PEDIATRICS®

**Auricular Infections Caused by High Ear Piercing in Adolescents**

Ronna Staley, James J. Fitzgibbon and Catherine Anderson

*Pediatrics* 1997;99;610-
DOI: 10.1542/peds.99.4.610

**This information is current as of June 28, 2005**

The online version of this article, along with updated information and services, is located on the World Wide Web at:
http://www.pediatrics.org/cgi/content/full/99/4/610

PEDIATRICS is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since 1948. PEDIATRICS is owned, published, and trademarked by the American Academy of Pediatrics, 141 Northwest Point Boulevard, Elk Grove Village, Illinois, 60007. Copyright © 1997 by the American Academy of Pediatrics. All rights reserved. Print ISSN: 0031-4005. Online ISSN: 1098-4275.

American Academy of Pediatrics
DEDICATED TO THE HEALTH OF ALL CHILDREN™

Downloaded from www.pediatrics.org by on June 28, 2005

fluorescence microscope.[3] The sensitivity of DFA is greatest for vesicular lesions and decreases as lesions progress to pustules and scabs.[8] DFA has been shown to have good sensitivity and specificity for diagnosing HSV[11] and VZV[3] and, in fact, is more sensitive than culture for detecting VZV.[3,8] Coffin and Hodinka[3] report a sensitivity of 49% with a negative predictive value of 60% for viral culture of VZV and a sensitivity of 97.5% and a negative predictive value of 97% for DFA identification of VZV.[3]

Our patient had vesicle content sent for both viral culture and DFA testing. DFA results were available within 24 hours, compared with the viral culture, which was positive after 26 days. Had the child not had a rapid diagnostic test performed, an investigation for possible sexual abuse could have continued for 1 month before the true infectious cause of her rash was known. Although all physicians have a responsibility to report cases of suspected child sexual abuse, a cautious approach should be taken when the suspicion is based on the presumptive diagnosis of a sexually transmitted disease. This is especially true for children who offer no histories of sexual abuse and whose parents have no concern about the possibility of abuse. Diagnoses of the majority of sexually abused children are made from their histories of abuse; only a small minority present with sexually transmitted diseases.[13] Although many sexually abused children with sexually transmitted diseases offer no histories of abuse at the time of their initial evaluation,[5,14] a lack of history cannot exclude the possibility of abuse. However, misidentification of sexually transmitted diseases in children can occur,[15] which may result in unnecessary legal action as well as emotional trauma for the child and family. The possibility of sexual abuse must be considered anytime a child is found to have isolated anogenital vesicles. It is the responsibility of the primary care physician to question both the parents and child about possible sexual abuse. If there is no such history provided, and the question of sexual abuse is raised only by the presumptive diagnosis of a sexually transmitted infection, we recommend that a definitive diagnosis be secured before subjecting the child and family to a child abuse investigation.

Cindy W. Christian, MD
University of Pennsylvania School of Medicine
Division of General Pediatrics
Children's Hospital of Philadelphia
Philadelphia, PA 19104

Michele L. Singer, BA
University of Pennsylvania School of Medicine
Philadelphia, PA 19104

James E. Crawford, MD
Division of General Pediatrics
Children's Hospital of Philadelphia
Philadelphia, PA 19104

Dennis Durbin, MD
University of Pennsylvania School of Medicine
Division of Emergency Medicine
Children's Hospital of Philadelphia
Philadelphia, PA 19104

## REFERENCES

1. Simon HK, Steele DW, Varicella: pediatric genital/rectal vesicular lesions of unclear origin. *Ann Emerg Med.* 1995;25:111–114
2. Boyd M, Jordan SW. Unusual presentation of varicella suggestive of sexual abuse. *Am J Dis Child.* 1987;141:940. Letter
3. Coffin SE, Hodinka RL. Utility of direct immunofluorescence and virus culture for detection of varicella-zoster virus in skin lesions. *J Clin Microbiol.* 1995;66:2792–2795
4. Bays J, Jenny C. Genital and anal conditions confused with child sexual abuse trauma. *Am J Dis Child.* 1990;144:1619–1622
5. Kaplan KM, Fleisher GR, Paradise JE, Friedman HN. Social relevance of genital herpes simplex in children. *Am J Dis Child.* 1984;168:872–874
6. Gardner M, Jones J. Genital herpes acquired by sexual abuse of children. *J Pediatr.* 1984;104:246–244
7. Harel L, Cohen AV, Amir J, Varsano I. Zoster-like eruption associated with herpes simplex virus infection. *Clin Pediatr.* 1990;29:569–541
8. Cohen PR. Tests for detecting herpes simplex virus and varicella zoster virus infections. *Dermatol Clin.* 1994;12:51–68
9. Guess HA, Broughton DD, Melton LJ, et al. Epidemiology of herpes zoster in children and adolescents: a population-based study. *Pediatrics.* 1985;76:512–517
10. Nahass GT, Goldstein BA, Zhu WY, et al. Comparison of Tzanck smear, viral culture, and DNA diagnostic methods in detection of herpes simplex and varicella-zoster infection. *JAMA.* 1992;268:2541–2544
11. Moseley RC, Corey L, Benjamin D, Winter C, Remington ML. Comparison of viral isolation, direct immunofluorescence, and indirect immunoperoxidase for the detection of genital herpes simplex virus infection. *J Clin Microbiol.* 1981;13:913–918
12. Schmidt NJ, Gallo D, Devlin V, et al. Direct immunofluorescence staining for detection of herpes simplex and varicella-zoster antigens in vesicular lesions and certain tissue specimens. *J Clin Microbiol.* 1980;12:651–655
13. Ingram D, Everett D, Lyna P, White S, Rockwell L. Epidemiology of adult sexually transmitted disease agents in children being evaluated for sexual abuse. *Pediatr Infect Dis J.* 1992;11:945–950
14. Christian CW, Pinto-Martin JA, McGowan KL. The management of prepubertal children with gonorrhea. *Clin Pediatr.* 1995;64:415–418
15. Alexander ER. Misidentification of sexually transmitted organisms in children: medicolegal implications. *Pediatr Infect Dis J.* 1988;7:1–2

