

Epidemiological Study and Surgical Outcome of Preauricular Sinus

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Abstract:

Background: Preauricular sinus (PrAS) is a common congenital external ear malformation affecting mainly children. Symptomatic Preauricular sinus and asymptomatic for unusual scar marks, surgery is the mainstay of treatment. Due to variations in presentation and recurrence, surgeons practice different surgical procedures to treat the Preauricular sinus. **Objectives:** To compare the relative frequency and incidence of the Preauricular sinus and find the best surgical approach. **Methods:** It is a cohort retrospective study of forty-four cases of Preauricular sinus in the Department of Otorhinolaryngology and Head-Neck Surgery, Comilla Medical College, Bangladesh, from 01-07-2016 to 31-06-2019. All forty-four patients were clinically diagnosed with Preauricular sinus and confirmed by history, examination, and investigations. Special investigations included Audiological analysis and Ultrasonography of the renal system. **Results:** The incidence of Preauricular sinus out of 1,16,128 patients in the outpatient department was 44 (0.05%), and out of inpatient routine operative 2738 patients were 1.61%. Forty patients (90.90%) were treated by traditional sinusectomy, and the rest of the four patients

(9.10%) were treated by extended supra-auricular sinusectomy procedures. Relapse was taken place in two patients (4.54%). Gender issuance shows that female was 24(54.54%) and males was 20(45.46%). The age distribution exhibited in the case of children was 34(77.27%), and adult, was 10(22.73%). Anatomical site allocation reveal that right side was 22(50%), left side was 20(45.45%), bilateral was 2(4.55%) whereas unilateral was 42(95.45%). Presenting features display non-infected putty like discharge was 21(47.72%), infected abscess was 19(43.18%) and asymptomatic was 4(9.1%). A syndrome related to the Preauricular sinus was not found in our study. **Conclusion:** Children were more affected by the Preauricular sinus as a congenital disease. Incidence and recurrence are always countable from the perspective of treatment. As surgery is the treatment principle, it should be perfect without recurrence. We appreciate the supra-auricular approach for the excision of the Preauricular sinus, which best complements the patient's wishes.

Key Words: Preauricular Sinus (PrAS), Congenital, Recurrence.

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Introduction:

The outer ear begins to develop at six weeks of gestation. Auricle or pinna develops from a series of six tubercles or Hillocks, which form around the margin of the first branchial cleft. The external auditory canal began the ectoderm of the first branchial cleft. The six cartilaginous tubercles or Hillock's fuse form the pinna, three from the first branchial and three from the second branchial arch. Blind-ended PrAS results from the incomplete fusion of tubercles or Hillocks. Including epithelial tissue forms a skin lining to the sinus and may cause recurrent discharge and infection. The anatomical position of the PrAS is variable due to its developmental errors. Sinus openings or pits may be seen at the level of tragus, above or below it. If the sinus is at the level of or above the tragus, it is usually a single abnormality; if below the level of the tragus, it may involve multiple areas of the auricle, the external auditory canal, which reflect the first branchial cleft anomalies. A fistulous tract may be developed between the auricle and the external auditory canal in this situation. Family history may be seen in some cases.

Some syndromes are related to PrAS. One of the most important is branchio-oto-renal syndrome is diagnosed as an inherited autosomal dominant disorder that includes structural defects of the external ear, PrAS and renal disorders.^{1,2} PrAS may be unilateral or bilateral. It may be thought in mind that bilateral PrAS are sometimes present with hearing loss. So, management also needs to assess the hearing and renal impairment. The auricle is one of the most complex parts of the ear. Its developmental variations cause minor to significant abnormalities.³ The deformities include complete absence (Anotia), Peanut ear (Microtia), Macrotia (Large ear), Bat ear (Abnormally Protruding ear), Cryptotia (Upper third of pinna embedded under the scalp), Preauricular Tags (Skin covered tag) and PrAS.⁴ Among these developmental abnormalities, PrAS remain asymptomatic throughout life and may need plastic surgery for cosmetic purposes.⁵ As PrAS embryologically developed from the first and second branchial arch, the anatomical location of the sinus is superficial to the temporalis fascia. It is placed superiorly closely related to the parotid gland and facial nerve. Usually, all cases of the sinus tract are conjoined with the auricular cartilage.⁶

