



ASPIRATION VERSUS SURGICAL DEROOFFING TECHNIQUE IN MANAGEMENT OF PRIMARY PSEUDOCYST OF PINNA: A RANDOMIZED CONTROL STUDY.

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ABSTRACT

Introduction: Pseudocyst or seroma is an uncommon asymptomatic, non-inflammatory swelling of the pinna, characterized by endochondral cyst formation. Pseudocyst commonly occur as a post trauma sequela. The objective of our study is to compare and analyse the outcomes of aspiration and window technique in treating auricular seroma. **Study Design:** Randomized control study. **Setting:** This study comprised of 20 patients who presented with auricular seroma to the Department of ENT, HSK Hospital, Bagalkot from August 2020 to December 2022. **Methods:** The diagnosis of the auricular pseudocyst was made clinically. Out of 20 patients, 10 patients were taken up for wide bore needle aspiration followed by contour pressure dressing, and 10 patients underwent the window procedure. Patients were followed up for a period of 6 months. **Results:** In the 10 cases primarily taken up for needle aspiration, there was a recurrence in 8 out of the 10 cases; while 2 patients showed successful outcome during the 6 months of follow-up. Of the 10 cases taken up primarily for the window procedure, no recurrences were noted as compared to aspiration group, which was statistically significant ($p=0.0003$). **Conclusion:** Considering the rate of success and minimal complications encountered in our study, we would advocate the use of deroofting technique for achieving better outcome in the management of pinna pseudocysts.

KEYWORDS : Pseudocyst of pinna, auricular seroma, simple aspiration, surgical deroofting, window technique.

INTRODUCTION:

Pseudocyst or seroma is an uncommon asymptomatic, non-inflammatory swelling of the pinna, characterized by endochondral cyst formation.¹ Shearing forces are responsible for the building of serous fluid in the subperichondrial space.² Pseudocyst commonly occur as a post trauma sequela.³

Multiple hypothesis has been put forth explaining the seroma formation such as lysosomal degradation of cartilage which is a consequence of a trauma.³ There have been postulates which suggests the gaps in the auricular cartilage tend to open the tissue planes when subjected to repeated minor trauma or mechanical stress, forming a pseudocyst.³

Auricular pseudocysts are seen almost exclusively in men, mostly in those who participate in wrestling or boxing.² The majority of the pseudocysts are unilateral lesions.² In the literature, treatment of this condition varies widely.⁵ Seromas are notorious for recurrence and may need multiple procedures.⁶ These swellings can affect facial aesthetics.⁶ The objective of our study was to compare and analyze the outcomes of aspiration and window technique in treating auricular seroma.

METHODOLOGY:

A. Design of The Study:

Randomized control study.

Sample size and its calculation:

Sample size estimation done using OPENEPI software version 2. With 95% Confidence level, And 80% Power of the study, Sample size was estimated and it was 20.

Inclusion criteria:

- Patients presenting with ear swelling to the outpatient Department of Otorhinolaryngology at HSK Hospital, Bagalkot and clinically diagnosed with auricular seroma.
- No history of any interventions for the current ear swelling done elsewhere.
- Patients between the age group of 15-75 years of both the genders.

Exclusion criteria:

- Patients below the age of 15 and above 75 years.
- Patients with history of prior medical therapy, aspiration or surgical procedures for the seroma of pinna done elsewhere.

B. MATERIALS AND METHODS:

This study was conducted in Department of ENT, HSK Hospital, Bagalkot from August 2020 to December 2022 for a period of two and half years. It was carried out in 20 patients suffering from pseudocyst of pinna. They belonged to the age group of 15-75 years. This study was in accordance with the Ethical Review Committee of SNMC-Institutional ethics committee on human subjects research recognized by Medical council of India and affiliated to RGUHS, Bangalore. Informed consent for participating in the study was obtained from all the patients.

All the patients underwent a detailed clinical examination and a routine haematological examination. Simple randomization was done using computer generated random table using random number 1-20. An odd number will be allotted to group A and even number to group B. 10 patients in group A underwent aspiration and 10 patients in group B were treated by window technique.

