 48 hours prior to presentation. The pus swab grew *Pseudomonas aeruginosa*. She was initially started on intravenous co-amoxiclav and flucloxacillin by the on-call ENT team; however, this was changed to oral ciprofloxacin on the basis of the culture results. Following incision and drainage, and the administration of antibiotics, the abscess resolved without residual deformity.

Case two

A 16-year-old girl presented to our department with an ear cartilage piercing which had become infected 2 weeks previously after she accidentally pulled on the earring. She had been prescribed a course of clarithromycin by her general practitioner (flucloxacillin was avoided due to a penicillin allergy), but this failed to relieve the symptoms. On examination, a fluctuant abscess was present over the site of the piercing. Incision and drainage of the abscess was carried out. Culture of pus showed *P aeruginosa*. She was prescribed a 7-day course of ciprofloxacin. There was no cosmetic deformity of the pinna at follow up.

Materials and methods

We undertook a retrospective review of local patient notes dating from 2001 to 2012 using the World Health Organization International Classification of Diseases version 10 code H60.0 (abscess of the external ear). Cases with no history of associated piercing were excluded. The diagnoses of excluded cases included sebaceous cyst, infected pre-auricular sinus and spontaneous pinna perichondritis. The data extracted from the notes included patient age at presentation, gender, site of piercing, duration of symptoms, co-morbidities, first-line and second-line antibiotic treatment, incision and drainage, duration of antibiotic use, and cosmetic outcome at follow up (Table I).

A literature search was carried out using Pubmed with the key words 'pinna perichondritis', 'pinna abscess', 'pinna infection' and 'piercing'. Sixteen studies reporting pinna perichondritis secondary to piercings were identified, all of

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TABLE I
CASE SERIES SUMMARY*

Pt sex, age (y)	Symptom dur (days)	Site of piercing	Trauma	Pre-admission antibiotics	Micro-organism	In-patient antibiotics	Co-morbidities	Cosmetic outcome
F, 16	13	L high chondral	Y	Clarithromycin	Pseudomonas	Ciprofloxacin	N	Satisfactory
F, 14	14	L high antihelix	N	Flucloxacillin, co-amoxiclav	Pseudomonas/mixed skin flora	Ciprofloxacin	N	Pinna deformity
M, 17	28	R high chondral	N	Flucloxacillin, penicillin	Pseudomonas	BenPen/flucloxacillin, metronidazole	Mild asthma	Pinna deformity
F, 17	9	L high chondral	N	Amoxicillin	Pseudomonas	Ciprofloxacin	Eczema	Satisfactory
M, 5	7	L ear lobe	N	Flucloxacillin	Not available	Flucloxacillin, co-amoxiclav	None	Satisfactory
F, 22	2	L low chondral	Y	Co-amoxiclav	Pseudomonas	Gentamicin, ciprofloxacin	None	Satisfactory
F, 13	14	L high chondral	N	Flucloxacillin	Pseudomonas	Cephalexin, metronidazole	Dermato-fibromata	Satisfactory
F, 11	4	L high chondral	N	Flucloxacillin	Pseudomonas	Augmentin/flucloxacillin (IV), then ciprofloxacin	N	Satisfactory
F, 18	5	R high chondral	N	Flucloxacillin	Pseudomonas	Cefuroxime & metronidazole (IV), then ciprofloxacin	Asthma	Satisfactory
M, 34	21	L high chondral	N	Co-amoxiclav	None isolated	Tazocin (IV), then ciprofloxacin	N	Satisfactory

*Patients with sporadic pinna perichondritis associated with piercing who presented to Colchester General Hospital between 2001 and 2012. Pt = patients; y = years; dur = duration; F = female; L = left; Y = yes; N = no; M = male; R = right; BenPen = benzylpenicillin sodium; IV = intravenous

TABLE II
LITERATURE REVIEW SUMMARY*

Study	Year	Country	Cases (*n*)	Micro-organism (% PA)	First-line treatment	Second-line treatment	Cosmetic outcome
Hanif *et al.*[1]	2001	UK	3	Not reported	Ciprofloxacin	Not reported	66% chondral deformity
Rowshan *et al.*[3]	2008	USA	1	100	Cephalexin	Ciprofloxacin	No deformity
Fernandez *et al.*[4]	2008	Brazil	1	100	Aztreonam, oxacillin	None	No deformity
Sandhu *et al.*[5]	2007	Canada	1	100	Cephalexin	Cloxacillin, clindamycin, ceftazidime	No deformity
Pena *et al.*[6]	2006	Brazil	1	100	Cephalexin, prednisolone	Ciprofloxacin	Chondral deformity
Yahalom & Eliashar[7]	2003	Israel	1	Not reported	Ciprofloxacin	None	No deformity
Kent *et al.*[8]	2001	UK	10	60	Flucloxacillin, erythromycin	Not reported	Not reported
Staley *et al.*[9]	1997	USA	2	100	Cephalexin, cefadroxil	Ceftazidime, tobramycin	100% chondral deformity
Manca *et al.*[10]	2006	Canada	1	100	Cephalexin	Levofloxacin, ciprofloxacin	No deformity
Vargas *et al.*[11]	2005	Venezuela	1	100	Ampicillin, cefadroxil	Cefoperazone, sulbactam	No deformity