Methods:

It is a cohort retrospective study of forty-four cases of PrAS in the Department of Otorhinolaryngology and Head-Neck Surgery Comilla Medical College, Bangladesh, from 01-07-2016 to 31-06-2019. During these three years, total outpatients were 1,16,128, and 2,738 routine operations were performed in the inpatient department. The incidence of PrAS in these patients was calculated. All forty-four patients were clinically diagnosed as PrAS and confirmed by history, examination, and investigations. Notable investigations include audiological investigations such as pure tone audiometry, impedance audiometry and stapedial reflex test and ultrasonography of the renal system. We were following the two methods of operation. One was a traditional Sinusectomy, and another was an Extended Supra auricular approach for Sinusectomy. In the conventional method, we use methylene blue dye to locate the extension of the tract; an elliptical incision was given to surround the sinus opening and excise the sinus tract by dissection method. We extended the previous incision superiorly and posteriorly into the postauricular sulcus in the supra-auricular approach. Dissection was carried out up to the lateral border of temporalis fascia, which is a

medial limit of the sinus tract and continuous dissection over the auricular cartilage up to the anterior helix, regarded as the posterior and lateral limit of the sinus tract as the dissection should be carried out up to it. All tissue superficial to the temporalis fascia and the sinus tract was removed in toto. The epithelial lining of the sinus tract usually amalgamates with the perichondrium or the cartilage. So, a portion of the auricular perichondrium or cartilage is excised from the base of the sinus tract.⁷ The apropos evidence was collected, such as age, sex, presenting features, operative procedures, postoperative follow-up, and complication.

Results:

During these three years, 1,16,128 patients were in the outpatient department with distinct disease entities. The incidence of PrAS among them was 44(0.05%); Figure-1. Two thousand seven hundred thirty-eight routine operations were carried out during that time in which PrAS was 44(1.61%); Figure-. Traditional sinusectomy procedure executed upon forty patients (90.90%) and extended supra-auricular approach for sinusectomy method brought to pass only four patients (9.10%); Chart-1. Two patients (4.54%) had a postoperative relapse, accomplished by the traditional sinusectomy way; Figure-1. Gender issuance was near between females and males, where the female was 24(54.54%), and the male was 20(45.46%); Chart -2. The mean age of the patient was 14.5 years, whereas the lowest was three years, and the highest was 60 years. Though it is a congenital malformation, in our study, adults were 10(22.73%), and the rest of the cases were children 34(77.27%); Chart-3. According to WHO and UNICEF, children are up to 18 years old.

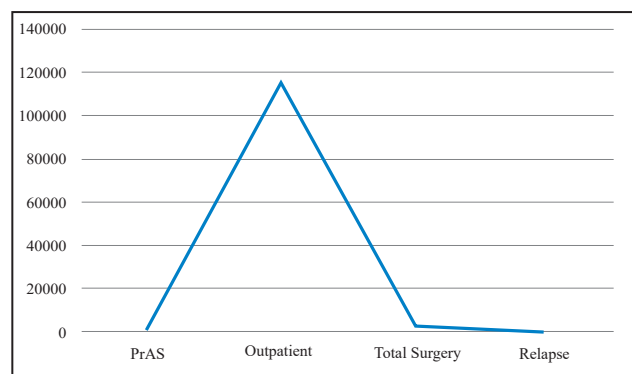


Figure-1: Pre-auricular Patient among Outpatient Department and Total Inpatient Surgery, Relapsing after Surgery.

