

COMPARATIVE STUDY BETWEEN VARIOUS SURGICAL MODALITIES FOR ENCHONDRAL PSEUDOCYST OF EAR PINNA AT A TERTIARY CARE CENTER OF JHARKHAND.

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Abstract

Enchondral Pseudocyst or Auricular pseudocyst, a benign condition characterized by non-inflammatory fluid accumulation within the ear cartilage, often presents a challenge due to its high recurrence rates. This study evaluated the efficacy of three surgical management techniques—incision and drainage (I&D) with pressure dressing, I&D with button suturing, and I&D with drain placement—in treating auricular pseudocysts. A total of 15 patients were divided into three groups, each undergoing one of the aforementioned techniques. The study assessed outcomes based on recurrence, fibrosis, and associated complications. Results revealed distinct differences in outcomes across the groups. I&D with pressure dressing had the poorest results, with a 100% recurrence rate and significant fibrosis in all cases. I&D with button suturing showed moderate efficacy, with a 42.8% recurrence rate; however, complications such as skin necrosis were noted, affecting the overall success of the method. In contrast, I&D with drain placement demonstrated the best outcomes, with a recurrence rate of only 14.3% and no cases of fibrosis or major complications, although one recurrence occurred due to drain displacement. This study highlights that I&D with drain placement is the most effective and reliable surgical method for managing auricular pseudocysts. It minimizes recurrence and fibrosis, offering superior long-term results compared to alternative techniques. These findings emphasize the importance of selecting appropriate surgical methods to reduce complications and improve patient outcomes. Further studies with larger cohorts and extended follow-up periods are recommended to confirm these findings and establish a standardized treatment protocol for auricular pseudocysts.

INTRODUCTION

Enchondral pseudocyst of the ear pinna, also referred to as seroma, cystic chondromalacia, intra-cartilaginous cyst, or simply auricular pseudocyst, is a rare, benign, and cystic condition. It is typically asymptomatic and presents without signs of inflammation. Although it can occur anywhere on the pinna, the scaphoid fossa is the most common site of involvement.^[1]

This condition exhibits no genetic predisposition,^[2] and predominantly occurs unilaterally.^[3,4] The size of the pseudocyst usually ranges from 1 to 5 cm in diameter and contains a viscous, straw-yellow fluid; in some cases, a clear pale-yellow fluid has also been reported.^[3]

A notable male predominance has been reported in the literature, attributed to the differential effects of oestrogen and testosterone on cytokine induction, particularly interleukin-1 (IL-1). IL-1 is a critical mediator of inflammation and cartilage degradation and stimulates the production of interleukin-6 (IL-6), which in turn promotes chondrocyte proliferation. Analysis of fluid aspirated from auricular seromas demonstrated significantly elevated IL-6 levels along with increased serum lactate dehydrogenase (LDH) values, providing evidence for a traumatic aetiology.^[5,6]

Further studies have identified lactate dehydrogenase isoenzymes LDH-4 and LDH-5 as major components of auricular cartilage. These isoenzymes are released following cartilage degeneration induced by repeated minor trauma, including activities such as rubbing,

ear pulling, sleeping on hard surfaces, or using helmets and earphones.^[5] This association underscores the role of trauma in the pathogenesis of auricular pseudocyst and highlights its benign yet distinct clinical characteristics.

Auricular pseudocyst is primarily diagnosed based on clinical findings, with its characteristic presentation aiding in differentiation from other conditions. Over the years, various medical and surgical treatment modalities have been attempted, but medical management has demonstrated limited efficacy. Recurrence and fibrosis remain the most common and challenging complications encountered in clinical practice, contributing to patient morbidity and dissatisfaction.

Given the high recurrence rates and suboptimal outcomes associated with existing management approaches, there is a pressing need for further research to develop more effective and reliable treatment strategies.

Aims and objective

To compare and establish an effective, reliable, and cost-efficient treatment strategy for the management of enchondral pseudocyst of the ear pinna.

