

Case Report**Infection on post transcartilaginous ear piercing****Hemastia Manuhara Harba'i***, **Nydia Triana*****Department of Otorhinolaryngology-Head and Neck Surgery,
Mitra Keluarga Hospital, Tangerang, Banten**ABSTRACT**

Background: Body piercing is getting more popular nowadays as a body modification. Piercing is an invasive procedure with the possibility of complications. Researchers had found the rate of body piercing complications at 20.5%. The often found complications are allergic contact dermatitis, inflammation, bleeding, and infection. Some piercings at different sites of human body have more risks to become infected. The cartilaginous part of the ear has a higher risk of significant infection, because of the avascular nature of auricular cartilage that could lead to poor wound healing. Small local infection can progress into perichondritis or abscess. Perichondritis or perichondral inflammation is a severe and a very frequent complication. Pinna edema and spreading of infection could occur if the treatment is delayed. Subperichondral abscess with possible cartilage ischemic necrosis could be the consequence. **Purpose:** To evaluate the risk of infection after a transcartilaginous piercing. **Case Report:** Presenting 2 cases of auricular perichondritis treated at ENT Head and Neck Surgery Department, Mitra Keluarga Gading Serpong Hospital. **Clinical question:** Is infection the most frequent complication of ear piercing? **Review method:** Searching literature through PubMed and ProQuest with keyword of "Ear Piercing Infection". Further selection was performed through clinical question. **Result:** The search found one journal disclosing a case of a 29-year-old patient diagnosed with auricular perichondritis who had the same symptoms as both of our reported patients. **Conclusion:** Piercing is an invasive procedure. Knowledge of the risks, precautions, and potential complications is important to reduce the peril of serious complications of piercing.

Keywords: post piercing infection, ear infection, perichondritis, ear abscess**ABSTRAK**

Latar belakang: Saat ini, tindik pada anggota tubuh semakin populer sebagai salah satu bentuk modifikasi tubuh. Tindik merupakan prosedur yang invasif dengan kemungkinan terjadinya komplikasi. Penelitian terdahulu menyatakan komplikasi dari tindik tubuh sebanyak 20.5%. Komplikasi yang paling umum terjadi adalah dermatitis kontak alergi, inflamasi, perdarahan, dan infeksi. Tindik pada lokasi tubuh tertentu memiliki risiko yang lebih tinggi untuk mengalami infeksi. Bagian tulang rawan pada telinga memiliki risiko tinggi untuk mengalami infeksi yang signifikan, karena pada dasarnya tulang rawan tidak memiliki pembuluh darah sehingga proses penyembuhannya kurang baik. Infeksi kecil lokal dapat menjadi perikondritis atau abses. Perikondritis atau inflamasi perikondrial adalah komplikasi berat yang sangat umum terjadi. Edema pada bagian daun telinga dan penyebaran infeksi dapat terjadi apabila tatalaksana tidak segera dilakukan. Sebagai akibatnya, dapat timbul abses subperikondrial dengan kemungkinan nekrosis tulang rawan. **Tujuan:** Untuk mengevaluasi risiko infeksi setelah melakukan tindik pada tulang rawan. **Laporan kasus:** Melaporkan 2 kasus perikondritis yang ditatalaksana oleh dokter spesialis Telinga, Hidung, dan Tenggorok di Rumah Sakit Mitra Keluarga Gading Serpong. **Pertanyaan klinis:** Apakah infeksi merupakan komplikasi yang paling sering terjadi pada tindik telinga? **Metode:** Mencari literatur melalui PubMed dan ProQuest dengan kata kunci "Infeksi Tindik Telinga". Pencarian selanjutnya dilakukan melalui pertanyaan klinis. **Hasil:** Satu jurnal menyajikan laporan kasus tentang pasien berumur 29 tahun dengan diagnosis perikondritis yang memiliki gejala yang serupa dengan kedua pasien pada laporan kasus ini. **Kesimpulan:** Tindik

adalah tindakan yang invasif. Pengetahuan tentang risiko, pencegahan, dan potensi komplikasi yang dapat terjadi, merupakan hal yang penting untuk menurunkan kemungkinan terjadinya komplikasi serius dari tindak.

