

## Is Supra Auricular Approach Better Than Simple Sinusectomy In Treating Pre Auricular Sinus? Our Experience in a Tertiary Care Hospital

Dr Tithi Debnath<sup>1</sup>, Dr. Subhadeep Chowdhury<sup>2</sup>, Dr. Sweta Verma<sup>3</sup>

<sup>1</sup>(Department of Otorhinolaryngology and Head & Neck Surgery. R.G.Kar Medical College & Hospital, Kolkata)

<sup>2</sup>(Department of Otorhinolaryngology and Head & Neck Surgery. R.G.Kar Medical College & Hospital, Kolkata)

<sup>3</sup>(Department of Otorhinolaryngology and Head & Neck Surgery. R.G.Kar Medical College & Hospital, Kolkata)

Corresponding Author: Dr Sweta Verma

### Abstract:

**Background:** Preauricular sinus is an epithelial tract, skin lined blind ended sinus formed due to faulty union of hillocks of 1st and 2nd branchial arches during development of pinna. It may get repeatedly infected and presents with painful swelling and purulent discharge. The tract is prone to recurrence if it is not excised completely.

### Aims and Objectives

To compare outcome and efficacy of the pre auricular sinus excision by classical simple sinusectomy and by supra-auricular approach.

### Materials and Methods:

Between June 2018 to September 2019, 46 patients with symptomatic pre auricular sinus underwent surgical excision and followed up for at least 6 months at a tertiary care hospital in Eastern India. Patients were categorized into 2 groups.

Group A: Preauricular sinus was excised by classical simple sinusectomy using methylene blue dye along with probing and dissect and excise the sinus tract

Group B: Preauricular sinus was excised by the supra-auricular approach.

**Results:** Excision of 46 preauricular sinuses carried out. Out of them 7 patients were lost to follow up. It was more common in female and between 11-20 years of age group. Right side was predominantly affected. 79.49% were indicated for surgery because of history of repeated infection and discharge from the sinus and 20.51% underwent surgery secondary to swelling at the preauricular region. Majority of patients had recurrent ear discharge (79.49%) ear itching (64.10%) and ear pain (41.02%) as presenting symptoms. The overall recurrence rate is 23.08% (9 out of 39). The simple sinusectomy has the recurrence rate 36.84% (7 out of 19) whereas supra auricular approach has recurrence rate 10% (2 out of 20) with significant difference ( $p=0.0476$ ). Of the sinusectomy approach cases, there were 1 dehiscence wound (5.27%), 3 infections (15.79%), 4 bad scars (21.05%) documented, whereas only 2 operated preauricular sinus (10%) by supra-auricular approach reported infection with no scar or wound dehiscence.

**Conclusion:** Supra auricular approach offers the most favorable outcome for the management of the pre auricular sinus

**Key Word:** Pre Auricular Sinus. Simple Sinusectomy, Supra Auricular Approach, Recurrence

Date of Submission: 20-12-2020

Date of Acceptance: 03-01-2021

### I. Introduction

Preauricular sinus is a congenital malformation first described by Heusinger in 1864. It is an epithelial tract, skin lined blind ended sinus formed due to a developmental defect in the first and second branchial arches during the sixth week of gestation due to incomplete fusion of the six auditory hillocks of His.<sup>1</sup> There is also a less accepted theory where it is stated that the sinus develops during embryonic auricular development from an isolated ectodermal folding.<sup>2</sup>

Classically, a preauricular sinus presents as a small opening near the anterior limb of the ascending helix. A small percentage has been reported and located in other areas such as the posterosuperior edge of the helix, the tragus, the lobule, the ascending helix crus, supra-auricular area, and the postauricular area.<sup>3-8</sup>

Pre auricular sinus is commonly unilateral and sporadic and can be bilateral too. Bilateral cases are more likely to be inherited, incomplete autosomal dominance with reduced penetrance. This condition is usually asymptomatic, but at times it may get repeatedly infected and presents with painful swelling and purulent discharge. Frequent discharge or abscess formation following preauricular lymphadenitis should prompt early intervention.

