Gazi Med J 2026;37(1):123-125

DOI: http://dx.doi.org/10.12996/gmj.2026.4378

Cauliflower Ear Caused by *Pseudomonas aeruginosa* After "High" Ear Piercing

Yüksek Yerleşimli Kulak Piercingi Sonrası Pseudomonas aeruginosa'ya Bağlı Karnabahar Kulak Gelişimi

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ABSTRACT

Although piercing has become increasingly common, the lobule and auricular cartilage are among the most frequent sites. If this procedure is performed by untrained personnel, it increases the risk of perichondritis in the auricular cartilage. When perichondritis develops, increased local temperature, erythema, and pain in the auricle are warning signs for early diagnosis; if an abscess is present, drainage and antibiotic therapy are essential.

Keywords: Ear, piercing, perichondritis, Pseudomonas Aeruginosa

ÖZ

Piercing işlemi giderek yaygınlaşsa da, en sık uygulanan bölgeler arasında kulak lobülü ve aurikula kıkırdağı yer almaktadır. Bu işlem tecrübesiz kişiler tarafından yapılırsa, aurikula kıkırdağında perikondrit riskini artırır. Perikondrit geliştiğinde, aurikulada lokal olarak artmış sıcaklık, kızarıklık ve ağrı erken teşhis için uyarı işaretleridir; apse varsa drenaj ve antibiyotik tedavisi şarttır.

Anahtar Sözcükler: Kulak, piercing, perikondrit, Pseudomonas Aeruginos

INTRODUCTION

Piercing may result in health consequences, ranging from minor problems to potentially life-threatening situations (1). One of these problems is the development of cauliflower ear. Cauliflower ear results in an irregular ear shape, loss of natural contours, decreased cartilaginous support, and permanent aesthetic deformity (2). Cauliflower ear can be caused by infections that develop after piercings of the auricular cartilage performed under inappropriate conditions (3).

In this case report, the management of a patient who developed an auricular abscess after piercing is reviewed in light of the literature.

CASE REPORT

The female patient presented to our clinic with recurrent swelling of the right auricle for approximately 20 days following auricle piercing. In her past medical history, she presented to an otolaryngology clinic at an external center and was hospitalized there before being admitted to us. During this period, the patient's auricular abscess was drained with a syringe, and a silicone material, shaped to apply pressure to the anterior and posterior portions of the auricle, was sutured; 2 x 1 g ceftriaxone disodium (Eqiceft iv, Tüm*Ekip İlaç) and 3 x 500 mg metronidazole (Fladazol iv, Koçak Farma İlaç) were prescribed. After a 3-day hospital stay, the patient was discharged with a prescription for 1 x 600 mg of cefdinir (Cempes, po, Sanovel İlaç) and 3 x 500 mg of metronidazole (Flagyl, po, Sanofi). Three days later, she was recalled

Cite this article as: Kumbul YÇ, Tuncel Y, Yeşilkuş F, Yasan H, Ünal O. Cauliflower ear caused by *Pseudomonas aeruginosa* after "high" ear piercing. Gazi Med J. 2026;37(1):123-125

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Received/Geliş Tarihi: 21.01.2025
Accepted/Kabul Tarihi: 02.01.2026
Publication Date/Yayınlanma Tarihi: 19.01.2026

for an outpatient clinic follow-up. During outpatient clinic follow-up, swelling exceeding the boundaries of the silicone material was observed, and the abscess was drained again using a syringe, without dislodging the silicone material. The patient, who showed insufficient clinical improvement (fever of 38.5 degrees and worsening otalgia), was referred to us the same day without removal of the silicone material from her ear (Figure 1a).