# Auricular Infections Caused by High Ear Piercing in Adolescents

Piercing of various body parts, including high ear piercing, is increasingly more common among adolescents. This fashionable choice of new and different body areas to pierce carries an additional risk of serious morbidity. In particular, an increase in serious infection with *Pseudomonas* and *Staphylococcus* is associated with high ear piercing. Most commonly, infection occurs in newly pierced ears and during warm-weather months.

## CASE REPORTS

### Case 1

During one summer, 3 weeks before admission, a 14-year-old girl had the auricular cartilage in each ear pierced with a piercing gun. Approximately 2½ weeks later, she noted swelling, erythema, and tenderness of her left ear surrounding the pin site. Drainage tubes were placed by an otolaryngologist on the anterior and posterior surface of the pinna. The patient was given 500 mg of dicloxacillin every 6 hours for 2 days and then 500 mg of

Received for publication Jul 18, 1996; accepted Oct 16, 1996.
Reprint requests to (R.S.) Division of Adolescent Medicine, Children's Hospital Medical Center of Akron, One Perkins Square, Akron, OH 44308–1062.
PEDIATRICS (ISSN 0031 4005). Copyright © 1997 by the American Academy of Pediatrics.


Downloaded from www.pediatrics.org by on June 28, 2005

cephalexin every 6 hours for 2 days. The infection progressed, with increased purulent drainage and swelling of the pinna. She was admitted to the hospital for incision and drainage of the abscess. Cultures grew *Pseudomonas aeruginosa* and *Staphylococcus* species coagulase negative, resistant to cephalothin. The infection resolved after 2 weeks of intravenous ceftazidime with the addition of intravenous tobramycin for 1 week. Some residual cartilaginous rim deformity remained.

### Case 2

During the summer, a 16-year-old girl had high transcartilaginous ear piercing bilaterally with a piercing gun. Two days later, swelling, erythema, and tenderness developed at the left pin site. The inflammation failed to respond after 5 days of 500 mg of cefadroxil every 12 hours. She was admitted to the hospital for incision and drainage of the abscess and intravenous antibiotics. Loss of auricular cartilage was noted at surgery when drains were placed. Intravenous nafcillin was changed to ceftazidime and tobramycin when wound cultures grew *P aeruginosa*. The patient was discharged and received 750 mg of ciprofloxacin twice daily for 2 weeks, with resolution of the infection, but she was left with a residual cosmetic deformity of the auricular rim.

## DISCUSSION

Body piercing with earrings, rings, small metal barbells, or gang symbols may result in serious untoward complications, especially when applied to oral tissue or avascular tissue such as the auricular cartilage. Occasionally, permanent damage and cosmetic deformities may occur.

Lingual piercing may result in permanent numbness, articulation disorder, loss of taste or movement, and swelling with respiratory embarrassment. Eating habits may be affected and may promote malnutrition or anemia. Objects pierced adjacent to the teeth or buccal mucosa may cause tooth fracture or oral mucosal inflammation and infection. Lip piercing may injure salivary gland ducts, leading to uncontrolled drooling.[1,2]

Piercing the auricular cartilage, even with strict aseptic technique, increases the likelihood of serious infection as a result of the avascular nature of this tissue site. Also, an indwelling foreign object hinders the healing process, as does perspiration triggered by warm-weather activities. The use of earrings devoid of nickel may be less irritating. In addition, some piercing guns may cause more trauma than others when the pin penetrates the hard cartilage of the ear. This, in turn, may give implanted pathogenic organisms an advantage in causing infection. Newly pierced ears exposed to *Pseudomonas* organisms in lakes or any stagnant water also are at an increased risk of infection.[1,2]

Postpiercing auricular infections usually occur within 3 to 4 weeks of the piercing event. The appearance of high-ear infections as a result of piercing initially may resemble minor cellulitis with erythema and tenderness of the pinna. Eventually, there is diffuse swelling of the auricle, often sparing the lobule. There is exquisite tenderness on deflecting the cartilage because of inflammation of the perichondrium, which distinguishes these deeper infections from those that involve only the skin.[3,4] Infection areas may rapidly progress to perichondritis, abscess, and necrosis of the involved cartilage. The patient may have fever, chills, and an elevated sedimentation rate. Commonly, cultures reveal staphylococcal organisms or *P aeruginosa*. The penicillinase-resistant penicillins and cephalosporins routinely chosen to treat skin and soft-tissue cellulitis or abscess of the ear lobule do not have the appropriate antibacterial activity against these organisms.