MATERIALS AND METHODS

15 patients arrived in the department of ENT, RIMS, Ranchi in one-year duration between November 2023 and November 2024. All were selected after routine blood workup, which included CBC, Serology (HIV I & II, HBsAg, Anti HCV), BT-CT & PT-INR. All 15 patients were male aged between 25 to 42 years. A written and informed consent was taken from all of them before the procedure.

Inclusion Criteria

- All patients with clinically diagnosed auricular seroma coming to ENT OPD of RIMS, Ranchi between November 2023 to November 2024.

Exclusion Criteria

- HIV I or II / HBsAg / Anti HCV reactive patients
- RBS more than 140 mg/dl
- INR more than 3.0
- Hb less than 8 g%
- Platelet count less than 50,000 cells/cu.mm

Operative procedures

All procedures were conducted in the ENT operating theatre (ENT-OT) at RIMS, Ranchi, under local anaesthesia using 2% lignocaine combined with adrenaline (1:200,000). Strict aseptic precautions were maintained throughout. Patients underwent one of three types of procedures, with the specific procedure for each patient determined randomly.

Procedure 1: Incision & Drainage followed by Pressure dressing

The procedure was performed under local anaesthesia (LA) with strict aseptic precautions. Patients were positioned supine with the head turned toward the unaffected ear. Prior to the procedure, 3 ml intramuscular diclofenac sodium (25mg/ml) was

administered for analgesia. Following proper painting and draping, local anaesthetic was infiltrated at the incision site. A 0.3–0.5 cm incision was made at the most fluctuant and dependent area using a No. 11 surgical blade. The aspirated fluid was collected and sent for microbiological analysis. A tight dressing was applied using an elastic adhesive bandage. Postoperatively, patients were prescribed ciprofloxacin 500 mg twice daily to prevent perichondritis. Patients were recalled after one week to assess for fluid recollection or signs of infection and again on post-operative day 15 for follow up. The same procedure was repeated consistently across all cases.

Procedure 2: Incision & Drainage followed by button suturing

The procedure was conducted under local anaesthesia (LA) with strict aseptic precautions. Patients were positioned in a supine position with the head turned toward the unaffected ear. 3 ml intramuscular diclofenac sodium (25mg/ml) was administered prior to the procedure for analgesia. After proper painting and draping, local anaesthetic was infiltrated at the incision site. A 0.3–0.5 cm incision was made at the most fluctuant and dependent area using a No. 11 surgical blade. The fluid was aspirated and sent for microbiological analysis. Two sterile buttons of appropriate size were utilized; one button was sutured onto the anterior surface and the other onto the posterior surface of the affected ear pinna using 2-0 silk sutures. A light dressing was applied over the site. Patients were recalled after one week to monitor for button slippage, skin colour changes, fluid recollection, fibrosis, or signs of infection. Postoperatively, ciprofloxacin 500 mg was prescribed twice daily to prevent perichondritis. For follow up they were called again on POD-15.

Procedure 3: Incision & Drainage followed by Drain placement

The procedure was performed under local anaesthesia (LA) with strict aseptic precautions. Patients were positioned supine with the head turned toward the unaffected ear. For pre-procedural analgesia, 3 ml intramuscular diclofenac sodium (25mg/ml) was administered. Following aseptic preparation with appropriate painting and draping, local anaesthetic infiltration was performed at the planned incision site. A 0.3–0.5 cm incision was made at the most fluctuant and dependent area using a No. 11 surgical blade. The aspirated fluid was collected and sent for microbiological analysis. The cystic cavity was irrigated thoroughly with povidone-iodine solution, followed by a saline wash. A sterile drain fashioned from an intravenous (IV) line was inserted into the cavity, ensuring one end remained securely within the cyst and the other directed downward to facilitate drainage by gravity. To prevent fluid accumulation in the external auditory canal, a sterile gauze wick was placed within the canal. A thick gauze pad was applied over the area to absorb any reaccumulated fluid, and a light dressing was performed. Patients were reviewed every