Kata kunci: *infeksi pasca tindak, infeksi telinga, perikondritis, abses telinga*

Correspondence address: Hemastia Manuhara Harba'i, Department of Otolaryngology, Head and Neck Surgery, Mitra Keluarga Hospital, Tangerang, Banten. Email: hemastia.manuhara@gmail.com

INTRODUCTION

Body piercing was first found archeologically 5300 years ago, with the earliest sites of body pierced were ears, nose, and mouth. Body piercing is getting more popular nowadays as a body modification beside tattoos. The most common site of body piercing is the ear, but in the last few years, other sites are also popular to be pierced, such as the mouth, nose, eyebrows, nipples, navel, and genitals.¹ Researchers found that 14% of people aged 18 to 50 years old had a body piercing in locations other than the earlobe.²

Women are more likely to get their body pierced than men. Individuals aged 24 to 34 years old are the highest prevalence of body piercings.³ Reasons of body piercing are fashion, religious purposes, passion, and sexual practice.^{4,5} In Indonesia, piercings are often given very early, new born up to the 1st week of birth, baby girls are pierced at the earlobe as a sign of their gender. One of the reasons for doing ear piercing at the early age, is because the child will not be aware of the pain.⁵

Piercing is defined as a procedure of inserting a needle to create a hole (a fistula) into a cartilage or skin for the wearing of decorative rings, or studs, or pins.⁴ Topical anesthesia are not common to be used in body piercing.² Healing times for body piercings vary by sites of body pierced and range from 2 weeks to 9 months.³ Navel takes the longest time to heal which can take up to 12 months. Lip, earlobe, eyebrow, and nostrils can heal more rapidly, which is 6-8 weeks.¹

Piercing is an invasive procedure with the possibility of complication.² Researchers have found the rate of body piercing complications at 20.5%.⁵ The most common type of complications are allergic contact dermatitis, inflammation, bleeding, and infection such as localized cellulitis. If not treated adequately, it can lead to more serious complications.¹ Some piercings at different sites of the body have higher risks to become infected. Genital piercings are more likely to get infected because of their locations, nipple piercings infection can lead to subareolar breast abscesses. 'High' ear piercings through the cartilage of the pinna are more associated with bad healing and more significant infection, because of the avascular nature of auricular cartilage that can lead to poor wound healing.^{2,6}

The external ear is the outer part of the hearing apparatus that is visible to human eye. It is including the auricle (pinna) and external auditory canal. The pinna is a funnel to deliver sound to the external acoustic meatus.⁷ The external ear is a flexible structure, supported by elastic cartilage that covered in skin and attached to the skull with ligaments and muscles. The skin of pinna (Figure. 1) is rich in sebaceous gland. The helix is the outer posterosuperior part of the ear, it curves slightly inward. The antihelix is a convex peak structure near the helix. Tragus located anteriorly to the acoustic meatus and concha. The inferior part of a pinna, hangs a lobule (earlobe), which is not a cartilaginous structure, it contains areolar connective tissue.⁸

The arterial vascular supply of the auricle is based on interconnections between branches of the superior temporal artery (STA) that supply the anterior surface of the auricle, and the branches of the posterior auricular artery (PAA), which supply the posterior surface of the auricle (Figure. 2).⁹ The cartilaginous parts of the auricle have a relatively avascular nature because of its structure, and get the nutrients from the overlying skin. The skin is supplied with blood by the PAA and STA. The devoid-cartilage lobule is more supplied by arterial blood; hence it displays better healing after piercing.⁷ Sensory innervation of the outer part of the ear is supplied by both cranial and spinal nerves. Branches of the trigeminal (CN V), facial (CN VII), and vagus (CN X) are the cranial nerves structures, while the lesser occipital (C2, C3) and greater auricular (C2, C3) nerves are the spinal structures. Motor innervation of the external ear muscle is supplied by the branches of the facial (CN VII) nerves.

