

Modified supraauricular approach in recurrent preauricular sinus: A case report

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Case Report

ABSTRACT

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The preauricular sinus (PAS) also known as the fossa fistula sac or depression is located near the external auricle at the posterior end of the stalk of the ascending helix. Most cases of PAS are asymptomatic and do not require treatment. Surgery is performed if there are signs of infection or recurrence. Incomplete PAS resection is the most common cause of recurrence. The real problem with surgical resection of PAS is the high recurrence rate after sinusectomy. We report the case of a 22-year-old woman who complained of a mass in her left ear that was enlarging for the past 3 months. The patient had previously undergone two operations at the same site but they were recurrent. Physical examination revealed a non-hyperemic painful cystic mass. A few days after the operation the patient recovered and the pain in front of his left ear disappeared. The patient can close his eyes and lift his forehead symmetrically and show no signs of infection. A follow-up examination 1-2 weeks after surgery in the Department of Ear Nose Throat Head and Neck Surgery (ENT-HNS) showed that the general condition of the patient was good and there were no signs of infection. After 6 months the patients ears returned to normal and there was no recurrence 6 months after surgery. There is a scar along the leading edge of the helix. The patient was diagnosed with a recurrent PAS complicated by a preauricular cyst and treated with sinusectomy using a modified supraauricular approach and resection of the preauricular cyst. Sinusectomy with a modified supraauricular approach is an effective technique and is superior to simple sinusectomy due to its low recurrence rate with minimal complications and superior aesthetic appearance. This modified supraauricular approach achieved excellent functional and aesthetic results in this patient.

INTRODUCTION

The preauricular sinus, also called a cyst, fistula, hole, canal, or depression, is located next to the outer earlobe at the anterior end of the ascending crural helix.¹ This condition was first described by Heusinger in 1864.^{2,3} Preauricular sinus is a common birth defect in children. Most of the PAS arises laterally as a fossa along the posterior edge of the elevating spiracle and is usually located posterior to the external auditory meatus.⁴ Surgical approaches to treating PAS vary.

Incomplete PAS resection is the most common cause of recurrence. Asymptomatic PAS does not require surgical treatment unless it causes significant discomfort. But if the area has a foul-smelling swelling deep ulcers or frequent skin irritations surgery may be necessary to completely remove the lesions. The presence of residual tissue can lead to complications such as recurrence and postoperative infection.⁵ Several surgical techniques have been proposed to reduce the risk of recurrence. The objective of this study was to

determine the efficacy of reconstructive surgery in patients with PAS.

CASE DESCRIPTION

A 22-year-old female patient came to the ENT-HNS clinic with a chief complaint of a lump in front of the left ear in size of a pea that getting bigger for 3 months, the patient has felt the lump in the last 3 years ago. The lump was painless, no pus or blood came out. The patient reported a history of previous surgery in the same area 3 years ago due to an infection in front of the left ear. One year later, the complaints were repeated, and surgery was carried out again. After the second surgery, the patient complained of pus and pain in the front of the ear. There was no history of ear discharge, decreased hearing, or drooping face and there are no family members with similar complaints or a family history of deafness.

On physical examination, general status was good, and compos mentis consciousness. On the right earlobe, there was no deformity or mass. The right retroauricular area did not present edema and cicatricial hyperemia. The right ear canal was dilated without effusion in the tympanic membrane and light reflection was intact. There were no abnormalities in the left earlobe. The dense rim in the preauricular region was cystic without hyperemic tenderness and scar tissue was visible along the anterior helical margin (Figure 1). The ear canal is wide the tympanic membrane is intact and the compression is mild. No hyperemia and cicatricial edema were present in the left retroauricular area.

Nose and throat examination within normal limits. Tuning fork and laboratory investigations were within normal limits. The patient was then diagnosed with a left preauricular cyst with recurrent PAS. The patient was then diagnosed with a left preauricular cyst in recurrent PAS. The patient was scheduled to undergo an extirpation of left preauricular cyst with a modified supraauricular approach under general anesthesia.