Removal of the silicone material sutured to the superior region of the right auricle in the external center resulted in hyperemia, increased temperature, and swelling of the auricle. When the swollen area was punctured using a syringe, pus emerged; incision and drainage were performed. During the drainage procedure, deformation of the cartilaginous structure was observed at the abscess drainage site. Notably, the anterior and posterior surfaces of the skin in that area were in contact. A Penrose drain was inserted along the incision line and a pressure dressing was applied (Figure 1b). The patient was informed that a deformity may develop of the auricle. A specimen of the drained abscess pus was sent for culture. Intravenous antibiotic therapy was planned for the patient, and she was admitted to our service for close observation. In the patient's complete blood count, white blood cells were 9.8 mg/dL, neutrophils were 7.9 mg/dL, and C-reactive protein was 6 mg/dL. The patient was referred to the infectious diseases clinic and was empirically started on 3 × 4.5 g piperacillin sodium/tazobactam sodium (Tazoject IV, Tüm*Ekip İlaç). The next day, a button was sewn in place to apply pressure to the superior aspect of the right auricle (Figure 1c). When *Pseudomonas aeruginosa* was isolated from the abscess culture on day 4, the patient was referred again to the infectious diseases clinic. The patient's antibiotic therapy was changed to meropenem trihydrate, 3 × 500 mg (Merosid iv, Koçak Farma İlaç). The patient's Penrose drain was removed on the same day. On the 5th day, the button in the auricle was removed. After the patient had received meropenem trihydrate for a total of 5 days, because the complete blood count was unremarkable and auricular findings on examination had regressed (Figure 1d). At discharge, the patient was prescribed 2 x 750 mg ciprofloxacin hydrochloride (Cipro po, Biofarma); 2 x 1 g amoxicillin + clavulanic acid (Augmentin po, GlaxoSmithKline); and 2 x 1 bacitracin + neomycin sulfate skin pomade (Thiochilline, Abdi İbrahim İlaç). At the 1-week and 3-month follow-up visits, cauliflower deformity of the auricle was observed, but there were no signs of inflammation (Figure 1e and 1f). Informed consent was obtained from the patient for presentation of this case report.

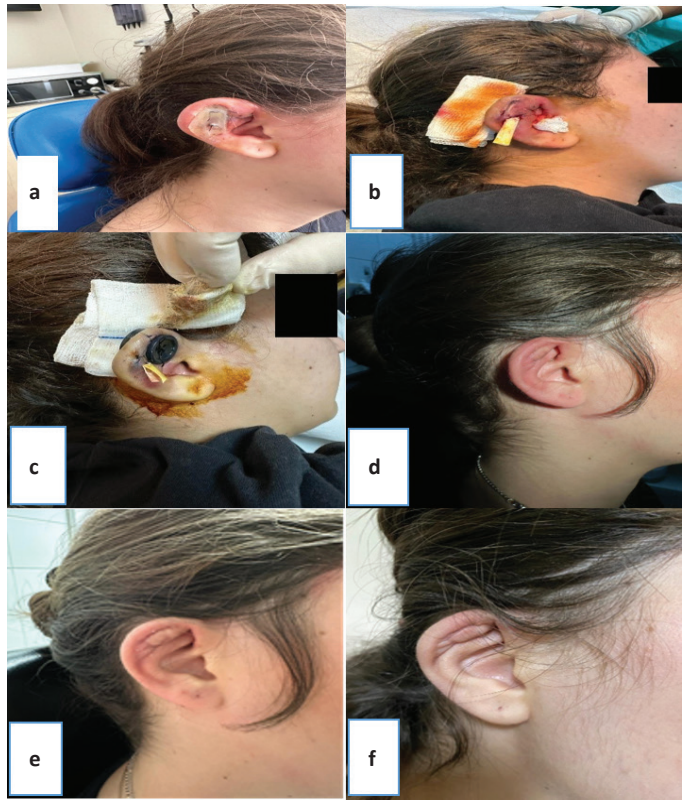

Figure 1. Image of the patient at the time of admission (a), confirmation of diagnosis after drainage (b), button sewed to the auricle on the 2nd day of admission (c), image of the auricle at discharge from hospital (d), image of the auricle in the 1st week (e), image of the auricle in the 3rd month (f).

DISCUSSION

Piercing the cartilage in the upper third of the auricle, known as "high ear piercing", has become increasingly common. Infection involving the cartilage in this area, called perichondritis, can often lead to cartilage loss, resulting in an unsightly deformity known as "cauliflower ear" (1). An Auricular abscess may develop secondary to untreated or inadequately treated perichondritis. In our case, there was a piercing located high on the right auricle. The presence of swelling on physical examinationat the time of application made us suspect that there might be an abscess developing on the basis of perichondritis. The quickest way to confirm the diagnosis of an abscess is to aspirate the pus with a syringe. In this case, aspiration of pus with a syringe confirmed the diagnosis of an abscess. To prevent auricular perichondritis or abscess, it is imperative to maintain strict hygiene during piercing. A common feature of patients who develop perichondritis and abscess is that they have had piercings performed in unregulated settings, as in our patient.

Pseudomonas aeruginosa is common in nature, and moist surfaces are suitable environments for its proliferation. It can cause otitis externa, keratitis, folliculitis, postoperative abscesses, and burn infections in immunocompetent individuals. *Pseudomonas aeruginosa* is a common causative agent in cases of perichondritis with abscess. In infections without abscess formation, *Staphylococcus aureus* is the predominant pathogen (4). Our patient was empirically started on piperacillin–tazobactam because she had previously received multiple antibiotic regimens without clinical response. However, because the patient's clinical condition did not improve sufficiently and the culture results showed only moderate susceptibility to piperacillin-tazobactam, the antibiotic treatment was changed to meropenem, to which the isolate was susceptible.