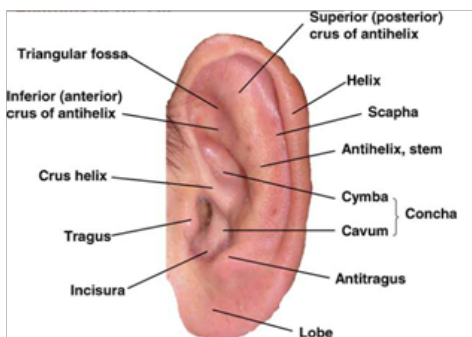


Figure 1. Anatomy of human pinna

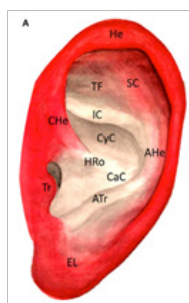


Figure 2. The contribution of the STA and PAA to the arterial blood supply of the auricle⁹

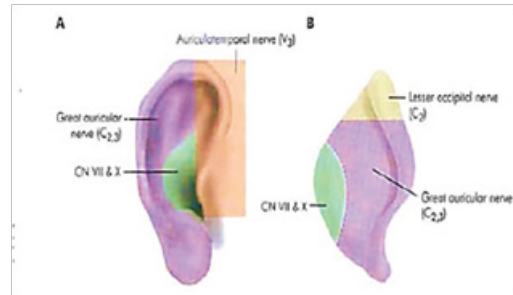


Figure 3. Pinna nerves supply

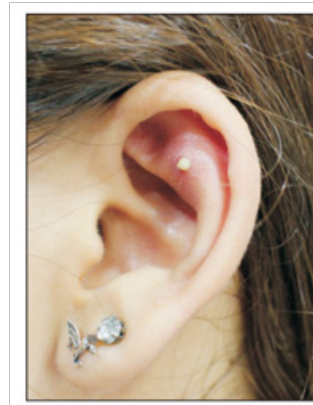


Figure 4. Local infection after helix piercing¹²

Many complaints of infections related to body piercings have been reported, with the most incidents are ear piercings. Bacterial infections occur because of unsterile technique by unqualified individuals, and incorrect aftercare instruction.¹⁰ Most of piercings are done in tattoo and piercing parlors. Soft earlobes piercings are often done in jewelry or department stores. Untrained individuals are mostly the one in charge of piercings.⁴ Local soft tissue infection, perichondritis, sepsis, and toxic shock syndrome are reported as ear post-piercings infections.¹¹

Small local infection (Figure. 4) can progress into perichondritis (Figure. 5) or abscess (Figure 6). Perichondritis or perichondral inflammation is a severe and a very frequent complication. The symptoms are ear pinna redness (except for the ear lobe), intense pain, and fever. Pinna edema and spreading of infection can occur if the treatment is delayed. Subperichondral abscess with possible cartilage ischemic necrosis could be the consequence.¹¹ Auricular

perichondritis and auricular abscess can occur in the first month post-piercing. Most common pathogens can be cured with fluoroquinolone antibiotic treatment. Surgical incision and drainage may be needed in the case of abscess.¹¹



Figure 5. Auricular perichondritis after a high ear piercing¹³



Figure 6. Perichondrial abscess caused by high ear piercing

CASE REPORT

Case 1

Mrs. D, a 31-year-old Master's graduate, came to Otorhinolaryngology outpatient clinic with symptoms of redness, pus, and tenderness on the left ear. She also declared a fever. Patient just got a high ear piercing on her left ear done 3 weeks before (Figure. 7, 8). She denied any signs of hearing loss, fluid coming out of the ears, dizziness, and itchy ears. On physical examination, there was no abnormality found in the inside of the ear. One week previously the patient removed the piercing at home, but the pus still came out (Figure 9).