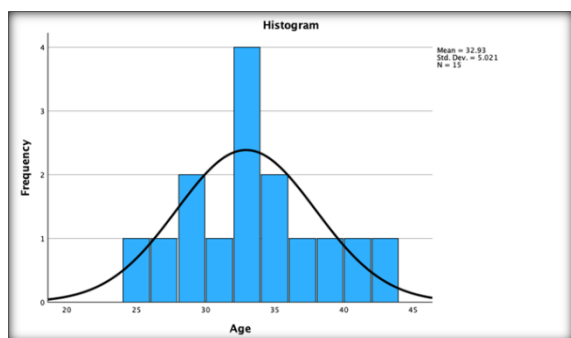
alternate day for one week. During these follow-ups, the drain was cleaned, and the cystic cavity was irrigated with povidone-iodine solution followed by saline. The dressing was replaced in a similar manner. After one week, the drain was removed, and a pressure dressing was applied for an additional day before being discontinued. Patients were reevaluated on POD -15 to assess for recurrence or fibrosis. Postoperative care included a prescription of ciprofloxacin 500 mg twice daily to prevent perichondritis.

This protocol ensured effective management and minimized the risk of complications or recurrence.

Statistical Analysis

Statistical analysis was performed using IBM SPSS version 30.0.0. Fischer Exact test used to compare the types of surgical procedures performed and recurrence and/or fibrosis as their complications. A p-value ≤ 0.05 was considered statistically significant.

RESULTS



A total of 15 patients were included in the study, with a mean age of 32.9 ± 5 years.

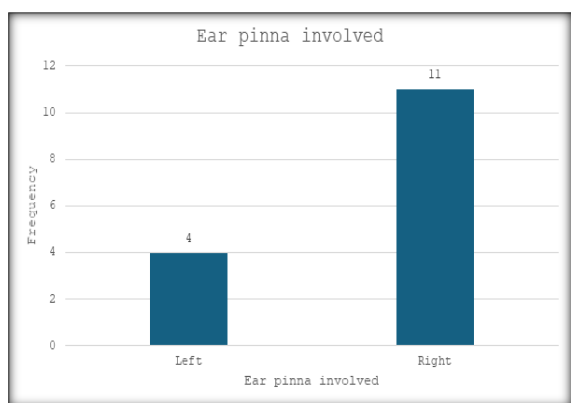


Figure 1: Laterality of Ear Pinna involvement.

As found in our study, out of 15, 11 (73.3 %) patients had auricular seroma in right ear, while 4 (26.7%) had the same in left ear.

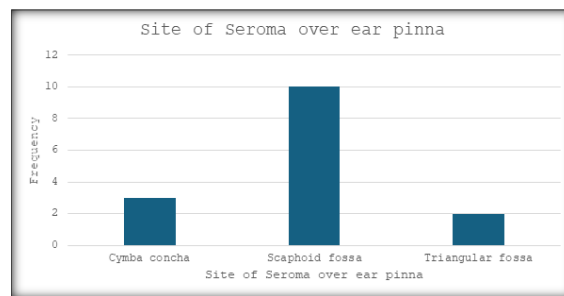


Figure 2: Site of Seroma over ear pinna.

As found in our study, site of occurrence of seroma over the pinna is Scaphoid fossa (66.7%), Cymba Concha (20 %) and Triangular fossa (13.3%) in descending order.

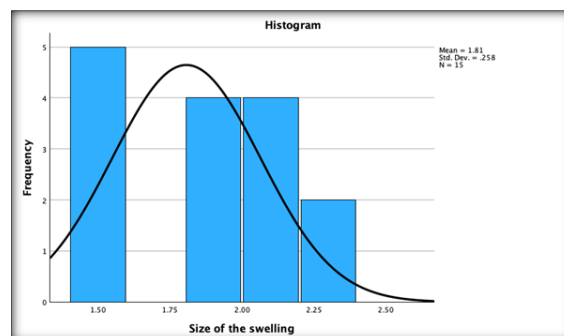


Figure 3: Size of the Swelling.

So, the average size of swelling in our study is 1.8 ± 0.26 cm.