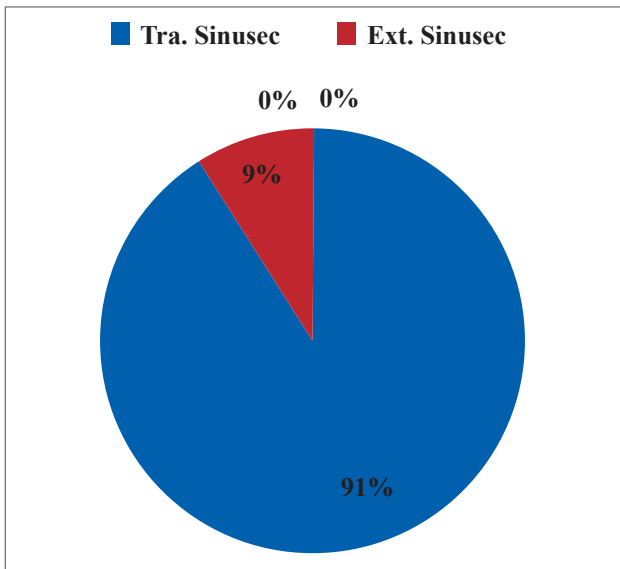


Chart-1: Methods of operation: (N-44; Traditional Sinusectomy-40: Extended Supra auricular Approach-4.

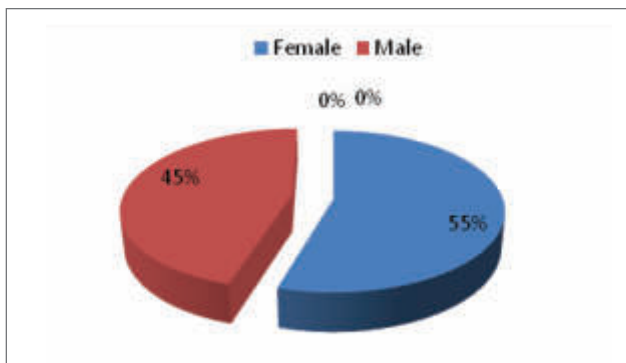


Chart-2: Gender Issuance: (N-44; Female-24 (54.54%): Male-20 (45.54%).

Anatomical site allocation of PrAS at right side was 22(50%), left side was 20(45.45%), bilateral was 2(4.55%) whereas unilateral was 42(95.45%); Figure-2. Presenting features of PrAS were non-infected putty-like discharge 21(47.72%), Infected, painful swelling with abscess formation 19(43.18%), and symptomless pit 4(9.1%); Chart-4. All investigations revealed normal hearing and normal renal function in all our cases.

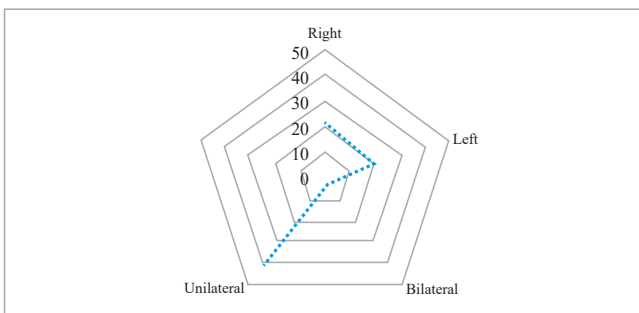


Figure-2: Anatomical Site Allocation.

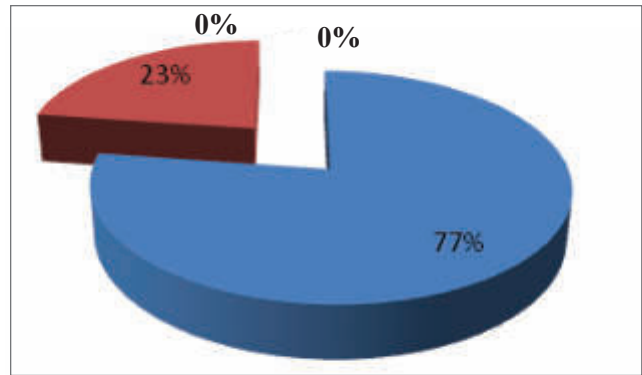


Chart-3: Age Distribution: (N-44; Children-34 [Up to age 18 yrs]: Adult-10 Above 18 yrs.)

