Clinico-pathological profile and comparative study of conservative versus surgical deroofing as an effective technique in management of pseudocyst of pinna

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Abstract  Background and objectives: An auricular pseudocyst is not uncommon in routine ENT clinical practice, it occurs when fluid accumulates between the intracartilaginous spaces of the auricle. Many treatment modalities have been proposed such as incision and drainage of the cyst, simple needle aspiration, tight bandaging with dental rolls, however recurrence and cosmetic problems are still noted in some cases. The aim of this article was to discuss our experience of surgical treatment of intractable auricular pseudocysts with marsupialisation, deroofing and anterior cartilage leaflet removal along with compression suture therapy.

Materials and methods: Twenty patients were included in the study conducted at ENT department, Sur Ministry of Health Hospital between January 2012 and January 2014 after prior consent and ethical approval. Those following trauma and other pinna conditions like relapsing polychondritis were excluded from our study. The clinical appearances were noted and all patients underwent surgical deroofing with removal of anterior cartilage leaflet and compression suture therapy using buttons for two weeks.

Results and observations: There were 8 males and 12 females out of the 20 and right sided pinna (n = 14) involvement in the region of the scaphoid fossa (n = 12) was more than the triangular fossa (n = 3) or conchal bowl involvement (n = 5). Mostly patients between 30 and 40 years of age were affected (Mean age of 37 years and standard deviation of 8). The overall success rate with deroofing and compression suture therapy was 98%.

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Introduction

Auricular pseudocyst is not an uncommon condition encountered by primary care physicians and in routine ENT practice. They are asymptomatic cystic swelling with fluid accumulation between the intracartilaginous spaces of the auricle and typically involve the triangular fossa, conchal bowl and scaphoid fossa of the auricle. It is also known as an intracartilaginous cyst, endochondral pseudocyst, and idiopathic cystic chondromalacia. Most pseudocysts of the auricle involve spontaneous swelling without an obvious history of trauma, and aspiration typically produces a viscous straw-yellow colored fluid that resembles olive oil in appearance. Most of the pseudocysts are unilateral and affects mostly the males within mean age group of 35 and 40 years. The differential diagnosis of this condition includes cellulitis, relapsing polychondritis, chondrodermatitis helicis, and subperichondrial hematoma secondary to trauma. The objective of treatment is to preserve the anatomic architecture and prevent recurrence. However, medical treatment and simple aspiration are usually ineffective with high recurrence rates. Without treatment, permanent deformity due to fibrosis and cartilaginous deposition may cause irreparable injury to the pinna such as cauliflower ear. Various treatment modalities have been proposed including incision and drainage, aspiration followed by treatment with intralesional steroids, or who refused further conservative treatment due to unsuccessful aspiration in local extended clinics

Materials and methods

After prior ethical approval from the research committee, explanations given to the patient with their individual informed written consent, this prospective study which was conducted at ENT department in Sur Hospital, Sultanate of Oman between January 2012 and January 2014. We conducted a prospective analysis on 20 patients presenting with auricular pseudocyst in our hospital. These 20 patients were referred from our extended clinics to our secondary care centre and 18 of those who failed repeated aspirations and intralesional steroids for at least 3 occasions, one each who failed 5 intralesional steroid injections and three times simple pseudocyst aspiration were included in our study and those patients with history of pinna swelling following trauma or those presenting with cyst like lesion due to other conditions like relapsing polychondritis, cellulitis and tumour were excluded from our study. Auricular pseudocysts were diagnosed based on clinical examination, aspiration characteristics and absence of inflammation or infection. All 20 patients in our study were unresponsive to aspiration followed by intralesional injections of steroids (triamcinolone, 1 ml of 10 mg/ml suspension, at least three injections) or who refused further conservative treatment due to unsuccessful aspiration in local extended clinics

Results

There were 8 (40%) males and 12 (60%) females out of the 20 and right sided pinna (n = 14, 70%) involvement in the region of the scaphoid fossa (n = 12, 60%) was more than
the triangular fossa ($n = 3$) or conchal bowl involvement ($n = 5$). Mostly patients between 30 and 40 years of age were affected (Mean age = 37 years, Standard deviation = 8). The overall success rate with deroofing and compression suture therapy was 98%. The average duration of the pseudocysts were 3.4 weeks with a lesion size ranging from 2 to 4 cm. Out of the 20 patients, 18 patients had undergone aspiration followed by intraleisonal steroid injections at least 3 times, but ultimately the treatment failed in all cases. One patient received 5 injections of steroids, however the pseudocystic lesions still recurred and another patient who received at least three simple aspirations at local extended ENT clinic requested surgical intervention on his first visit to our outpatient department. All of the patients received the deroofing surgical method to remove the pseudocysts. The histopathology specimens showed cyst-like lesions with a fibrous, cartilaginous and granulation tissue lining but no epithelium. The patients were followed up for 20–25 months without any recurrence. Although three of the patients had the complication of a perichondrial reaction and subcutaneous soft tissue thickening, all of them had a cosmetically acceptable appearance of the pinna after treatment.