The disease process and prognosis were explained to all our patients. They were also informed about the end result and sequelae. Aspiration of the swelling was done using 18 gauge * 1.5 inch wide bore needle under aseptic precautions in the OPD at the most dependent portion of the swelling in order to evacuate the serous fluid, which was followed by pressure dressing. The procedure was repeated at weekly intervals for three consecutive weeks if any recollection of fluid was noted in the first 3 weeks.

Window or de-roofing procedure was done under local anaesthesia with all aseptic precautions. Local infiltration of the auricle using 2% lignocaine with 1: 200,000 adrenaline was given. The incision was made at the maximum bulge of the swelling of the pinna measuring 1.5cms. Skin was gently elevated and the cartilage is exposed. The incision was widened in a square fashion and anterior wall was removed by excising a rectangular piece of cartilage measuring about 1cm x 0.5cm thereby creating a window. The wound was closed

using 3-0 plain catgut with a drain in-situ, followed by pressure dressing. The drain was removed after 2 days and pressure dressing reapplied. Local dressing was done thereafter.

All patients of both groups were put on broad-spectrum antibiotics and analgesics. Patients were regularly followed up for a period of 6 months, initially weekly for the 1st 3 weeks, then they were evaluated monthly once and a note on the recurrence status was made.

Statistical Analysis:

Data was entered in the Microsoft excel and analysed using SPSS software version 19. Percentages & proportions was used for qualitative data and mean and standard deviation for quantitative data. Appropriate statistical test such as Chi-square test was applied. $p < 0.05$ was considered as statistically significant.

OBSERVATION AND RESULTS:

The duration of our study was for a period of almost 2 and a half years. A total of 20 patients presented with pseudocyst of the auricle to our OPD. The age of our patients ranged from 15-75 years. Majority of our patients were in the 3rd and 4th decade of life (Table 1). All 20 patients were males (Table 2).

Table 1: Age distribution

Age group (years)	Number of cases (n=20)	Percentage
15-20	0	0%
21-25	2	10%
26-30	5	25%
31-35	5	25%
36-40	3	15%
41-45	1	5%
46-50	2	10%
51-55	1	5%
56-60	1	5%

Table 2: Gender distribution

Gender	Number of cases (n=20)	Percentage
Male	20	100

The most common presenting feature included a spontaneous painless swelling of pinna of varying duration ranging from 10 days to 2 months. Of the 20 cases, 19 had unilateral disease and 1 was bilateral pinna seroma (Table 3).

Table 3: Characteristics of pseudocyst pinna

Characteristics	Number of patients(n=20)
Colour of fluid:	
Serosanguinous	3
Straw serum	11
Yellow	6
Laterality	
Bilateral	1
Unilateral	19
Right	17
Left	4
Duration of swelling	10 days to 2 months

Site of swelling was noted in the scaphoid fossa, triangular fossa, cymba concha or was diffuse (Table 4).

The main sites of predilection found in our study were the scaphoid fossa, triangular fossa and concha, in decreasing order of their incidence (Figure 1). In 2 cases, there was diffuse collection of fluid involving more than one site of the pinna.

Table 4: Sites of swelling

Site of swelling	Number of cases (n=20)	Percentage
Scaphoid fossa	9	45
Triangular fossa	6	30

Concha	3	15
Diffuse swelling	2	10



Figure 1: Site of swelling.

Size of the swelling ranged from 1.5 to 4 cm. There was no history of trauma or any bleeding diathesis in any of the participants.

Out of 20 patients, 10 patients were taken up for wide bore needle aspiration followed by contour pressure dressing (Figure 2), and 10 patients underwent the window procedure (Figure 3). The selection criteria of treatment of individual cases were based on randomization.

Patients were followed up for a period of 6 months for data collection.



Figure 2: Needle aspiration.

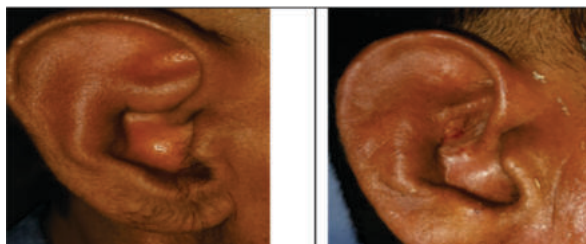


Figure 3: Window procedure.