In our case, *Pseudomonas aeruginosa* was isolated from the abscess culture, and the antibiogram showed I (susceptible, increased exposure) for piperacillin-tazobactam and ciprofloxacin and S (susceptible, standard dosing regimen) for meropenem, according to European Committee on Antimicrobial Susceptibility Testing (EUCAST) criteria. The patient demonstrated clinical and laboratory improvement following intravenous piperacillin-tazobactam and meropenem therapy. According to the current EUCAST definition, category "I" antibacterial activity is assigned only when the drug

attains increased tissue or serum exposure (5). Therefore, high-dose ciprofloxacin (750 mg twice daily) was preferred during the sequential oral treatment phase to achieve adequate tissue concentrations against *Pseudomonas aeruginosa*. Although *Pseudomonas* was the only pathogen isolated, the patient's prior outpatient empirical antibiotic exposure may have suppressed the growth of certain bacteria in culture, such as Gram-positive or anaerobic bacteria. Anaerobic bacteria are difficult to isolate under routine clinical laboratory conditions because of their specific transport and culture requirements, which can lead to under-detection of these organisms, particularly in infections such as abscesses, where low oxygen tension favors polymicrobial growth. Therefore, amoxicillin-clavulanic acid was added to the treatment following parenteral therapy to maintain efficacy against *Pseudomonas* and to ensure coverage of possible concomitant anaerobic or gram-positive cocci that were not demonstrated in culture.

The auricular cartilage does not have a specific blood supply, and its nutrition is provided by the perichondrium immediately superficial to it. Any subperichondrial bleeding that occurs during cartilage piercing further reduces blood flow to the cartilage and increases the likelihood of infection. The resulting abscess hydrostatically lifts the perichondrium and the skin, thereby further limiting blood flow to the cartilage. Once an infection begins, antibiotics have a limited effect on cartilage that is no longer nourished; therefore, incision and drainage procedures are required for treatment (6). The culture of material obtained during drainage guides treatment. Specifically, from culture, the pathogenic microorganism that grows is identified and the antibiotics to which it is susceptible are determined. In this way, the patient receives the most effective antibiotic treatment. Even with antibiotic treatment, drainage, and debridement, a deformity ("cauliflower ear") may occur (1). This rate is much higher, especially among patients whose treatment was delayed, as in the case we presented.

Aggressive treatment initiated early in cases of suspected perichondritis is imperative to prevent irreversible ear deformity. Although antibiotics are started in almost every case, caution should be exercised if an abscess develops in patients who do not respond to antibiotics. If an abscess has developed, local wound care, incision and drainage, irrigation, tamponade, and dressing application should be added to the treatment steps (7). Before the patient in the present case presented to us, abscess drainage had been attempted using an injector, but the patient's treatment was unsuccessful. We recommend using syringes in such cases only to confirm the diagnosis when clinical findings are present. Incision with drain placement for therapeutic purposes seems to be a more suitable option for the treatment of an auricular abscess. In addition, attention to primary health care is an important factor in reducing these infections. For this reason, we recommend that businesses that perform under-the-counter piercings be closed down, and that establishments that operate professionally in this area be regularly inspected to ensure hygienic practices.

CONCLUSION

Early diagnosis of ear perichondritis is important, and aggressive treatment should be initiated promptly to prevent abscess formation. Incision and drainage are essential if an abscess develops. Antibiotic therapy should initially be targeted against *Pseudomonas aeruginosa*, and an abscess culture should be obtained. Antibiotic therapy may be revised based on culture results.

Ethics

Informed Consent: Informed consent was obtained from the patient for presentation of this case report.

Footnotes

Authorship Contributions

Surgical and Medical Practices: Y.Ç.K., Y.T., F.Y., H.Y., O.Ü., Concept: Y.Ç.K., Y.T., F.Y., H.Y., O.Ü., Design: Y.Ç.K., Y.T., F.Y., H.Y., O.Ü., Data Collection or Processing: Y.Ç.K., Y.T., F.Y., H.Y., O.Ü., Analysis or Interpretation: Y.Ç.K., Y.T., F.Y., Literature Search: Y.Ç.K., Y.T., F.Y., H.Y., Writing: Y.Ç.K., Y.T., F.Y.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

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