| Patient | Age (years) | Gender | Side | Location       | Size (cm) | Duration of Pseudocyst | Intraleisonal steroids injections (times) | Duration of follow up (months) | complication | Recurrence |
|---------|-------------|--------|------|----------------|-----------|------------------------|----------------------------------------|-------------------------------|--------------|------------|
| 1       | 35          | Female | Left | Scaphoid fossa | $1.5 \times 2.0$ | 2.5 weeks | 3                        | 26                           | None          | None        |
| 2       | 62          | Male   | Right | Conchal bowl   | $2.5 \times 3.0$ | 2 weeks    | 3                        | 24                           | None          | None        |
| 3       | 43          | Female | Left | Scaphoid fossa | $2.0 \times 2.0$ | 1.5 months | 4                        | 24                           | None          | None        |
| 4       | 27          | Female | Right | Scaphoid fossa | $2.5 \times 2.0$ | 2 weeks    | 3                        | 24                           | None          | None        |
| 5       | 37          | Male   | Right | Triangular fossa | $2.0 \times 1.5$ | 3 weeks    | 3                        | 24                           | Perichondrial thickening | None        |
| 6       | 33          | Female | Right | Scaphoid fossa | $2.0 \times 3.0$ | 2.4 weeks | 3                        | 28                           | None          | None        |
| 7       | 36          | Female | Left | Scaphoid fossa | $2.0 \times 3.0$ | 2 weeks    | 3                        | 23                           | None          | None        |
| 8       | 32          | Female | Right | Conchal bowl   | $2.5 \times 2.5$ | 3 weeks    | 3                        | 22                           | None          | None        |
| 9       | 31          | Male   | Left | Scaphoid fossa | $2.0 \times 4.0$ | 2 weeks    | 3                        | 20                           | None          | None        |
| 10      | 38          | Female | Right | Triangular fossa | $3.5 \times 3.0$ | 2 months   | 3                        | 24                           | Perichondrial thickening | None        |
| 11      | 53          | Male   | Right | Scaphoid fossa | $3.0 \times 3.0$ | 2 weeks    | 5                        | 24                           | None          | None        |
| 12      | 38          | Male   | Left | Scaphoid fossa | $3.0 \times 2.0$ | 2.5 weeks  | 3                        | 24                           | None          | None        |
| 13      | 34          | Female | Right | Conchal bowl   | $2.0 \times 2.5$ | 2 weeks    | 3                        | 24                           | None          | None        |
| 14      | 40          | Male   | Right | Scaphoid fossa | $2.0 \times 3.0$ | 1.5 month  | 3                        | 24                           | None          | None        |
| 15      | 39          | Female | Right | Scaphoid fossa | $2.0 \times 3.0$ | 2 weeks    | 3                        | 24                           | Soft tissue thickening | None        |
| 16      | 36          | Female | Right | Scaphoid fossa | $2.2 \times 3.0$ | 3 weeks    | 3                        | 24                           | None          | None        |
| 17      | 29          | Male   | Right | Triangular fossa | $3.0 \times 3.0$ | 2.5 weeks  | 3                        | 24                           | None          | None        |
| 18      | 41          | Female | Left | Scaphoid fossa | $3.0 \times 2.0$ | 3 week     | 3                        | 24                           | None          | None        |
| 19      | 29          | Male   | Right | Conchal bowl   | $2.0 \times 2.0$ | 2 month    | 3                        | 24                           | None          | None        |
| 20      | 34          | Female | Right | Conchal bowl   | $2.0 \times 3.0$ | 2 weeks    | 4                        | 25                           | None          | None        |
Pseudocyst of the auricle was first reported by Hartmann in 1846 and first described in the English literature in 1966 by Engel. Because the condition is not uncommon, it may be misdiagnosed or underreported by clinicians. Pseudocyst of the auricle is characterized as a benign, noninflammatory swelling to the ear, located on either the front or side surface. Tan and Hsu reported the epidemiological features, clinico pathologic characteristics, and success of surgical treatment in 40 patients of different Asian groups presenting with pseudocyst of the auricle. Results showed a Chinese predominance (90%), followed by Malays (5%), and Eurasians (5%). All except one patient had unilateral presentations. Most (55%) presented within 2 weeks of auricular swelling. Few (10%) had a history of trauma. Most reports of pseudocyst of the auricle have involved Chinese or white patients; however, persons of all racial groups have been affected. Males show a higher prevalence of pseudocyst of the auricle than females. Most pseudocysts of the auricle are unilateral and occur in men aged 30–40 years, but lesions are documented in patients ranging in age from 15 to 85 years of both sexes. The etiology of pseudocyst of the auricle is unknown, but several pathogenic mechanisms have been proposed. Originally, Engel postulated that