



## Original Research Article

# CLINICAL OUTCOMES OF MICROSCOPE-ASSISTED SUPRA-AURICULAR EXCISION FOR PREAURICULAR SINUS

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### ABSTRACT

**Background:** Preauricular sinus (PAS) is a frequently encountered congenital anomaly of the external ear, typically appearing as a small pit or opening located anterior to the auricle. PAS is also referred to as a preauricular pit, preauricular tract, or helical fistula. The condition develops due to incomplete fusion of the six auricular hillocks during the sixth week of embryogenesis. Three hillocks arise from the first branchial arch and three from the second branchial arch, and defective fusion of these structures results in formation of the sinus tract. The present study aimed to evaluate the surgical benefits of combining microscopic assistance with the supra-auricular approach in PAS excision.

**Materials and Methods:** This prospective longitudinal study was carried out in the Department of ENT at Narayana Medical College and General Hospital, Nellore. Fifteen patients diagnosed with PAS were included and scheduled for surgical excision. Detailed ENT evaluation was performed in all cases, and associated syndromic conditions were excluded. All patients underwent physician assessment and were considered medically fit for surgery. Surgical excision was performed using an elliptical incision around the sinus opening followed by supra-auricular dissection under operating microscope guidance (LEICA).

**Results:** Among the 15 patients, 9 were female and 6 were male. Ten patients had unilateral disease, while 5 had bilateral involvement. Of the unilateral cases, 7 involved the right side and 3 involved the left side. All cases were primary presentations without associated syndromic abnormalities. Patient age ranged from 7 to 45 years. The follow-up duration was 3 months. Six patients presented during the quiescent phase and underwent immediate surgery. One female patient presented with abscess formation and initially underwent incision and drainage; definitive surgery was postponed for 3 months until complete resolution of infection.

**Conclusion:** Preauricular sinus is a congenital lesion characterized by multiple branches and complex tract extensions, making incomplete excision a major cause of recurrence. The use of microscopic magnification together with the supra-auricular approach allows better visualization and more complete removal of the sinus tract and its ramifications. Excision of the surrounding soft tissue along with the tract may help minimize recurrence and improve surgical outcomes.

**Keywords:** Preauricular sinus; Supra-auricular approach; Microscope-assisted excision; Sinus tract excision; Preauricular tract.

## INTRODUCTION

Preauricular sinus (PAS) is a common congenital anomaly of the external ear that typically appears as

a small pit or dimple located anterior to the auricle. Infection of the sinus may result in pain, swelling, and foul-smelling discharge. PAS is also referred to in the literature as a preauricular pit, preauricular

tract, or helical fistula. It was first described by Heusinger in 1864.<sup>[1,2]</sup>

PAS develops due to abnormalities during embryological formation of the auricle in the sixth week of gestation.<sup>[3]</sup> The auricle is formed by six mesenchymal hillocks, with three arising from the first branchial arch and three from the second branchial arch. Fusion defects among these hillocks can lead to the formation of a preauricular sinus. Another proposed mechanism suggests that PAS results from defective ectodermal folding during auricular development.<sup>[4-6]</sup>

The sinus tract often follows a variable and complex course within the preauricular soft tissue, showing multiple branches and extensions in the superior and medial directions.<sup>[7]</sup> Anatomically, the tract is usually located superficial to the temporalis fascia and lies lateral and superior to the parotid gland and facial nerve. The terminal portion of the tract commonly lies close to or adherent to the helical cartilage.<sup>[6,7]</sup> Because of these complex ramifications, complete surgical excision can be challenging and recurrence is common if residual tract tissue remains.