Pre auricular sinus tract course in subcutaneous tissues is not constant. They may arborize and follow a tortuous course with multiple terminal ramifications. The tract is prone to recurrence if it is not excised completely.

In the literature, a standard surgical technique has been described (simple sinusectomy) that provides an elliptical skin excision around the sinus opening and the dissection of its ramifications in the subcutaneous tissues under visual or palpatory guidance<sup>3</sup>. In 1990, Prasad et al.<sup>9</sup> for the first time, described a new surgical approach defined supra-auricular which was based upon the theory that a fistula is, almost always, included in subcutaneous tissues between the temporalis fascia and perichondrium of the helical cartilage. Therefore, these authors proposed that the elliptical incision of the standard technique to be extended higher upward to the pre- and supra-auricular temporal region.

### **AIMS AND OBJECTIVES**

1. To evaluate the demographics of presentation of pre auricular sinus in patients undergoing surgery.
2. To compare outcomes of the pre auricular sinus excision by simple sinusectomy and by supra-auricular approach with regards to recurrence, wound dehiscence, bad scars and post-operative infections.

### **II. Material And Methods**

**Study type:** Comparative prospective study

**Study area:** Tertiary Care Centre

**Study duration:** June 2018 to September 2019 with follow up period for at least 6 month

**Sample size:** 46 (23 in each group)

**Sample Collection:** Alternate sampling

**Inclusion Criteria:**

Patients with recurrent and intermittent discharging pre auricular sinus.

Patients with recurrent pre auricular swelling and abscess.

**Exclusion Criteria:**

Patient with active discharging sinus

Suppurative stage of preauricular abscess

Patients with other congenital malformation of pinna

### **WORK UP PLANS**

Informed consent in written was taken from the patients were included in this study by inclusion criteria . Detailed otological, nasal and throat examinations were performed on all the patients who fulfilled inclusion criterias. Full general examinations were done to rule out associated other congenital anomalies. Abdominopelvic ultrasound scan was performed to rule out congenital renal anomalies. All infections were treated with appropriate antibiotics and in case of preauricular abscess, aspiration done followed by full antibiotic course before surgical excision. Patients were divided into 2 groups by alternative sampling.

**Group A:** Preauricular sinus was excised by classical simple sinusectomy using methylene blue dye along with probing.

**Group B:** Preauricular sinus was excised by the supra-auricular approach.

All the patients were given mastoid bandage after surgery and follow up were done for at least 6 months after surgery.

### **SURGICALTECHNIQUES:**

#### **Simple sinusectomy using lacrimal probe and methylene blue dye:**

Under general or local anesthesia gentle probing with a lacrimal probe was done first and then Methylene blue dye was injected through the sinus opening (Fig 1.1) for tracing the extent of the sinus tracts. An elliptical incision was given (Fig 1.2) parallel to the edge of the anterior helix including the sinus opening. Meticulous dissection and excision of the complete sinus with its all ramifications was done (Fig 1.3).



Fig 1.1

Fig 1.2

Fig 1.3

**Fig 1: Pre auricular sinus excision by simple sinusectomy- surgical steps**

**Supra-auricular approach:** The elliptical incision used around the sinus opening was extended down to the upper end of the tragus and up parallel to the anterior edge of the anterior helix (Fig 2.1). The incision was deepened (Fig 2.2) till the temporalis fascia was identified as a medial limit of the dissection (Fig 2.3). The dissection continued over the cartilage of the anterior helix. The base of the sinus attached to the perichondrium of the anterior helix was excised (Fig 2.4) with the perichondrium to ensure complete excision of the epithelial lining along with surrounding soft tissues. (Fig 2.5)<sup>3</sup>