The operation began with the patient lying supine on the operating table with his head facing the right, and then aseptic and antiseptic procedures were performed in the operating field. A sterile doek was placed on the operating area and then the mass was identified in the preauricular area. There was a palpable cystic mass, well circumscribed and the mass was not hyperemic. Infiltration with epinephrine:lidocaine (1:200,000) at the incision site was performed, then an elliptical incision was made parallel to the relaxed skin tension lines (RSTL) above the mass. The incision wound then widened using blunt clamps and extended anteriorly, inferiorly, superiorly, and posteriorly. A cystic mass was seen (Figure 1B) 20x15x15 mm in size, the mass then released from the surrounding tissue and its attachment and expanded to the crus helix cartilage. The attachment mass and cartilage were then sutured and cut. The incision was deepened until the temporalis fascia was identified as the medial border of the dissection. The base of the cyst attached to the anterior perichondrium of the helix was excised to ensure complete excision. Bleeding was evaluated, then cauterized and sutured the

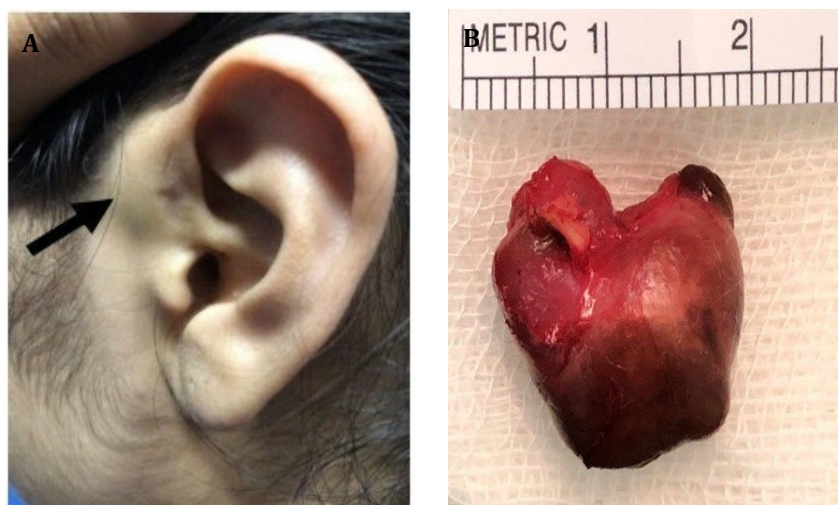


Figure 1. A. Preauricular sinus with complications of preauricular cyst (designated black arrow), B. Cystic mass with caudal attachment to cartilage

inside using Vicryl 4.0 and the outside using Prolene 6.0 and a drain was placed using a wing needle tube number 23G. The surgical wounds were then covered with gauze and bandage.

Postoperatively, the patient was treated in the ENT-HNS ward with intravenous fluid drip (IVFD) Ringer's lactate 20 drops/minute, cefotaxime injection 2x1,000 mg, and paracetamol tablet 3x500 mg. On the first postoperative day, the patient's general condition was good and there was no pain in the left ear. The patient was able to close his eyes and lift his forehead symmetrically. At wound care, the surgical site was good, there was no sign of infection, and the drain with a production of 2 cc. The patient was diagnosed with post-extirpation of the left preauricular cyst with a modified supraauricular approach with an indication of a left preauricular cyst in recurrent PAS.

The second day after surgery, a drain was removed, with drain production <1cc. There was no sign of infection. The patient was allowed to be discharged and got therapy clindamycin tablets 4x150 mg, paracetamol tablets 3x500 mg, and suggested to control at 7 days postoperatively. A week after surgery, the patient came for control to the ENT-HNS Department. General condition was good. The surgical wound was good, there were no signs of infection. The patient was able to close his eyes and lift his forehead symmetrically right and left. Two weeks after surgery, the patient came for control to the ENT-HNS Department. General condition was good. The surgical wound was good, there was no signs of infection (Figure 2A). The patient brought the results of the anatomical pathology examination with the results of an epidermal cyst. After 6 months, the patient showed normal ear, and no recurrence 6 months after surgery action (Figure 2B).

DISCUSSION

We reported a case of 22-year-old female patient with diagnosis PAS recurrent with complication epidermal cyst and management by supraauricular approach modification sinusectomy and extirpation of left preauricular cyst in general anesthesia with excellent functional and aesthetic results. Preauricular sinus is a congenital disorder with various forms of cysts, fistulas, neural defects and others.²

The average age was 6.22 ± 4.06 years old,

and the male-to female ratio was similar in the single-excision group (M:F = 68:63) but higher for females in the double excision group (M:F = 5:16) ($p = 0.017$).⁶ Based on gender, PAS is more common in women than men, with an incidence rate of 62% in women and 38% in men.⁷ In this case, the location of the PAS is in the left ear, unilateral with female gender.