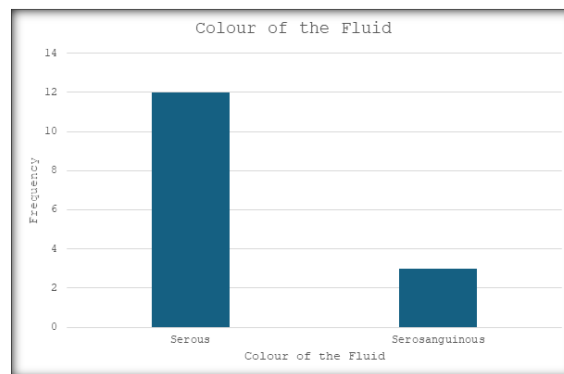


Figure 4: Colour of the aspirated fluid.

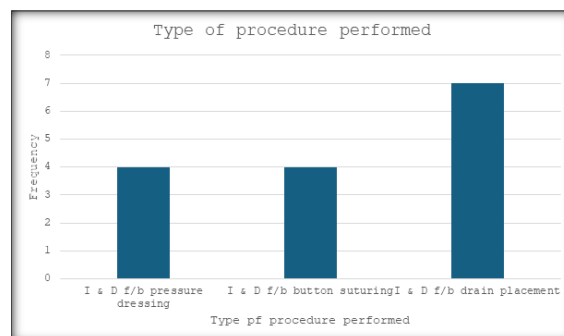


Figure 5: Type of procedures performed.

Finding

Table 1:

Age (in years)		
N	Valid	15
	Missing	0
Mean		32.93
Median		33.00
Std. Deviation		5.021
Range		17
Minimum		25
Maximum		42
Percentiles	25	28.00
	50	33.00
	75	37.00

Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	15	100.0	100.0	100.0

Laterality					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Unilateral	15	100.0	100.0	100.0

All patients included in the study were male and presented with unilateral involvement.

Ear pinna involved					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Left	4	26.7	26.7	26.7
	Right	11	73.3	73.3	100.0
	Total	15	100.0	100.0	

Site of Seroma over ear pinna					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Cymba concha	3	20.0	20.0	20.0
	Scaphoid fossa	10	66.7	66.7	86.7
	Triangular fossa	2	13.3	13.3	100.0
	Total	15	100.0	100.0	

Size of the swelling (in cms)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.50	5	33.3	33.3	33.3
	1.80	4	26.7	26.7	60.0
	2.00	4	26.7	26.7	86.7
	2.20	2	13.3	13.3	100.0
	Total	15	100.0	100.0	

Statistics		
Size of the swelling		
N	Valid	15
	Missing	0
Mean		1.8067
Median		1.8000
Std. Deviation		.25765
Range		.70
Minimum		1.50
Maximum		2.20
Percentiles	25	1.5000
	50	1.8000
	75	2.0000

Colour of the Fluid					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Seros/ Viscous yellow	12	80.0	80.0	80.0
	Serosanguinous	3	20.0	20.0	100.0
	Total	15	100.0	100.0	

Microbiological analysis					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No growth	15	100.0	100.0	100.0

Type of procedure performed					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I & D f/b pressure dressing	4	26.7	26.7	26.7
	I & D f/b button suturing	4	26.7	26.7	53.3
	I & D f/b drain placement	7	46.7	46.7	100.0
	Total	15	100.0	100.0	

Recurrence as complication after one week					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	8	53.3	53.3	53.3
	Yes	7	46.7	46.7	100.0
	Total	15	100.0	100.0	

Fibrosis as complication after 15 days					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	8	53.3	53.3	53.3
	Yes	7	46.7	46.7	100.0
	Total	15	100.0	100.0	

In our study, incision and drainage (I&D) followed by pressure dressing was performed on 4 patients (26.7%). All of these patients experienced recurrence of seroma one week postoperatively, and fibrosis was observed in all cases by 15 days postoperatively.