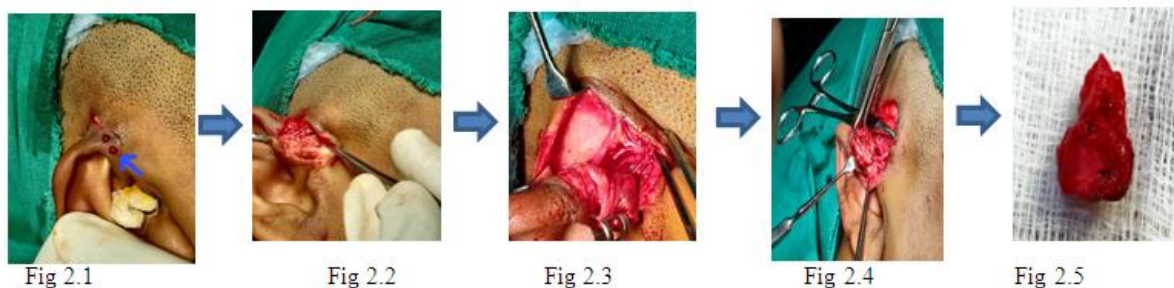


Fig 2.1

Fig 2.2

Fig 2.3

Fig 2.4

Fig 2.5

**Fig 2: Pre auricular sinus excision by supra auricular approach- surgical steps**

### Statistical analysis

Data was analyzed using SPSS version 27 (SPSS Inc., Chicago, IL). Pearson's Chi square test was used based on the type of data. P value < 0.05 was considered as statistically significant. Data were expressed by using tables and bar charts.

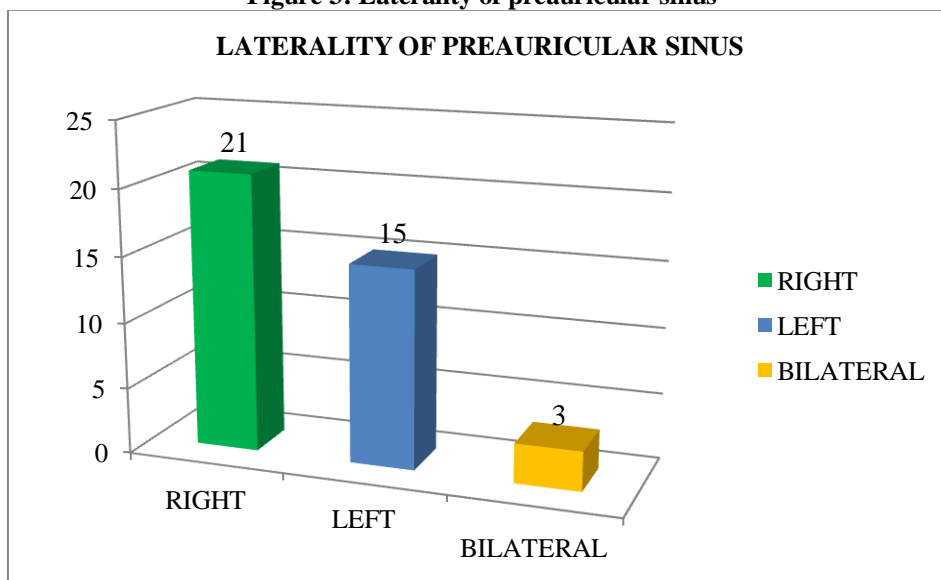
### III. Result

Excision of 46 preauricular sinuses carried out. 4 patients from group A and 3 patients from group B were lost to follow up. We analyzed data in 39 patients. The follow up period is 6 months. We have found 22 out of 39 patients undergoing surgery for pre auricular sinus are female (56.41%). It is seen that 17 patients (43.59%) are in 11-20 years age group. It was found that 21 (53.85%) patients had right sided pre auricular sinus got operated while 15 (38.46%) had left side and 3 (7.69%) had bilateral pre auricular sinus tract operation.