Of the 10 cases primarily taken up for needle aspiration, there was a recurrence in 8 out of the 10 cases; while 2 patients showed successful outcome during the 6 months of follow-up (Table 5). Of the 10 cases taken up primarily for the window procedure, no recurrences were noted as compared to aspiration group, which was statistically significant ($p=0.0003$). The failure cases of aspiration were taken up for surgical deroofing. Deroofing procedure of auricular seroma was successful in preventing recollection of fluid.

Table 5: Rate of recurrence

Procedure	Number of cases primarily done	Recurrence	Percentage of success
Needle aspiration	10	8	20
Window procedure	10	0	100

Out of the 10 patients, who were treated by needle aspiration, none developed any complications apart from a mild pain over the aspiration site which subsided subsequently. 2 cases in group B developed perichondrial reaction with pain and inflammation of the auricle during the post-operative period (Table 6). They responded well to antibiotic course and analgesics. Among the 10 cases, mild thickening of the auricle

at the site of incision was noticed in 8 cases, which persisted during the follow up visits. In this series, no incidence of recurrence, alteration in the shape of the pinna or marked perichondritis was noted.

Table 6: Sequelae

Sequelae	Procedure	
	Needle aspiration	Window technique
Recurrence	8	0
Redness/tenderness/erythema of pinna	0	2
Thickening of the pinna	0	8
Deformity of the pinna	0	0

On comparison with deroofting technique, aspiration procedure was less invasive as well as less time consuming. It was also cost-effective. But it resulted in recurrences. All the 8 failure cases of aspiration were taken up for surgical deroofting. Our patients responded well to surgical deroofting. From this study, we have come to the conclusion that surgical deroofting is an effective treatment option for seroma of the pinna.

DISCUSSION:

Engel was the first to describe the condition as "auricular pseudocyst".⁴ Various terms for this condition are endochondral pseudocyst, intracartilaginous auricular seroma cyst, cystic chondromalacia and benign idiopathic cystic chondromalacia.⁴ It occurs due to accumulation of fluid between perichondrium and cartilage and does not have an epithelial lining.⁶ Clinically, this condition presents as a painless, prominent, fluctuant swelling on the upper anterior surface of the auricle.⁵ It commonly develops in the anterolateral aspect of the pinna.⁶

The aetiology of this condition is unknown but at the same time many investigators believe that repeated minor injuries were responsible for the formation of pseudocysts, particularly in patients with pre-existing congenital intracartilaginous defects associated with lymphatic and vascular channels, while some believe that the cause is cartilaginous degeneration caused by the release of chondrocyte lysosomal enzymes.⁴

This condition commonly affects males, within the age group of 30-40 years.⁷ The swelling commonly ranges from 1-5cms in diameter, containing clear serous fluid.⁷ It typically involves the scaphoid fossa, triangular fossa of the anti-helix and the cymba concha.⁸ The condition has high incidence of recurrence following inadequate or inappropriate treatment.⁸

Possible differential diagnosis of auricular seroma includes chondrodermatitis helices, sub perichondrial haematoma and relapsing perichondritis but this can usually be distinguished from clinical features.⁹ The characteristic histological features of an auricular pseudocyst will reveal an intercartilaginous cystic space with no epithelial lining, in contrast to other auricular conditions that are subperichondrial in nature.⁹ There is often some granulation tissue partly lining the cystic space with minimal inflammatory cells.⁹

Over the years several methods of treatment have been advocated, such as repeated aspiration combined with physiotherapy, incision and drainage with contour pressure dressing, magnetotherapy, insertion of drainage tubes, excision and BTTP impregnated packing, injection of one percent tincture of iodine, oral steroids etc.¹⁰

Incisional drainage or needle aspiration followed by a compressive dressing is one of the most commonly applied methods but, this method of treatment has high recurrence

rates.⁵ Chemical or mechanical obliteration of the cavity is necessary for a successful treatment as reported in the previous studies.⁵

Oral corticosteroid alone has been tried by Job et al and they report a successful outcome.¹¹ Studies with the use of fibrin glue and minocycline as a sclerosing agent are difficult to interpret as these observations were made in a few patients and also these agents are not readily available in all places.¹¹