I&D followed by button suturing was also performed on 4 patients (26.7%). Among these, seroma recurred in 2 patients (50%) within one week postoperatively, and fibrosis occurred in 3 patients (75%). Notably, one patient who appeared fine on postoperative day 7 (POD-7) subsequently developed fibrosis after one week. Skin blackening was also observed to some extent in these patients.

I&D followed by drain placement was performed on 7 patients (46.7%). Recurrence was observed in only one patient, which was attributed to drain displacement leading to closure of the incision site. Importantly, no fibrosis was noted in any of these patients.

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Type of procedure performed * Recurrence as complication	15	100.0%	0	0.0%	15	100.0%
Type of procedure performed * Fibrosis as complication	15	100.0%	0	0.0%	15	100.0%

Type of procedure performed * Recurrence as complication

Crosstab				
Count				
		Recurrence as complication		Total
		No	Yes	
Type of procedure performed	I & D f/b pressure dressing	0 _a	4 _b	4
	I & D f/b button suturing	2 _a	2 _a	4
	I & D f/b drain placement	6 _a	1 _b	7
Total		8	7	15

Each subscript letter denotes a subset of Recurrence as complication categories whose column proportions do not differ significantly from each other at the .05 level.

Chi-Square Tests				
	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	7.538 ^a	2	.023	.034
Likelihood Ratio	9.441	2	.009	.034
Fisher-Freeman-Halton Exact Test	7.159			.034
N of Valid Cases	15			

a. 6 cells (100.0%) have expected count less than 5. The minimum expected count is 1.87.

Type of procedure performed * Fibrosis as complication

Crosstab				
Count				
		Fibrosis as complication		Total
		No	Yes	
Type of procedure performed	I & D f/b pressure dressing	0 _a	4 _b	4
	I & D f/b button suturing	1 _a	3 _a	4
	I & D f/b drain placement	7 _a	0 _b	7
Total		8	7	15

Each subscript letter denotes a subset of Fibrosis as complication categories whose column proportions do not differ significantly from each other at the .05 level.

Chi-Square Tests				
	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	11.987 ^a	2	.002	.001
Likelihood Ratio	16.229	2	<.001	.001
Fisher-Exact Test	11.862			.001
N of Valid Cases	15			

a. 6 cells (100.0%) have expected count less than 5. The minimum expected count is 1.87.

The p-values for recurrence and fibrosis were found to be 0.034 and 0.001, respectively, both of which are less than 0.05. This indicates that the null hypothesis—that all procedures produce similar outcomes—can be rejected. Therefore, the differences in outcomes among the procedures are statistically significant.

DISCUSSION

Auricular pseudocyst was first described by Engel in 1966 in a study involving the Chinese population and white men. The condition demonstrated a marked male predominance, with 84.2% of the cases occurring in males and 15.8% in females.^[7] The pseudocyst of the pinna was first reported in the literature by Hartmann.^[8]

Pseudocyst of the pinna predominantly presents as a unilateral lesion, with the majority of cases occurring in males, typically within the mean age range of 35–40 years. The male predominance is attributed to the hormonal influence on the modulation of inflammation.^[9,10]

In our study, the mean age of affected patients was 32.9 ± 5 years. All patients were male with unilateral presentation.

A study conducted by Ramdas et al. reported that pseudocyst of the pinna typically involves the scaphoid fossa, triangular fossa of the antihelix, and cymba concha, in descending order of frequency.^[3]

In our study site of occurrence of seroma over the pinna is Scaphoid fossa (66.7%), Cymba Concha (20%) and Triangular fossa (13.3%) in descending order. In the same study conducted by Ramdas et al. the size of the pseudocyst typically ranges from 1 to 5 cm in diameter and is filled with a viscous, straw-yellow fluid. In some cases, the fluid may appear as a clear, pale yellow.^[3]

A similar study by Cohen et al. found that pseudocysts of the pinna predominantly contained a straw-yellow, olive oil-like viscous fluid. In a few cases, the fluid was noted to be serous or serosanguinous.^[11] In our study the fluid aspirated out from the cystic swelling was mostly serous or viscous yellow (80%) while in 20% of the cases it was serosanguinous.