**Table 1: Age and Sex distribution of patients**

AGE (in years)	MALE	FEMALE	TOTAL	PERCENTAGE
0-10	3	2	5	12.82%
11-20	8	9	17	43.59%
21-30	4	7	11	28.21%
31-40	2	3	5	12.82%
>40	0	1	1	2.56%
<b>TOTAL</b>	17	22	39	100%

**Figure 3: Laterality of preauricular sinus**



**Table 2: Clinical Features Percentage occurrence (%)**

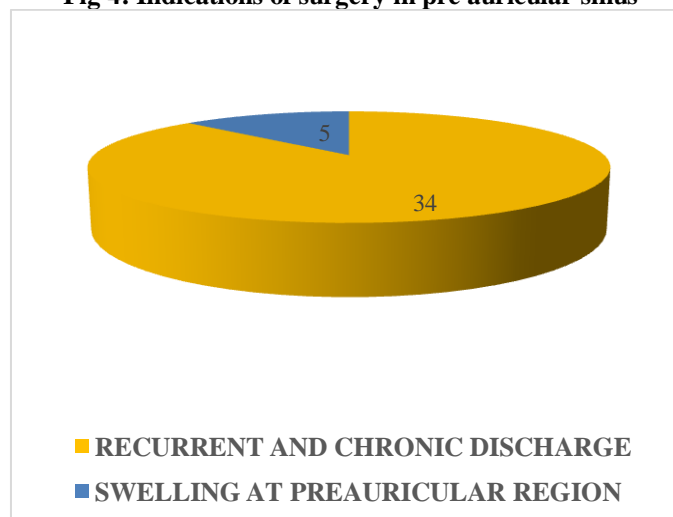
CLINICAL PRESENTATION	NUMBER OF PATIENTS	PERCENTAGE
Recurrent ear discharge	31	79.49%
Ear itching	25	64.10%
Recurrent ear pain	16	41.02%
Swelling front of the ear	14	35.90%
Fever	4	10.26%

Table 2 showed the various clinical manifestations of pre auricular sinus before undergoing surgery. 31 out of 39 (79.49%) patient had recurrent ear discharge followed by itching (64.10%), recurrent ear pain (41.02%) swelling in front of ear (35.90%) and fever in 10.26%.

31 out of 39 patients (79.49%) were indicated for surgery because of history of repeated infection and discharge from the sinus and 20.51% underwent surgery secondary to swelling at the preauricular region.

7 (17.95%) patients had history of previous aspiration from pre auricular abscess. 4 patients had previous history of excision of the sinus tract from outside.

**Fig 4: Indications of surgery in pre auricular sinus**



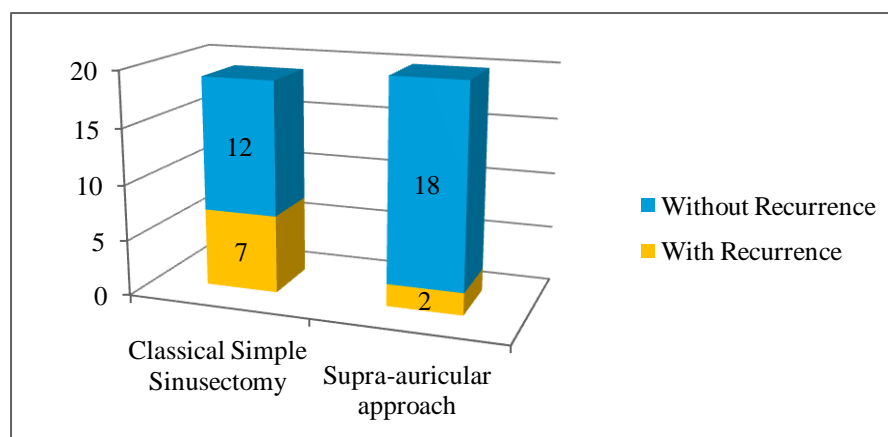
The overall recurrence rate is 23.08% (9 out of 39). The simple sinusectomy has the recurrence rate 36.84% (7 out of 19) whereas supra auricular approach has recurrence rate 10% (2 out of 20) with significant