Surgical intervention is generally recommended after recurrent infections, usually following two or more episodes, and is preferably performed during the quiescent phase of the disease.<sup>[7-9]</sup> The most frequently isolated organism in infected PAS is *Staphylococcus* species, while *Proteus*, *Streptococcus*, and *Peptococcus* species are less commonly encountered.<sup>[10]</sup>

Conventional surgical management of PAS consists of simple sinectomy, in which an elliptical incision is made around the sinus opening followed by dissection along the subcutaneous plane toward the helix. In 1990, the supra-auricular approach was introduced as a modification of the standard technique, involving extension of the incision into the supra-auricular region.<sup>[11]</sup> This approach has gained wide acceptance because it facilitates easier dissection, improves complete tract removal, reduces recurrence rates, and produces cosmetically acceptable scars.<sup>[12]</sup>

The present study was undertaken to evaluate the surgical benefits of combining the supra-auricular approach with operating microscope assistance for improved visualization and complete excision of the preauricular sinus tract.

## MATERIALS AND METHODS

A prospective longitudinal study was conducted in the Department of ENT at Narayana Medical College & Hospital, Nellore, over a period of 12 months. A total of 15 patients diagnosed with preauricular sinus (PAS) were included in the study and underwent surgical excision. Detailed ENT evaluation was performed in all patients, and syndromic associations commonly linked with PAS were excluded.

All procedures were performed under general anaesthesia and surgical excision was carried out using an elliptical incision around the preauricular

sinus opening followed by supra-auricular dissection under operating microscope assistance.

### Inclusion Criteria

- Patients aged between 7 and 45 years
- Patients presenting in the quiescent stage of PAS

### Exclusion Criteria

- Patients with active infection at the time of surgery
- Patients with syndromic conditions associated with PAS

**Surgical Procedure:** All patients were sedated and continuously monitored intraoperatively by an anaesthetist. Following antiseptic preparation of the surgical field, 2% xylocaine with adrenaline (1:100,000) was infiltrated around the sinus opening to achieve local vasoconstriction and haemostasis.

A lacrimal probe was gently introduced into the sinus tract to identify its direction and extent. An elliptical incision was then made around the sinus pit and extended superiorly into the supra-auricular region. Using an operating microscope with 0.6× magnification and a 200 mm focal length lens, meticulous dissection of the sinus tract and its branches was performed with fine dissecting scissors toward the helix.

A small Babcock forceps was used to grasp and stabilize the sinus opening during dissection. The surrounding preauricular soft tissue was excised en bloc along with the sinus tract to ensure complete removal of all branches and reduce the likelihood of recurrence. Careful haemostasis was achieved under magnification, allowing wound closure without placement of a drain.

The combination of the supra-auricular approach and microscopic magnification provided improved visualization of the sinus tract and its ramifications, facilitating complete excision and potentially reducing recurrence rates.

## RESULTS

A total of 15 patients with preauricular sinus (PAS) were included in the study. Among them, 9 (60%) were females and 6 (40%) were males. Unilateral involvement was observed in 10 patients (66.7%), whereas 5 patients (33.3%) had bilateral disease. Among the unilateral cases, the right side was affected in 7 patients and the left side in 3 patients.

All patients were primary cases, and none were associated with syndromic anomalies related to PAS. The age of the patients ranged from 7 to 45 years. The postoperative follow-up period was 3 months, during which no recurrence was observed.

One female patient presented with abscess formation at the time of evaluation. Incision and drainage were initially performed to control the infection, and definitive surgical excision was postponed for one month until complete resolution of the inflammatory process. Overall, all patients showed satisfactory wound healing with good cosmetic outcomes following microscope-assisted supra-auricular excision.

**Table 1: Demographic and Clinical Characteristics of Patients with Preauricular Sinus (n = 15)**

Variable	Number of Patients	Percentage (%)
Gender		
Female	9	60.0
Male	6	40.0
Laterality		
Unilateral	10	66.7
Bilateral	5	33.3
Side Involved (Unilateral Cases)		
Right side	7	70.0
Left side	3	30.0
Type of Case		
Primary cases	15	100
Syndromic association	0	0
Clinical Presentation		
Quiescent stage	14	93.3
Abscess formation	1	6.7
Age Range	7-45 years	—
Follow-up Duration	3 months	—
Recurrence During Follow-up	0	0



**Excision of the tract**



**Microscopic picture of specimen**



**Supra Auricular- Incision**



**Complete excision- post images**



**Excised Sinus Tract**

## **DISCUSSION**

Preauricular sinus (PAS) is a congenital malformation of the external ear that often presents a surgical challenge because of its variable anatomy and multiple branching tracts. Incomplete excision remains the primary cause of recurrence following surgery. Therefore, adequate exposure and precise identification of the entire sinus tract are essential for successful management.