A study conducted by Khan et al. found that the aspirated fluid from pseudocysts of the pinna was sterile in all cases.^[12] In our study after microbiological analysis all the samples were found to be sterile with no growth.

The diagnosis of pseudocyst of the pinna is primarily based on clinical characteristics, with no evidence of infection being a key feature. A wide range of treatment modalities has been described in the literature for managing this condition. These include medical management options such as minimally

invasive intralesional steroid therapy, intralesional sclerosant therapy, and intralesional injections of minocycline hydrochloride (1 mg/mL), administered two to three times at intervals of two weeks.^[13]

The surgical management of pseudocyst of the pinna includes various techniques, such as needle aspiration with bolstered pressure sutures applied on both surfaces of the pseudocyst, aspiration with pressure dressing,^[13] incision and drainage with mastoid dressing, surgical de-roofing with the buttoning technique,^[14] quilting sutures with a corrugated rubber drain, cartilage curettage with drainage tube placement, incision and drainage with curettage and pressure dressing,^[15] surgical curettage with fibrin sealant to obliterate the cystic cavity,^[16] and the cartilage window procedure.^[17]

Despite the availability of multiple treatment options, no single approach is regarded as the gold standard. Less invasive methods are often associated with higher rates of recurrence, whereas more invasive procedures carry a greater risk of complications.

In our study we performed three types of procedures on 15 different patients. Different surgical approaches were evaluated for the management of pseudocyst of the pinna. Incision and drainage (I&D) followed by pressure dressing was performed in 4 patients (26.7%). However, all of these patients experienced recurrence of seroma one week postoperatively, and fibrosis was observed in all cases by 15 days postoperatively.

A similar procedure, I&D followed by button suturing, was performed in another group of 4 patients (26.7%). Of these, 50% (2 patients) experienced seroma recurrence within one week postoperatively, and 75% (3 patients) developed fibrosis. Notably, one patient who initially appeared fine on postoperative day 7 (POD-7) later developed fibrosis after one week. Additionally, some degree of skin blackening was noted in these patients, suggesting potential complications associated with this approach.

In contrast, I&D followed by drain placement was performed in 7 patients (46.7%), and this approach showed relatively favourable outcomes. Only one patient experienced recurrence, which was attributed to drain displacement leading to closure of the incision site. Importantly, no fibrosis was noted in any of the patients who underwent this procedure.

These findings highlight the varied outcomes of different surgical management strategies for pseudocyst of the pinna. While pressure dressing and button suturing led to higher rates of recurrence and fibrosis, the drain placement technique showed better outcomes, with a lower incidence of recurrence and no observed fibrosis.

CONCLUSION

Auricular pseudocyst, a benign condition predominantly affecting young males, presents with serous or viscous fluid accumulation in the ear's cartilage. This study compared the effectiveness of three surgical management techniques, namely, incision and drainage (I&D) with pressure dressing, I&D with button suturing, and I&D with drain placement in a cohort of 15 patients. Outcomes revealed significant differences in recurrence and fibrosis rates among the methods. I&D with pressure dressing showed the poorest results, with 100% recurrence and fibrosis, while I&D with button suturing had moderate success but was associated with complications like skin necrosis. In contrast, I&D with drain placement emerged as the most effective approach, yielding the lowest recurrence (14.3%) and no cases of fibrosis, though a single case of recurrence was attributed to drain displacement. These findings suggest that I&D with drain placement should be the preferred surgical treatment for auricular pseudocyst, given its cost effectiveness, superior efficacy and reduced complication rates. This technique minimizes recurrence and fibrosis, offering a durable solution for this recurrent condition. Further research with larger sample sizes and longer follow-ups is recommended to confirm these outcomes and refine surgical protocols.

