

ORIGINAL RESEARCH

Auricular perichondritis in a patient with personal antecedents of type II diabetes and radical mastoidectomy

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Auricular perichondritis is a rare but severe complication that can occur in patients who have experienced ear trauma or are suffering from an immunosuppressive condition. Its treatment is difficult and time-consuming, and the prognosis is usually poor. We present the case of a 68-year-old patient with personal antecedents of ear surgery, type II diabetes, and signs of poor local hygiene who was admitted to our ENT department with a swollen, painful, erythematous pinna and treated empirically for 3 weeks with systemic antibiotics (cefuroxime), local drainage, and application of antiseptic medication (iodine solution and boric acid). Considering the long hospitalization time and the multiple comorbidities of our patient, the present case report is aimed to highlight the importance of a diversified approach to treatment in patients vulnerable to auricular perichondritis.

Keywords: auricular perichondritis, ear, infection, incision, diabetes, treatment

Introduction

Auricular is the inflammation of the perichondrial layer surrounding the cartilage of the pinna. It is an uncommon but severe complication that can occur after ear piercings, otologic surgery, burn, or autoimmune diseases. The most common bacterial etiology is represented by *Pseudomonas aeruginosa*, followed by *Staphylococcus aureus* and *Escherichia coli* (1). The infection usually presents itself with dull pain, erythema, and swelling of the ear cartilage, sparing the tragus, and the earlobe (2). This condition is feared because it most frequently results in a deformed and shriveled pinna, and its treatment is challenging.

Case presentation

A 68-year-old woman with personal antecedents of type II diabetes presented to our clinic with swelling, tenderness, and erythema of the left ear, symptoms that appeared 2 weeks before the hospital admission. From the patient's history,

we also recall a radical left ear mastoidectomy in November 2022, mixed unilateral hearing loss, left facial paralysis (which first debuted before the otic surgery) (Figure 1), and essential arterial hypertension. Although under treatment with two types of insulin, the patient's diabetes was poorly controlled, with daily variations over the higher limit of glycemia.

On physical examination, a fluctuant, red mass of 3/2 cm could be observed on the left ear, and the external acoustic meatus was stenotic due to the swelling. The abscess was incised and a purulent collection of approximately 5 ml was drained from the site. The fluid was sent for culture, and the result came back as non-pathogenic *Staphylococcus aureus*. The patient was tested for allergies to antibiotics, and after confirming the negative result for Cefuroxime at the cutaneous allergy test, empiric intravenous treatment with Cefuroxime as well as anti-algic and anti-inflammatory medication was initiated, simultaneously with daily local treatment consisting of Rivanol, boric acid, or Baneocin powder. After 10 days of hospitalization, because the purulent collection did not stop to drain, the incision at the level of the left pinna was expanded, and after 2 days, the



FIGURE 1 | Image showing the facial asymmetries.



FIGURE 2 | Ameliorated state of the wound incision after 3 weeks of treatment.

local state of the infection began to ameliorate. The systemic treatment with antibiotics was continued for 14 days, and the local treatment was applied daily for 21 days (Figure 2).

Discussion

The main downsides of auricular perichondritis are the difficulty of the treatment and the important deformity

of the external ear that this condition can result in. The most frequent etiologies of this disease, cited in other studies, seem to be iatrogenic (post-operative), burns, and ear trauma (such as ear piercings) (1). *Pseudomonas aeruginosa* and *Staphylococcus aureus* are the most frequently isolated microorganisms in patients with pinna perichondritis. In the absence of a causative infection, the etiology of the disease is usually an immunosuppressed patient. Considering the fact that the infection occurred long after the ear surgery, remembering that the culture came back positive for a non-pathogenic agent, and keeping in mind the amount of time it took for the condition to ameliorate, we can suspect that in our case, the perichondritis was most likely a result of uncontrolled diabetes as well as the lack of proper local hygiene.

Diabetics are seen as a vulnerable group to infections because of their immune deficiency (a cause of the insufficient mechanisms of phagocytosis and chemotaxis) and also because of their diabetic vascular disease (especially microangiopathy in our case) and neuropathy (2). Being so vulnerable, these patients require prompt and aggressive treatment for extended periods of time. The cartilage, being an avascular tissue, derives its nutrition by diffusion from the blood vessels of the perichondrium. However, in our case, this mechanism becomes very difficult, first because of the abscess that dissects the perichondrium from its cartilage, and second because of the already existing diabetic microangiopathy that affects the blood vessels similarly to that observed in the diabetic foot. Left untreated, this condition results in necrotic cartilage, which becomes an ideal environment for bacteria and later leads to auricular deformity, also known as cauliflower ear (3, 4).

Previous studies on patients with auricular perichondritis took into consideration antibiotic treatment, multiple or repeated incision methods, the excision method, tubal drainage, or even ultraviolet therapy as means of managing this acute condition (5).

As for our patient, systemic antibiotic therapy combined with the repeated incision method and local antiseptic treatment proved to be effective, although time-consuming.

Taking into consideration the long hospitalization period and the slow improvement of our patient's status, we searched for new methods of hurrying the person's recovery. Treatment of auricular perichondritis using hyperbaric oxygen therapy (HBOT) has been previously tested and has appeared useful when associated with the already existing therapies for different types of tissue injuries in diabetic patients. HBOT's mechanisms of action are based on the renewal of intracellular oxygen and nitrogen free radicals, which serve as signaling molecules for growth factors, cytokines, and hormones. This results in an increase in the circulating stem cells, which will promote healing (6). Upon discharge from our facility, we advised the patient to undergo

hyperbaric oxygen therapy in a clinic equipped with the necessary technology.

Conclusion

Pinna perichondritis can result in severe deformation of the external ear, having a great impact on the patient's life. Moreover, in the case of vulnerable patients, such as those with diabetes, the prognosis for this condition is much worse than it usually is.

This case of auricular perichondritis in a diabetic patient with signs of poor hygiene represents a challenging condition to cure, suggesting that classic methods such as systemic administration of antibiotics and local treatment could benefit from complementary therapies such as hyperbaric oxygen therapy.

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