Figure 7. Redness, 2 weeks post-piercing



Figure 8. Pus, 2 weeks post-piercing

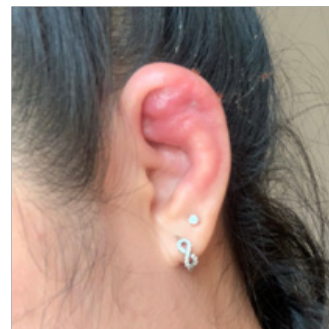


Figure 9. The piercing was removed, the symptoms persisted

At the hospital, she refused to undergo surgery, so drainage incision was performed at the outpatient clinic to remove the pus. The patient was then given prescription of antibiotics, steroid, and pain reliever. The antibiotics were clindamycin 300 mg twice daily and metronidazole 500 mg three times daily. Methylprednisolone 4 mg three times daily was prescribed to relieve inflammation. The pain killer was sodium diclofenac 50 mg twice daily. One week later, patient came back with less tenderness on the left ear, but the left ear was swollen, and pus was still oozing. The patient then agreed to have a surgery.

The surgery began with a 2 cm incision on the scapha and retroauricular part. The next step was exploration of the abscess. The wound then cleaned with sodium chloride, povidone iodine, and hydrogen peroxide, and stitched afterwards. Wing needle as a drainage was inserted. Pressure gauze balls were also placed anteriorly and inferiorly. The surgery was finalized with gauze pressing to the helix. (Figure 10,11). The patient then hospitalized for 2 days, then the drain was removed. The pus was cultured and the result revealed that the bacteria growing bacteria was *Pseudomonas aeruginosa*.



Figure 10. Post-surgery (anterior side)



Figure 11. Post-surgery (posterior side)



Figure 12. Post-surgery

One week after the surgery, the patient came to the outpatient department. The gauze balls were removed. Patient stated that the pain and the swelling had reduced. The shape of the ear appeared the same as normal as the infection. The stitches wound also looked good.

Case 2

Ms. S, a 16-year-old teenage girl came to Otorhinolaryngology outpatient clinic with symptoms of swollen left ear, pus, and tenderness. She denied any signs of hearing loss, nor fluid coming out of the ears, dizziness, and itchy ears. Upon physical examination, there was no abnormality in the ear canal. She was a mixed raced Korean-Indonesian high school student, with highly educated and aesthetics conscious parents. Patient got a piercing on the left ear 2 weeks previously. The piercing was inserted to the scapha through the antihelix. She refused to go through surgery. So, at the outpatient clinic, the piercing was removed, and a drainage incision was performed. The wound then wrapped up and pressed using gauzes, anteriorly and posteriorly.

The patient was then given prescription of antibiotics, steroid, and pain killer. The antibiotics were clindamycin 300 mg twice daily and metronidazole 500 mg three times daily. Methylprednisolone 4 mg three times daily was prescribed to relieve inflammation. The pain reliever was sodium diclofenac 50 mg twice daily. One week later, she came back with the same symptoms and consented to undergo a surgery. (Figure 13).



Figure 13. Swollen and redness of left ear

The surgery began with a 2 cm incision on the scapha. The next step was the exploration of the abscess. The wound then cleaned with sodium chloride, povidone iodine, and hydrogen peroxide, and then stitched. Drainage was inserted using wing needle. Pressure gauze balls were placed anteriorly and inferiorly. The surgery was finalized with gauze pressing to the helix. (Figure 14,15). The patient was hospitalized for 2 days, then the drain was removed. The pus was cultured, and the result showed that the growing bacteria was *Pseudomonas aeruginosa*.



Figure 14. Post-surgery (anterior side)



Figure 15. Post-surgery (posterior side)



Figure 16. Post-surgery

One week after the surgery, she came to the outpatient department. The pressure gauze balls were removed. Patient stated that the symptoms were gone, there was no pain nor swelling. The shape of the ear could be maintained the same as before the infection. The stitches wound also came out good.

CLINICAL QUESTION

Is infection the most frequent complication of ear piercing?

METHOD

Patient: Patients with outer ear Infection.

Intervention: Ear piercing.

Literature search through PubMed, and ProQuest with keywords of “ear piercing infection” revealed 4 Literatures (in PubMed) and 1 Literature (in ProQuest). The selection was conducted through the last 5 years interval publication dates, English language, and free full text. These articles were based on inclusion criteria: studies related to ear infection caused by ear piercing, while the exclusion criteria: (1) ear infection caused by trauma; and (2) non-English research articles.