difference (p=0.0476). Of the sinusectomy approach cases, there were 1 dehiscence wound (5.26%), 3 infections (15.79%), 4 bad scars (21.05%) documented, whereas only 2 operated preauricular sinus (10%) by supra-auricular approach reported infection with bad scars but no wound dehiscence.

**Table 3: Primary outcome after treatment in both groups**

OUTCOME	CLASSICAL SIMPLE SINUSECTOMY n=19	SUPRA-AURICULAR APPROACH n=20
Post-operative infections	4(21.05%)	-
Wound dehiscence	1(5.26%)	-
Bad scar	3(15.79%)	2(10%)
Recurrence	7(36.84%)	2(10%)

**Fig 5: Recurrence after surgery by simple sinusectomy and supra auricular approach**



#### IV. Discussion

Preauricular sinus is a congenital malformation of external ear. Though this remains asymptomatic in majority of patients but when there is swelling, repeated infection and discharge from the sinus, surgical excision of the sinus tract is the treatment of choice. Our study shows majority of pre auricular sinus that have undergone surgical excision are seen in female (56.41%). This may be due to as there is chance of repeated infection is higher in women because of applying of facial make up and cosmetic usage. This finding is similar to Adegbiji. W.A et al<sup>10</sup>, Leopardi G. et al<sup>11</sup>, Kavita M et al<sup>12</sup>, but contradictory to a study conducted by Song- Hwan et al<sup>13</sup>, where they found preauricular sinus occurred more frequently in male (1.4 times).

We found pre auricular sinus is more common in 11-20 years age group (43.60%). In our study pre auricular sinus is more common in Right side. (53.85%). This finding is similar to Scheinfeld NS et al.<sup>14</sup>, Paulozzi LJ et al<sup>15</sup>. The reason behind it that may be because many people are right handed than left handed. So right ear is more probed than left ear.<sup>10</sup>

Preauricular sinuses when infected are prone to frequent and recurrent infection hence prior to surgical excision majority of patients had recurrent ear discharge (79.49%) and ear pain (41.02%) for several months to years. This may be due to residual bacteria in the sinus and susceptibility of the preauricular sinus to infection.

Incomplete excision of sinus tracts often leads to recurrence. In simple sinusectomy highly variable terminal ramifications are very difficult for the surgeon to identify.<sup>3</sup> Methylene blue dye use in classical simple sinusectomy has always a risk of dye spillage in the operative field thus making the sinus tract identification difficult. Furthermore, recurrent infectious episodes, like abscess, can produce scars that further alter the sinus route. That's why in our study, this technique shows more recurrence. (36.84%). This finding is similar to Kavita M et al.<sup>12</sup> and El-Anwar M.W et al<sup>16</sup>.

On the other hand the Prasad .et.al<sup>9</sup> (1990) and Yoe .et .al<sup>4</sup> (2006) described that the supra auricular approach, a newer surgical technique, has lower recurrence rate when compared to simple sinusectomy. Our study showed only 10 % recurrence in this technique which is much lower than simple sinusectomy. This finding is similar to El-Anwar M.W et al<sup>16</sup>, Kavitha M et al<sup>12</sup>. Supra auricular approach is a simple, less time consuming approach and shows less difficulties as it does not require the surgeon to isolate and follow the every branches of the sinus as in the sinusectomy approach but simply identify the temporalis fascia as the medial border of dissection and the cartilage of the helix and auditory canal as the posterior border of dissection and remove the all soft tissues superficial to temporalis fascia and also part of helical cartilage. Thus, this technique

has easier learning curve. Also en bloc resection assures removal of sinus tract along with all its terminal branches, hence there is less chance of recurrence.