In the present study, 15 patients with PAS underwent microscope-assisted supra-auricular excision. Female predominance was observed, with females accounting for 60% of the cases. Similar female predominance has been reported in studies conducted

by Lam et al,<sup>[1]</sup> and Gur et al,<sup>[9]</sup> The majority of our patients had unilateral disease (66.7%), with the right side being more commonly affected than the left side. These findings are consistent with observations made by Currie et al., who also reported unilateral presentation as the most frequent pattern.<sup>[8]</sup>

The age of patients in the present study ranged from 7 to 45 years, indicating that PAS can present across a broad age group. Most patients presented during the quiescent stage of the disease, allowing definitive surgical management without active infection. One patient presented with abscess formation and required incision and drainage before delayed excision. Similar management protocols have been recommended in previous studies, which advise surgical intervention only after adequate control of acute infection to reduce postoperative complications and recurrence.<sup>[8,11]</sup>

The conventional simple sinectomy technique has historically been associated with relatively higher recurrence rates because of difficulty in identifying all ramifications of the sinus tract.<sup>[13]</sup> The supra-auricular approach introduced by Prasad et al,<sup>[11]</sup> provided wider surgical exposure and facilitated more complete excision of the tract and adjacent tissue. This technique significantly reduced recurrence rates compared to conventional sinectomy.

In the present study, the supra-auricular approach was further enhanced using operating microscope assistance. Microscopic magnification enabled better visualization of fine tract branches and surrounding soft tissue planes, thereby allowing meticulous dissection and complete excision of the sinus tract. No recurrence was observed during the 3-month follow-up period. Comparable outcomes were reported by Lam et al., who demonstrated lower recurrence rates with supra-auricular dissection compared to standard sinectomy.<sup>[1]</sup>

Similarly, Baatenburg de Jong emphasized that wider excision with better visualization minimizes residual disease and recurrence.<sup>[7]</sup>

The use of an operating microscope also improved intraoperative precision and haemostasis. Magnification facilitated identification of tract extensions adherent to the helical cartilage, which is considered a common site for residual disease.<sup>[11]</sup> In addition, careful excision of surrounding preauricular soft tissue together with the tract may have contributed to the absence of recurrence in our series. Cosmetic outcome is another important consideration in PAS surgery, especially in young patients. The supra-auricular extension used in our study healed with aesthetically acceptable scars in all patients. Similar cosmetic advantages have been highlighted in previous studies evaluating the supra-auricular approach.<sup>[1,11]</sup>

Although the results of the present study are encouraging, the study has certain limitations. The sample size was relatively small, and the follow-up duration was limited to 3 months. Longer follow-up

and larger comparative studies are required to further validate the effectiveness of microscope-assisted supra-auricular excision in preventing recurrence.

The findings of the present study suggest that combining the supra-auricular approach with operating microscope assistance provides better visualization, facilitates complete tract excision, and may reduce recurrence in patients with preauricular sinus.

## CONCLUSION

Preauricular sinus (PAS) is a common congenital anomaly of the external ear characterized by multiple branches and variable tract extensions, making incomplete excision a significant cause of recurrence. Complete identification and removal of the sinus tract and its ramifications are essential for successful surgical management. The present study demonstrates that microscope-assisted supra-auricular dissection provides enhanced visualization of the sinus tract and facilitates meticulous excision. Removal of the surrounding preauricular soft tissue along with the tract helps ensure complete clearance and may reduce the likelihood of recurrence. The combination of microscopic magnification and the supra-auricular approach appears to be a safe and effective surgical technique with favorable clinical and cosmetic outcomes.

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