*Case reports of sporadic pinna abscess secondary to piercing (1997–2008). PA = *Pseudomonas aeruginosa*

which were case reports or case series.[1,3–17] A total of 32 cases were reported. Six studies were excluded from the analysis: one article was in Dutch and one was in Danish, and the other four were available in abstract form only (Table II).[12–17] In addition, two studies reported outbreaks of pinna perichondritis with an identifiable source of *Pseudomonas aeruginosa*.[18,19]

Results and discussion

Ten cases of sporadic pinna perichondritis associated with piercing were identified during the 10-year period (from 2001 to 2012). Ninety per cent of these involved piercings through the chondral cartilage. The duration of symptoms ranged from 2 to 28 days. Trauma to the ear was reported in two cases. No predisposing factors were identified in the other cases. Asthma was reported as a co-morbidity by two of the patients, although none of the patients were on systemic steroid therapy. For 8 of the 10 patients, pus swabs grew *P aeruginosa*. In the remaining two cases, no organisms were isolated. Prior to admission, all 10 patients had been prescribed an antibiotic that did not have anti-pseudomonal activity. The most common pre-admission antibiotics prescribed were flucloxacillin (60 per cent) and co-amoxiclav (20 per cent). Patients were started on an anti-pseudomonal antibiotic by the first on-call ENT clinician in only 50 per cent of cases. At follow up, 20 per cent of patients were reported to have suffered permanent cosmetic deformity of the pinna.

Our literature review identified 16 studies reporting 32 cases of sporadic pinna perichondritis secondary to piercing.[1,3–17] The most common causative organism detected was *P aeruginosa*.[3–6,8–11] Cephalexin was the most frequently administered (in-patient) first-line treatment worldwide,[3,5,6,9,10] with ciprofloxacin a common second-line agent.[3,6,10] The review revealed that perichondritis can occur after recent piercings or spontaneously in old piercings. A significant number of cases resulted in chondral deformity or 'cauliflower ear'.[1,6,9] Outbreaks of *P aeruginosa* associated perichondritis were also described.[18,19] Risk factors associated with infection included location of piercing (upper cartilage piercings carried a higher risk than lobule piercings) and use of contaminated disinfectant solution.

Ciprofloxacin is the oral antibiotic of choice for treating pinna perichondritis secondary to piercing. Ciprofloxacin has anti-pseudomonal as well as anti-staphylococcal activity, and shows excellent tissue penetration. However, its use has been restricted in paediatric populations due to the risk of arthropathy seen in animal models. In our case series, 70 per cent of patients were under 18 years of age. It is therefore important to consider the safety of oral ciprofloxacin in comparison with other intravenous anti-pseudomonal antibiotics. A recent meta-analysis of 16 184 paediatric patients given systemic ciprofloxacin suggested that the risk of musculoskeletal adverse events attributed to ciprofloxacin use was 1.6 per cent, with arthralgia representing 50 per cent of reported adverse events.[20] Almost all of the reported events resolved with discontinuation of the drug. No study was able to identify any significant growth disturbance secondary to ciprofloxacin use. Therefore, a short course of ciprofloxacin in a paediatric population is likely to be safe in the context of appropriate monitoring and follow up.

- **Chondral piercings of the pinna have become increasingly popular**
- **Compared with lobe piercings, these carry greater risk of pinna perichondritis or abscess formation**
- ***Pseudomonas aeruginosa* accounts for the majority of cases presenting to secondary care**
- **An antibiotic with activity against both pseudomonas and staphylococcus is recommended as a first-line agent**
- **A short course of ciprofloxacin is safe and effective in a paediatric population**

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Our study confirms that *P aeruginosa* is the predominant causative organism in pinna perichondritis associated with piercings in patients presenting to secondary care. Therefore, prescribing antibiotics with activity against staphylococcus only is likely to lead to persistent infection and risk of cosmetic deformity. Currently, medical practitioners including ENT specialists do not routinely prescribe anti-pseudomonal antibiotics as a first-line treatment for these cases. Patients presenting to secondary care physicians are likely to have been prescribed antibiotics prior to admission. From the limited data available, it is not possible to determine whether *P aeruginosa* has a preferential ability to infect cartilage piercings, or whether the cases seen in secondary care are distinguished based on prior antibiotic use. An epidemiological study would be valuable in order to determine the micro-organisms responsible for pinna perichondritis in primary care, and would inform whether the recommendations in this study can be extended to the treatment of these cases in a community setting.