Preauricular sinuses are generally asymptomatic and are generally found incidentally during routine medical examinations. Complaints arise when the PAS is infected with complaints of itching, swelling, redness and can develop into an abscess.^{7,8} The most common pathogens that cause infection include *Staphylococcus* species and other pathogens, *Proteus*, *Streptococcus* and *Peptococcus*.¹ In this case, the patient started complaining 5 years ago with complaints of redness, pain and swelling and then surgery was performed 2 times. However, complaints still arise after the surgery.

The diagnosis of PAS is generally based on history and physical examination. Preauricular sinuses generally look like pits near the anterior of the ascending helix or in the external auditory canal.^{8,9} or better known as the classic type.³ Meanwhile, the variant type is characterized by a small hole (pit) behind an imaginary vertical line drawn from the posterior aspect of the tragus and the posterior aspect of the ascending helix.¹⁰ In some cases it appears in a supero-posterior location on the outer edge of the helix, tragus, lobules, crus of the ascending helix, supraauricular, and postauricular.⁹ In this case it is a classic type of preauricular cyst with spillage of the infected squamous debris into the subcutaneous fat layer.

Some infected sinuses/cysts can lead to chronic preauricular abscesses. It is thought to be caused by rupture of the anterior wall of the preauricular cyst and release of infected plaque fragments into the subcutaneous fat layer.¹¹

On pathological examination, it was found that an epidermal cyst, with a microscopic appearance, showed pieces of tissue in the form of a cyst wall with a surface lined with stratified squamous epithelial cells, the lumen containing a mass of keratin. These findings are consistent with the literature that epidermal cysts are surrounded by an epithelial cell wall of lamellar or nonlamellar squamous epithelium and are commonly called true cysts. Skin cysts are usually round dome-

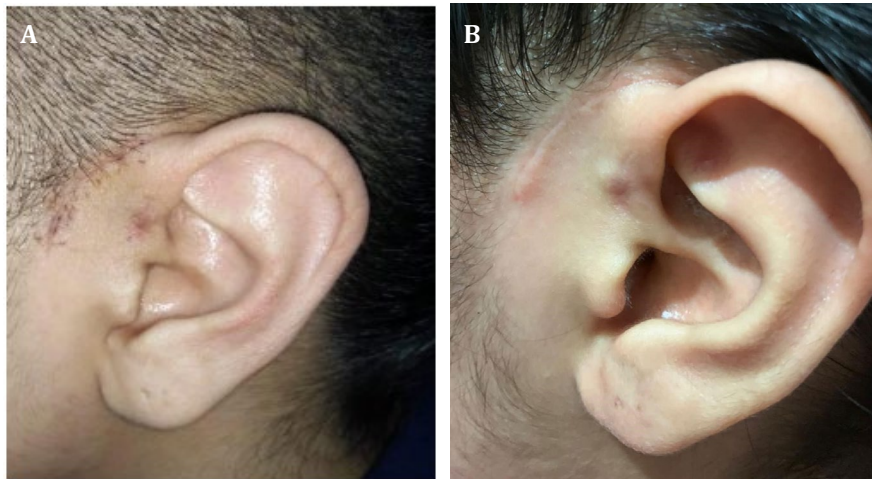


Figure 2. Operation wound A. 2 weeks after surgery, B. 6 months after surgery, no recurrence

shaped raised papules or nodules on the skin or subcutaneous tissue.¹²

Epidermal and dermal cysts can be congenital or acquired in equal numbers.¹³ An acquired cyst usually occurs through an infectious process around the pilosebaceous follicle or through implantation deep into the epidermis as a result of penetration or blunt trauma.^{13,14} In this case, a cyst occurred after 2 operations, so it is possible that the cyst found was an acquired cyst, due to incomplete excision before.

Asymptomatic PAS do not require treatment. Patients with signs of infection such as edema, redness, pain, both with and without abscess are recommended for sinus tract excision.¹⁵ The patient found indications of infection so PAS surgery was performed. However, recurrence occurred 1 year after surgery. The postoperative reappearance rates range from 9% to 42%.¹ The highest recurrence rate was found in the classic type compared to the variant type with percentages of 25% and 60%, respectively. Meanwhile, based on the surgical technique, the surgical technique with the simple sinusectomy method had a higher recurrence rate than the supraauricular approach with the percentages of 6.75% and 4.25%, respectively.⁴ Another study also stated a recurrence rate of 3.3% and 17.1%, using a simple sinusectomy technique compared to a supraauricular approach.¹⁶ It was also said that the recurrence rate was lower with microscope-guided resection at 0.9%, compared to 4.3% with methylene blue guidance and lacrimal resection.¹⁷

Preauricular sinus recurrence is due to incomplete removal of the sinus tract and the

presence of residual squamous epithelium that usually occurs with traditional elliptical excision or simple sinusectomy. The main factor causing recurrence is incomplete resection.⁵ This case demonstrates the efficacy of a modified supraauricular approach in the treatment of a complex case of PAS with complete resection and reduced cosmetic aspects of complications. Thus, there have been many advances in surgical techniques for PAS with the aim of reducing recurrence.¹⁸ Modified supraauricular approach is good with recurrent infections or with abscesses. In this patient, this technique achieved excellent functional and aesthetic result.