lysosomal enzymes might be released from chondrocytes and cause damage to the auricular cartilage. However, analysis of pseudocyst contents revealed a fluid rich in albumin and acid proteoglycans, with a rich cytokine milieu but lacking in lysosomal enzymes. Pseudocysts usually present spontaneously or following repeated minor trauma. The observation that an auricular pseudocyst often results after repeated minor trauma, such as rubbing, minor sport injuries, ear pulling, sleeping on hard pillows, or wearing a motorcycle helmet or earphones, has led to the suggestion that these minor traumas may be the mechanism. In support of this traumatic etiology, elevated serum lactic dehydrogenase (LDH) values have been reported within the pseudocyst fluid. Two of the elevated isoenzymes, LDH-4 and LDH-5, are proposed as major components of human auricular cartilage. These enzymes may be released from auricular cartilage degenerated from repeated minor trauma. Without treatment of pseudocyst of the auricle, permanent deformity of the auricle may occur. The goals of treatment of pseudocyst of the auricle are preservation of anatomical architecture and prevention of recurrence. Without treatment, permanent deformity of the auricle may occur. Treatment options include needle...
aspiration with pressure dressings, medication (either systemic or oral), and surgical care. Consensus on the best management for pseudocyst of the auricle is undetermined, and a combination of treatment modalities may be necessary to achieve optimal resolution. No medical treatment is uniformly effective for pseudocyst of the auricle. High-dose oral corticosteroids and intraleval corticosteroids therapies have been reported, with variable results. Some authors argue against the use of intraleval steroids, implicating them in permanent deformity of the ear, while others support steroid injection therapy or even oral steroid therapy. Advocates of steroid injection therapy consider it a much simpler procedure than surgery. Patigaroo et al found that simple observation as a treatment option was found to be as good as intraleval steroids. Some have used an auricular prosthesis formulated with the creation of a moulage fitted to the ear by the prosthetist for pressure. Several reports describe a combined procedure using surgical incision and drainage of the lesion, replacement of the anterior skin surface, and the application of a pressure dressing or bolster. Surgical curettage and fibrin sealant has been shown to be effective in obliterating the cystic cavity. The fibrin sealant works as a template for fibroblasts to move through the wound and serves as a delivery system for growth factor. It also has hemostatic and antibacterial activity. Intraleval injections of minocycline hydrochloride (1 mg/ml) 2–3 times at 2-week intervals has shown efficacy. Minocycline is thought to work as a sclerosant through its anti-inflammatory and immunomodulatory mechanisms. Other sclerosants used include 1% trichloroacetic acid and tincture of iodine. An alternative to steroids and conventional surgical incision is a simple punch biopsy followed by the application of a bolster for approximately 2 weeks. This method should be a welcome alternative for physicians who choose to not use steroids. This simple alternative method provides a safe and effective mechanism for diagnosis and treatment of this phenomenon, while minimizing the risk of deformity. Successful treatment of an auricular pseudocyst using a surgical bolster is reported in the literature. Shan et al reported success with surgical treatment using plastic sheet compression. One study reported a patient who developed initial perichondritis following excision, requiring treatment with intravenous antibiotics. The perichondritis resolved, but with a resultant cauliflower ear 3 months after the surgery. Authors proposed that since the patient was an elderly woman with diabetes mellitus, the underlying comorbidity may have contributed to the unfavourable outcome. Although this procedure is the best, it is associated with minor complications as seen in our study. Perichondrial reaction and thickening of pinna were the common complications which we noticed. Perichondrial reaction subsided with antibiotics and anti-inflammatory drugs. We did not see any patient with frank perichondritis, the most dreaded complication expected due to the exposure of the perichondrium because we took all possible care to do incision and drainage under aseptic conditions. Proper surgical and postoperative care of the wound can minimize if not prevent most of the complications and hence this procedure can be recommended for treating auricular pseudocysts.

### Conclusion

Auricular pseudocysts are not an uncommon condition affecting middle aged patients without identifiable etiology. Conservative modalities may be the first choice of treatment for auricular pseudocysts although varied recurrence and failure rates have been published in the literature. However, the deroofing surgical technique with anterior cartilage leaflet removal with compression suture therapy is a reliable and easy procedure which can achieve an acceptable appearance of the pinna without recurrence when conservative management fails or is refused by the patient.

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