The new fluoroquinoline antibiotics, such as ciprofloxacin and norfloxacin, offer good antipseudomonal activity in addition to their activity against staphylococci. They may allow successful outpatient treatment in older adolescents and young adults.[5–7] Of the fluoroquinolones, ciprofloxacin is the most active against *P aeruginosa* in vitro. This class of antimicrobial agents also has good activity against staphylococcal species, but resistance can develop in patients with repeated or prolonged use. Their use is limited in children younger than 18 years because of the potential for damage to developing cartilage.[8]

Reportedly, some cosmetology schools that offer training in ear piercing advise their students to place pins in the soft tissue of the auricular rim, avoiding perforation of the cartilage.[9] The use of gentler piercing devices may have an advantage in reducing infections, especially when combined with aseptic technique, rigorous adherence to postpiercing cleaning techniques, and avoidance of summer piercing.[9]

These cases illustrate the more aggressive and serious nature of piercing infections in the cartilaginous pinna. Lobule infections often have a more benign course and more readily respond to local measures and oral antistaphylococcal antibiotics. Auricular infections typically occur in the first month after piercing and require very close observation and treatment. Consideration should be given to treatment with both antipseudomonal and antistaphylococcal antibiotic agents. If an abscess is present, surgical drainage and debridement will also be needed.

Ronna Staley, MD
James J. Fitzgibbon, MD
Catherine Anderson, LSM, MSN
Division of Adolescent Medicine
Children's Hospital Medical Center of Akron
Akron, OH 44308–1062

## REFERENCES

1. Bergstrom L. Diseases of the external ear. In: Bluestone CD, Stoole SE, eds. *Pediatric Otolaryngology*. Philadelphia, PA: WB Saunders Co; 1990: 315–316
2. Chen M, Scully C. Tongue piercing: a new fad in body art. *Br Dent J*. 1992;172:87. Letter
3. Cossette JE. High ear piercing. *Otolaryngol Head Neck Surg*. 1993;109: 967–968. Letter
4. Cumberworth VL, Hogarth TB. Hazards of ear-piercing procedures which traverse the cartilage: a report of *Pseudomonas perichondritis* and review of other complications. *Br J Clin Pract*. 1990;44:512–513
5. Dohar JE, Kenna MA, Wadowsky RM. Therapeutic implications in the treatment of aural *Pseudomonas* infections based on in vitro susceptibility patterns. *Arch Otolaryngol Head Neck Surg*. 1995;121:1022–1025
6. Hendershot EF. Fluoroquinolones. *Infect Dis Clin North Am*. 1995;9: 715–730
7. Noel SB, Scallan P, Meadors MC, Meek TJ, Pankey GA. Treatment of *Pseudomonas aeruginosa* auricular perichondritis with oral ciprofloxacin. *J Dermatol Surg Oncol*. 1989;15:633–637
8. Thomas JM, Swanson NA. Treatment of perichondritis with a quinolone derivative—norfloxacin. *J Dermatol Surg Oncol*. 1988;14:447–449
9. Widick MH, Coleman J. Perichondrial abscess resulting from a high ear-piercing. *Otolaryngol Head Neck Surg*. 1992;107:803–804


Downloaded from www.pediatrics.org by on June 28, 2005

**Auricular Infections Caused by High Ear Piercing in Adolescents**
Ronna Staley, James J. Fitzgibbon and Catherine Anderson
*Pediatrics* 1997;99;610-
DOI: 10.1542/peds.99.4.610

**This information is current as of June 28, 2005**

| | |
|---|---|
| **Updated Information & Services** | including high-resolution figures, can be found at: http://www.pediatrics.org/cgi/content/full/99/4/610 |
| **Citations** | This article has been cited by 5 HighWire-hosted articles: http://www.pediatrics.org/cgi/content/full/99/4/610#otherarticles |
| **Subspecialty Collections** | This article, along with others on similar topics, appears in the following collection(s): **Infectious Disease & Immunity** http://www.pediatrics.org/cgi/collection/infectious_disease |
| **Permissions & Licensing** | Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at: http://www.pediatrics.org/misc/Permissions.shtml |
| **Reprints** | Information about ordering reprints can be found online: http://www.pediatrics.org/misc/reprints.shtml |

American Academy of Pediatrics
DEDICATED TO THE HEALTH OF ALL CHILDREN™

Downloaded from www.pediatrics.org by on June 28, 2005