Factors that lead to incomplete sinus excision can be due to sinus tracts that branch and have various variations, especially terminal branches that can lead superiorly and medially. A previous history of infection or abscess can alter the sinus passages, making it difficult to trace the passage.⁹ In this case, the patient had two recurrences. Possible recurrence due to incomplete excision.

For typical PAS cases without inflammation, surgery was performed as follows: PAS was picked with indigo dye solution (Inc. Seoul South Korea United Pharm) to completely remove the lesion before surgery.⁶ No significant difference was found in clinical parameters between the two groups including age, sex, follow-up duration, and PAS site.²⁰

A lack of meticulous surgical technique to ensure no residual tissue is left behind may also contribute to sinus recurrence. Our surgical technique described represents a safe and reliable method to manage PAS and highlights crucial

operative aspects to achieve complete excision as a single-stage procedure.¹⁹

In a study conducted in 2018, a modification of the supraauricular approach technique was carried out. This study reported that the disadvantage of the supraauricular approach is the creation of a large dead space by cutting the PAS together with the surrounding subcutaneous tissue due to widening of the supraauricular and retroauricular incisions. Therefore in the supraauricular revision technique an elliptical incision is made around the sinus ostium and extended 5 mm into the supraauricular region without extending into the retroauricular region. Use the lacrimal probe to identify the sinuses to avoid nasal errors (Figure 3). Duplicate cases are not investigated. After the PAS skin incision and the surrounding subcutaneous tissue between the temporal fascia and the helix are removed carefully

to avoid damage to the superficial temporal nerve. A portion of the spiral cartilage adjacent to the PAS bundle is then resected. After complete resection the wound is flushed with a povidone-iodine solution to prevent infection of the surgical site. The remaining distal subcutaneous tissue is then attached to the temporal fascia and spiral cartilage via a vertical pad from lateral to medial to eliminate dead space. In this case, a modified supraauricular sinusectomy was performed with satisfactory results, no recurrence 6 months after surgery action (Figure 4).

The advantage of the supraauricular approach is that it is a simpler and less time-consuming approach and presents fewer complications. The sinus branches should be separated and followed by the surgeon. The disadvantage of this technique may be that we need a longer incision line.



Figure 3. Before Sinusectomy with supraauricular approach modification



Figure 4. After sinusectomy with supraauricular approach modification

CONCLUSION

The modified supraauricular approach is an effective technique and is better than the simple sinusectomy technique, and reduces the postoperative recurrence rate. There were no significant postoperative cosmetic complications. This technique is good for PAS with recurrent infections. In this patient, this modified supraauricular approach achieved excellent functional and aesthetic results.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest. The patient gave informed consent for the publication of this case, while keeping the patient's personal data confidential.

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None

AUTHOR CONTRIBUTIONS

AH and WJ performs in observing, researching, and compiling manuscripts.

LIST OF ABBREVIATIONS

ENT-HNS: Ear Nose Throat Head and Neck Surgery; PAS: preauricular sinus; RSTL: relaxed skin tension lines.