Further selection through the clinical question, the result was one case report titled: “Auricular Perichondritis after a High Ear Piercing”, a case report stated that ear piercing can cause infection that resulted in ear abscess.⁵

RESULTS

From the PubMed databases on 2021, there was a case report by Federico et al.¹³ about a 29-year-old woman with 2 days history of swelling and severe pain on her left ear. She had an upper lateral scapha piercing 1 day before. Based on the clinical findings (history taking, physical examination, and

laboratory testing), it was confirmed that the patient had an auricular perichondritis. The patient was given oral levofloxacin daily for 7 days. She got herself an over-the-counter analgesic to relief the pain. After completion of the therapy, the erythema, swelling, and pain had resolved, and there was no pinna deformity.

DISCUSSION

Body piercing is a worldwide trend. It is a common thing to do in children and adults.^{5,13} It is a fashion trend with significant implications for health. Individuals often make decisions regarding body piercing after consultation with piercers or internet sources, rather than health care providers.¹ High ear piercing (the upper third part of the pinna) has become more popular and frequently done in the last 20 years. It is the third most common body site to do piercing. Unfortunately, cartilage ear piercing is usually performed without sterile technique and by unqualified individuals who are not aware of the complications that might happen.¹⁰

Complications following a body piercing are allergic reactions, auricular perichondritis, embedded earrings, cellulitis, hypertrophic scarring, keloid formation, and traumatic tears.¹³ Systemic infection following piercing is rare, but hepatitis B, C, D, and G have occurred. No transmission of HIV has been proven, but a theoretical risk exists.⁶ Individuals with the conditions of higher risk to infection and high likelihood of hemorrhage have a greater risk of complications.¹

A study in France in 2018 by Kluger et al,³ reported a total of 33.6% of people with body piercing had skin problems. For 73.3% of the respondents, the problem occurred only once and had been resolved, but for the rest, the skin problem was recurrent or chronic and persistent. Among the skin problems, infection was the most common happening. In another study by Van Hoover et al.¹ in

2017, infection is also the most frequent complication of ear piercing.

Keloid being the most frequent complication in Gabriel et al.⁵ study, was partly because most of the patients came late to the doctor, so that the acute infection phase had passed. In this case report, our patients came to the department clinic in less than 2 weeks after the onset of symptoms. The patients also came from financially stable families and very well educated people.

The most common etiologies of post piercing infection are *Pseudomonas* spp., *Staphylococcus aureus*, and group A streptococci.¹² Serious infection caused by *Pseudomonas* and *Staphylococcus* are commonly seen in high ear piercings, especially in newly pierced ears and during warm-weather months.¹¹ Infections are usually localized, although there are a few reports of life-threatening and distant infections.⁴

In this case report, bacteria culture test was performed in both cases, with results of growing of *Pseudomonas aeruginosa*. Perichondritis is the most frequent complication of cartilage site of the ear, such as helix or concha. The avascular nature of cartilage supports the incidence rate of perichondritis. The symptoms are tenderness, edema, and burning sensation in the auricular area. Abscess could also be formed in perichondritis with the sign of fluctuant swelling. A study Hyun et al.¹² study reported 95% of perichondritis cases were caused by *Pseudomonas* infection.

Both patients in this case report was ear piercing that performed in the cartilage part of the ear. The first patient had ear piercing at the helix, and the second patient, had the piercing at the scapha through the antihelix. Both patients complained of tenderness, edema, and abscess. They also complained fever as a common symptom of infection. Both our patients showed the same symptoms as the patient from Tobar et al.¹³ case report.