References

1 Hanif J, Frosh A, Marnane C, Ghufoor K, Rivron R, Sandhu G. Lesson of the week: "high" ear piercing and the rising incidence of perichondritis of the pinna. *BMJ* 2001;**322**:906–7
2 van Wijk MP, Kummer JA, Kon M. Ear piercing techniques and their effect on cartilage, a histologic study. *J Plast Reconstr Aesthet Surg* 2008;**61**(suppl 1):S104–9
3 Rowshan HH, Keith K, Baur D, Skidmore P. Pseudomonas aeruginosa infection of the auricular cartilage caused by "high ear piercing": a case report and review of the literature. *J Oral Maxillofac Surg* 2008;**66**:543–6
4 Fernandez AP, Castro Neto I, Anias CR, Pinto PC, Castro Jde C, Carpes AF. Post-piercing perichondritis. *Braz J Otorhinolaryngol* 2008;**74**:933–7
5 Sandhu A, Gross M, Wylie J, Van Caeseele P, Plourde P. Pseudomonas aeruginosa necrotizing chondritis complicating high helical ear piercing case report: clinical and public health perspectives. *Can J Public Health* 2007;**98**:74–7
6 Pena FM, Sueth DM, Tinoco MI, Machado JF, Tinoco LE. Auricular perichondritis by piercing complicated with pseudomonas infection. *Braz J Otorhinolaryngol* 2006;**72**:717
7 Yahalom S, Eliashar R. Perichondritis: a complication of piercing auricular cartilage. *Postgrad Med J* 2003;**79**:29
8 Kent SE, Rokade AV, Premraj K, Butcher C. "High" ear piercing and perichondritis of the pinna. *BMJ* 2001;**323**:400
9 Staley R, Fitzgibbon JJ, Anderson C. Auricular infections caused by high ear piercing in adolescents. *Pediatrics* 1997; **99**:610–11
10 Manca DP, Levy M, Tariq K. Case report: infected ear cartilage piercing. *Can Fam Physician* 2006;**52**:974–5
11 Vargas J, Carballo M, Hernández M, Rojas N, Jiménez O, Riera J *et al*. Rapid development of auricular infection due to imipenem-resistant Pseudomonas aeruginosa following self-administered piercing of high ear. *Clin Infect Dis* 2005;**41**:1823–4
12 Janssen K, Kon M. Three patients with complications following piercing of the auricular cartilage [in Dutch]. *Ned Tijdschr Geneeskd* 2004;**148**:1351–4
13 Eckhardt LR, Haug S, Nielsen KO. Perichondritis caused by high ear piercing. Therapeutic and legal aspects [in Danish]. *Ugeskr Laeger* 2002;**164**:5144–5
14 Cumberworth VL, Hogarth TB. Hazards of ear-piercing procedures which traverse cartilage: a report of Pseudomonas perichondritis and review of other complications. *Br J Clin Pract* 1990;**44**:512–13
15 Turkeltaub SH, Habal MB. Acute Pseudomonas chondritis as a sequel to ear piercing. *Ann Plast Surg* 1990;**24**:279–82
16 Widick MH, Coleman J. Perichondrial abscess resulting from a high ear-piercing–case report. *Otolaryngol Head Neck Surg* 1992;**107**:803–4
17 Folz BJ, Lippert BM, Kuelkens C, Werner JA. Hazards of piercing and facial body art: a report of three patients and literature review. *Ann Plast Surg* 2000;**45**:374–81
18 Keene WE, Markum AC, Samadpour M. Outbreak of Pseudomonas aeruginosa infections caused by commercial piercing of upper ear cartilage. *JAMA* 2004;**291**:981–5
19 Fisher CG, Kacica MA, Bennett NM. Risk factors for cartilage infections of the ear. *Am J Prev Med* 2005;**29**:204–9
20 Adefurin A, Sammons H, Jacqz-Aigrain E, Choonara I. Ciprofloxacin safety in paediatrics: a systematic review. *Arch Dis Child* 2011;**96**:874–80

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