## V. Conclusion

Supra auricular approach offers prognostically better outcome for the management of the symptomatic pre auricular sinus. It offers a good option as a standard procedure for preauricular sinus excision. Failures to identify the course of the sinus tract properly, incomplete excision of the tract and post-operative infections are the risk factor for recurrences.

**Conflicts of interest:** None

**Financial support and sponsorship:** None.

**Patients' consent:** The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed

## References

- [1]. Nofsinger YC, Tom LWC, LaRossa D, Wetmore RF, Handler SD. Periauricular cysts and sinuses. *Laryngoscope* 1997;107(7):883–887
- [2]. Tan T, Constantinides H, Mitchell TE. The preauricular sinus: A review of its aetiology, clinical presentation and management. *Int J Pediatr Otorhinolaryngol* 2005; 69(11):1469–1474
- [3]. Lam HCW,G, Wormald PJ, Van Hasselt CA. Excision of the pre auricular sinus: a comparison of two surgical techniques. *Laryngoscope* 2001;111:317-9.
- [4]. Yeo SW, Jun BC, Park SN, et al. The preauricular sinus: factors contributing to recurrence after surgery. *Am J Otolaryngol* 2006; 27(6):396–400
- [5]. Chami RG, Apesos J. Treatment of asymptomatic preauricular sinuses: challenging conventional wisdom. *Ann Plast Surg* 1989; 23(5):406–411
- [6]. Choi SJ, Choung YH, Park K, Bae J, Park HY. The variant type of preauricular sinus: postauricular sinus. *Laryngoscope* 2007; 117(10):1798–1802
- [7]. Minkowitz S, Minkowitz F. Congenital aural sinuses. *Surg Gynecol Obstet* 1964;118:801–806
- [8]. Chang PH, Wu CM. An insidious preauricular sinus presenting as an infected postauricular cyst. *Int J Clin Pract* 2005;59(3):370–372
- [9]. Prasad S, Grundfast K, Milmo G. Management of congenital preauricular pit and sinus tract in children. *Laryngoscope* 1990;100:320- 1
- [10]. Adegbiji WA, Alabi BS, Olajuyin OA, Nwawolo CC. Presentation of preauricular sinus and preauricular sinus abscess in southwest Nigeria. *Int J Biomed Sci.* 2013;9(4):260-263.
- [11]. Leopardi G, Chiarella G, Conti S, Cassandro E. Surgical treatment of recurring preauricular sinus: supra-auricular approach. *Acta Otorhinolaryngol Ital.* 2008;28(6):302-305.
- [12]. Kavitha M, Senthil Kumaran.S. Comparison of surgical outcomes between supra auricular Approach technique and standard technique for pre auricular Sinus. *International Journal Of Scientific Research.* 2017. 6(9)
- [13]. Song-Hwan O, So IK, Kim JH. Clinical features of preauricular sinus and recurrence rate of supra-auricular approach. *Indian J Otol* 2018;24:91-4
- [14]. Scheinfeld NS, Silverberg NB, Weinberg JM, Nozad V. The preauricular sinus: a review of its clinical presentation, treatment, and associations. *Pediatr Dermatol* 2004;21:191-6
- [15]. Paulozzi LJ, Lary JM. Laterality patterns in infants with external birth defects. *Teratology* 1999;60:265-71.
- [16]. El-Anwar MW, ElAassar AS. Supra-auricular versus Sinusectomy Approaches for Preauricular Sinuses. *Int Arch Otorhinolaryngol.* 2016;20(4):390-393. doi:10.1055/s-0036-1583305

Dr SwetaVerma, et. al. “Is Supra Auricular Approach Better Than Simple Sinusectomy In Treating Pre Auricular Sinus? Our Experience in a Tertiary Care Hospital.” *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, 20(01), 2021, pp. 47-52.