REFERENCES

- Liaw J, Patel VA, Carr MM. Congenital anomalies of the external ear. *Oper Tech Otolaryngol - Head Neck Surg.* 2017;28(2):72–6. DOI: <https://doi.org/10.1016/j.otot.2017.03.012>
- Matev B, Lyutfi E, Stoyanov, George S, Sapundzhiev, Nikolay R. Preauricular sinus: A tale of forgetful rediscovery. *Cureus.* 2020;12(6):1–8. DOI: 10.7759/cureus.8885
- Chan KC, Kuo HT, Wai-Yee Ho V, Chuang WY, Chen ZC. A modified supra-auricular approach with helix cartilage suture for surgical treatment of the preauricular sinus. *Int J Pediatr Otorhinolaryngol.* 2018;114(123):147–52. DOI: 10.1016/j.ijporl.2018.08.041
- Kayode Aremu S, Wasiu O. Preauricular sinus-classic versus variant types among a cross-section subjects in Southwestern Nigeria. *J Adv Med Med Res.* 2018;27(7):1–10. DOI: 10.9734/JAMMR/2018/44017
- Bozan N, Feyyat Sakin Y, Gözen A, Bozkuş F. The preauricular sinus/cyst: A case report. *Van Tıp Derg Med J.* 2016;23(4):352–6. DOI: 10.5505/vtd.2016.83364
- Lee JW, Seo KS, Oh SJ, Kong SK, Kim SH, Lee IW, et al. Surgical technique for complicated preauricular sinus: Pilot study of double elliptical excision with coaptation suture. *Int J Pediatr Otorhinolaryngol.* 2024;117:111858. DOI : 10.1016/j.ijporl.2024.111858
- Ding H, Xie H, Qiao F, Wang T, Huang X, Ning Q. Supra-auricular and post-auricular resection of pre-auricular and post-auricular sinuses. *J Laryngol Otol.* 2019;133(11):980-5. DOI: 10.1017/S002221511900210X
- Kumari R, Jain RK, Chakraborty P, Pradhan S, Joshi P. Fistular opening below the intertragric notch: A rare variant of pre-auricular sinus. *J Clin Diagnostic Res.* 2016;10(9):9–10. DOI: 10.7860/JCDR/2016/18789.8434
- El-Anwar MW, Elaassar AS. Supra-auricular versus sinusectomy approaches for preauricular sinuses. *Int Arch Otorhinolaryngol.* 2016;20(4):390–3. DOI: 10.1055/s-0036-1583305
- Pang J, Xiong H, Liao Q, Xu Y, Huang Q, Ou Y. The diagnosis and treatment of a variant type of auricular sinus: Postauricular sinus. *Eur Arch Oto-Rhino-Laryngology.* 2019;276(7):1961–7. DOI: 10.1007/s00405-019-05431-7
- Isaacson G. Comprehensive management of infected preauricular sinuses/cysts. *Int J Pediatr Otorhinolaryngol.* 2019;127:109682. DOI : 10.1016/j.ijporl.2019.109682
- Hoang VT, Trinh CT, Nguyen CH, Chansomphou V, Chansomphou V, Tran TTT. Overview of epidermoid cyst. *Eur J Radiol Open.* 2019;6(2):291–301. DOI: 10.1016/j.ejro.2019.08.003
- Cho Y, Lee DH. Clinical characteristics of idiopathic epidermoid and dermoid cysts of the ear. *J Audiol Otol.* 2017;21(2):77–80. DOI: 10.7874/jao.2017.21.2.77
- Jung KH, Choi HJ, Nam DH. Characteristics of dermoid cyst of the auricle. *Arch Craniofacial Surg.* 2014;15(1):22–7. DOI: 10.7181/acfs.2014.15.1.22
- Choo OS, Kim T, Jang JH, Choung YH. The clinical efficacy of early intervention for infected preauricular sinus. *Int J Pediatr Otorhinolaryngol.* 2017;95:45–50. DOI: 10.1016/j.ijporl.2017.01.037
- Hwan S, So, In K, Kim, Jin H. Clinical Features of preauricular sinus and recurrence rate of supra-auricular approach Song-Hwan. *Indian*

- J Otol. 2018;23(3):261-5. DOI:10.4103/indianjotol.INDIANJOTOL_149_17
17. Rataiczak H, Lavin J, Levy M, Bedwell J, Preciado D, Reilly BK. Association of recurrence of infected congenital preauricular cysts following incision and drainage vs fine-needle aspiration or antibiotic treatment a retrospective review of treatment options. *JAMA Otolaryngol - Head Neck Surg.* 2017;143(2):131-4. DOI: 10.1001/jamaoto.2016.2988
 18. Manjunath HA, Santosh UP, Raman L, Nidhin SB. Supra auricular approach in management of preauricular sinus. *Indian J Otolaryngol Head Neck Surg.* 2020;72(2):153-5. DOI: 10.1007/s12070-019-01719-6
 19. Bulstrode N, Thacoor A. Management of the infected preauricular sinus. *Journal of Plastic, Reconstructive & Aesthetic Surgery.* 2023;83:305-307. DOI:https://doi.org/10.1016/j.bjps.2023.05.046
 20. Han JS, Park JM, Han JJ, Cho YS, Vidal JL, Park SY, et al. Surgical results of infected preauricular sinus: No need for delay. *Int J Pediatr Otorhinolaryngol.* 2020;135:110129. DOI : 10.1016/j.ijporl.2020.110129