The most commonly employed treatment is aspiration of fluid followed by injection of various substances like steroids (Juan 1994), 50% Trichloro acetic acid (Cohen et al 1991), Triamcinolone (Young 1991) etc.⁸ However, the results of this method is variable and often result in recurrences or auricular deformity (Miyamoto et al 1994).⁸ Lim et al. in their series found that none of the patients had recurrence following excision and compression buttoning of the pseudocyst.⁴

Window operation which involves excision of a small piece of cartilage is the most widely accepted modality of treatment.⁶ The window process has many advantages such as; it avoids repeated drainage and pain, ensures complete drainage, prevents recollection, cosmetic and no perichondritis.⁷

Choi et al, performed a procedure in which the pseudocyst was effectively de-roofed by excision of the anterior wall of the cyst.¹⁰ The majority of cases they treated by this procedure were successful with minimal complications of perichondritis, residual thickening and deformity of the pinna.¹⁰

In study by Hoffman et al, surgery involving excision of the anterior cartilage of the ear and compression buttoning of the pseudocyst was done.¹² However, excision has been reported to lead to cauliflower and floppy ear deformities.¹²

Patigaroo et al¹³ found no recurrence with surgical deroofting and buttoning. Although this procedure is the best, it was associated with minor complications such as perichondrial reaction and thickening of the pinna.¹³

20 cases of pseudocyst of the auricle were seen in our outpatient department over a time period from August 2020 to December 2022. Our study also included the age-sex distribution and site of involvement.

Most of the studies showed a higher prevalence in males, such as the study by Kantora et al.¹⁴ In the present study, all patients included were males. The study by Wang et al, the average age was 43.8 years old.¹⁵ In the present study, majority of them ranged between 20 to 40 years in age.

Tan et al documented a higher incidence of pseudocysts in the right ear than in the left ear, with a ratio of 1.8:1.¹⁶ However, in another study, the incidence of pseudocysts in the right ear and in the left ear were equal (1:1).¹⁵ In our study, the occurrence of pseudocysts was mostly noted on the right pinna., which was mentioned by most of the patients in the study. The higher incidence in the right ear might be correlated with the habit of sleeping on the right side.

Kantora et al documented a higher incidence of auricular pseudocysts in the concha fossa (72.1%), while Choi et al found a higher incidence in the scaphoid fossa (80.6%).¹⁴ In the current study, majority of our patients developed swelling of scaphoid fossa of the pinna (45%).

The aim of treatment of auricular pseudocyst is to regain the normal anatomic morphology of the pinna and to prevent recurrence. Aspiration has shown rather disheartening end result with only 2 of 10 cases showing good response. It was associated with high recurrence in our study. There are several

causes for the recurrence of auricular pseudocyst, including incomplete disruption of the cyst wall, residual fluid and partial adhesion between the cyst walls.¹⁷

The other procedure employed in this study, that is window or de-roofing operation, had a 100% success rate with all cases resulting in positive outcome as evident by the resolution of the swelling. The cavity healed by granulation tissue formation. The complications encountered with this technique were perichondral reaction, which was seen in 2 patients and which resolved with further treatment. Perichondritis is the most dreaded complication to the exposure of the perichondrium which was absent in our patients. This implies the fact that proper care of the wound can markedly reduce the complications.

The clinical findings suggest that surgical deroofing is more effective than aspiration technique for treating auricular pseudocysts. Considering the rate of success and minimal complications encountered in our study, we would advocate the use of deroofing technique for achieving better outcome in the management of pinna pseudocysts. One of the main limitations of our study was the smaller sample of patients; and more participants should be analysed to further verify the effectiveness of the treatment modality.

CONCLUSION:

Management of pseudocyst of pinna can be a challenging task for the treating surgeon. There are numerous modalities of treatment for pseudocyst of pinna but not a single one has been found satisfactory. Recurrence is the main concern in dealing with seroma. On the basis of the results of this study, we would like to conclude that deroofing technique could be considered as the treatment of choice of this rare condition.

Declarations

Ethical standards was in accordance with Ethical Review Committee of SNMC-Institutional ethics committee on human subjects research recognized by Medical council of India and affiliated to RGUHS, Bangalore.

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Conflict of interests:

None

Author contributions

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Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Consent for publication

All participants consent for publication.

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