The localized trauma on the pinna can cause the extraction of the adjacent perichondrium that can cause cartilage devascularization and small fractures which increases the susceptibility to infection. The use of piercing gun also may additionally increase the risk of infection. The avascular nature of cartilage limits the immune response and the effectiveness of antibiotic, so in some cases, incision and drainage are required after a culture test.¹⁰

Removal of jewelry from an infected wound can cause abscess formation.¹ Preferred treatment for this kind of case is antibiotic, preferably, fluoroquinolone (e.g levofloxacin) and regular cleaning. If the infection has not healed within 5 to 7 days, the jewelry has to be removed and the wound should be treated with surgical incision and drainage.¹ Antibiotic can be given intravenously at the hospital, especially in the case of infected auricle piercings that has a high risk of necrosis.¹ If an abscess has been formed, it is crucial to do an incision and drainage with vigorous irrigation to prevent cartilage collapse.¹² Auricular perichondritis and auricular abscess could occur in the first month post-piercing. Both of our patients had auricular abscess in less than a month after a piercing was done.

Rodriquez et al.¹⁰ stated that, the delay time between the onset of symptoms and doctor consultation more than 5 days is more likely to result in hospitalization. Antibiotics should be administered to prevent permanent ear deformity (cauliflower ear). Infections may require prolonged antimicrobial therapy, also a surgical incision and drainage if needed. However, even with adequate treatment, this infection might result in cartilage necrosis and deformity of the pinna.

Both patients were given 2 kinds of antibiotics, namely metronidazole and clindamycin because they refused to undergo surgery. The antimicrobial sensitivity tests for both cases revealed that, they were sensitive

to these antibiotics. Fluoroquinolone was not used in these cases because it is a very high generation of antimicrobials. After consuming the antibiotics for 1 week, both patients came to ENT Department clinic with persisted symptoms. Both patients then underwent surgery consisting incision and drainage. One-week post-surgery the symptoms were better.

Piercing is an invasive procedure. Knowledge of the risks, precautions, and potential complications is important to reduce the peril of serious complications of piercing. Underwent a piercing at unclean places, with an untrained piercer, non-sterile tools, and combined with poor hygiene, could lead to post piercing infection.

REFERENCE

1. Van Hoover C, Rademayer C-A, Farley CL. Body piercing: Motivations and implications for health. *Journal of Midwifery & Women's Health*. 2017; 62(5): 521-30.
2. Halloran L. Body piercing: Avoiding complications. *The Journal for Nurse Practitioners*. 2015; 11(1): 142-3.
3. Kluger N, Misery L, Seit  S, Taieb C. Body piercing: A national survey in France. *Dermatology*. 2018; 235(1): 71-8.
4. Holbrook J, Minocha J, Laumann A. Body piercing. *American Journal of Clinical Dermatology*. 2012; 13(1): 1-17.
5. Gabriel OT, Anthony OO, Paul EA, Ayodele SO. Trends and complications of ear piercing among selected Nigerian population. *Journal of Family Medicine and Primary Care*. 2017; 6(3): 517.
6. Patel M, Cobbs CG. Infections from Body Piercing and Tattoos. *Microbiology Spectrum*. 2015; Dec.
7. Szymanski A, Geiger Z. Anatomy, Head and Neck, Ear [Internet]. National Library of Medicine. 2022 [cited 13 May 2022]. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK470359/>
8. White HJ, Peterson DC. Anatomy, Head and Neck, Ear Organ of Corti [Internet]. National

- Library of Medicine. 2019 Jan [Cited 13 May 2022]. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK538335/>
9. Zilinsky I, Erdmann D, Weissman O, Hammer N, Sora M-C, Schenck TL, et al. Reevaluation of the arterial blood supply of the Auricle. *Journal of Anatomy*. 2016; 230(2): 315-24.
 10. Rodríguez Gutiérrez J, Thöne N, Duque Benavides J, Brañes Fierro R. Infected transcartilaginous ear piercings. A case report and review of the literature. *ARS MEDICA Revista de Ciencias Médicas*. 2019; 44(2): 23-25.
 11. Hanif J. Lesson of the week: “High” ear piercing and the rising incidence of perichondritis of the pinna. *BMJ*. 2001; 322(7291): 906-7.
 12. Hyun S. Common complications after auricular piercing in Korea: case reviews and treatment. *Journal of Cosmetic Medicine*. 2017; 1(2): 85-89.
 13. Tobar D, Kosoko A. Auricular perichondritis after a “high ear piercing”: A case report. *Journal of Education and Teaching in Emergency Medicine*. 2021;6(2): 30-3.