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Conflict of Interest declaration statement

The authors declare that they have no conflicts of interest related to this study. No funding, sponsorship, or financial support was received from any external organizations or parties that could influence the study's design, execution, or interpretation of the results. Additionally, there are no personal or professional relationships that could be perceived as conflicts in the context of this research on the surgical management of auricular pseudocysts

REFERENCES

1. Shirsath H, Jain S. Seroma of Auricle. *Cureus*. 2022 Nov 7;14(11): e31200. doi: 10.7759/cureus.31200. PMID: 36505133; PMCID: PMC9728624.
2. Patigaroo SA, Mehfooz N, Patigaroo FA, Kirmani MH, Waheed A, Bhat S. Clinical characteristics and comparative study of different modalities of treatment of pseudocyst pinna. *Eur Arch Otorhinolaryngol*. 2012; 269:1747–1754. doi: 10.1007/s00405-011-1805-6.
3. Ramadass T, Ayyaswamy G. Indian J Otolaryngol Head Neck Surg. Pseudocyst of auricle - etiopathogenesis, treatment update and literature review. 2006; 58:156–159. doi: 10.1007/BF03050773.
4. Tan BY, Hsu PP. Auricular pseudocyst in the tropics: a multi-racial Singapore experience. *J Laryngol Otol*. 2004; 118:185–188. doi: 10.1258/002221504322927937.
5. Singh D, Goswami R, Dudeja V. Management of Auricular Pseudocyst: A Comparative Study. *International Journal of Medical Research and Review*. 2014;2(5):457-62
6. Miyamoto H, Okajima M, Takahashi I. Lactate dehydrogenase isozymes in and intralesional steroid injection therapy for pseudocyst of the auricle. *Int J Dermatol*. 2001;40(6):380-4.
7. Engel D. Pseudocyst of the auricle in Chinese. *Arch Otolaryngol*. 1966; 83:197–202. doi: 10.1001/archotol.1966.00760020199003.
8. Hartmann A. Uber Cystenbildung in der Ohrenmuschel. *Arch Ohren Nasen Kehlkopfheilkd*. 1846; 15:156–166.
9. Yamamoto T, Yokoyama A, Umeda T. Cytokine profile of bilateral pseudocyst of the auricle. *Acta Derm Venereol*. 1996; 76:92–93. doi: 10.2340/00015555769192
10. Posma E, Moes H, Heineman M, Faas M. The effect of testosterone on cytokine production in the specific and non-specific immune response. *Am J Reprod Immunol*. 2004;52(4):237–243. doi: 10.1111/j.1600-0897.2004.00216.x
11. Cohen PR, Grossman ME. Pseudocyst of the auricle: case report and world literature review. *Otolaryngol Head Neck Surg*. 1990; 116:1202–1204. doi: 10.1001/archotol.1990.01870100096021
12. Khan NA, Ul Islam M, Ur Rehman A, Ahmad S. Pseudocyst of pinna and its treatment with surgical Deroofi ng: an experience at tertiary hospitals. *J Surg Tech Case Rep*. 2013; 5:72–77. doi: 10.4103/2006-8808.128728.
13. Oyama N, Satoh M, Iwatsuki K, Kaneko F. Treatment of recurrent auriclepseudocyst with intralesional injection of minocycline: a report of two cases. *J Am Acad Dermatol*. 2001; 45:554–556. doi: 10.1067/mjd.2001.116218.
14. Kanotra SP, Lateef M. Pseudocyst of pinna: a recurrence ree approach. *Am J Otolaryngol*. 2009; 30:73–79. doi: 10.1016/j.amjoto.2008.02.008.
15. Hansen JE. Pseudocyst of the auricle in Caucasians. *Arch Otolaryngol*. 1967; 85:1–13. doi: 10.1001/archotol.1967.00760040015005.
16. Karabulut H, Acar B, Selcuk K. Treatment of the nontraumatic auricula pseudocyst with aspiration and intralesional steroid injection. *New J Med*. 2009; 26:117–119.
17. Bhat VS, Shilpa N, Ks R. Deroofing of auricular pseudocyst: our Experience. *J Clin Diagn Res*. 2014;8(10):KC05–KC07. doi: 10.7860/JCDR/2014/9609.4978.