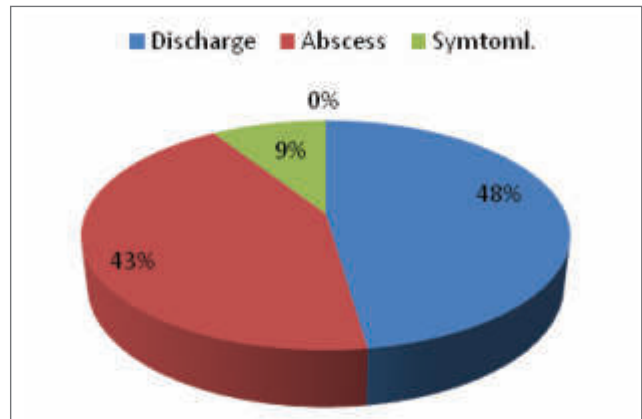


Chart-4: Presenting Features:(N-44; Putty like Discharge-21: Infected Abscess:19: Symptomless-4)

Discussion:

The auricle or pinna has a very complex embryological formation, and the final place of migration occurs after much more differentiation. As a congenital malformation, PrAS manifests like a tiny tattoo mark in front of the external ear above or below the tragus near the anterior limb of ascending helix. When it is present below the tragal cartilage, it may be present with other congenital anomalies or syndromes. Heusinger, an eminent surgeon, first noticed in 1864 that PrAS was a common congenital disorder.⁸ Some studies show that the sinus develops due to isolated ectodermal folding during the embryological development of the pinna.⁹ Incidence of PrAS in our study group was 0.05% to 1.61%, which is near to the incidence of USA (0.9% to 0.1%), UK (0.9%) and Taiwan (1.6% to 2.5%) but reverse to our study in different parts of Africa (04% to 10%).¹⁰ Gender epidemiology shows female preponderance in our study, supported by the Curric et al. series.¹¹ Some other studies show males and females are equally affected.¹² Further records appraisement that males are affected more than females, contrary to our study.¹³ As congenital malformation, children are more enduring the PrAS. In our recitation, more than one-third were

enduring from PrAS, which was accepted by all other series.¹⁴ More than 95% was unilateral in our discussion, which is towards to Scheinfeld NS study.¹⁵ Right side was more common than the left, which was also appraisal by Paulozzi LJ et al. series.¹⁶ Presenting complaints were non-infected putty-like discharge spontaneously or pressing over the opening of sinus were 21, infected painful swelling with the abscess formation were 19 which was backing by Chang PH et al. series.¹⁷ In contrast, asymptomatic were four which also acceptance by Huang XY perusal.¹⁸ In our discussion, hearing impairment or renal pathology was not recorded, which Adegbiyi WA et al. study supported.¹⁹ About the treatment, 40 were treated, followed by the traditional sinusectomy procedure, which almost all our surgeons practiced. However, the extended supra-auricular approach for sinusectomy was practiced by a few surgeons. Only 4 in our study were clenched by Mohamed EG et al. discussion.²⁰ Relapse after the operation was 2(4.54%) patients, which occurred the same in Gan EC practice.²¹ These two patients were treated by traditional sinusectomy procedure. A comprehensive supra-auricular approach of sinusectomy managed the relapse cases.²² The cases were healthy after a postoperative period.

Conclusion:

Most of our patients were children and presented with various clinical features. Most were unilateral and on the right side of the external ear. Surgical excision is the mainstay of the treatment of symptomatic PrAS. Most of our surgeons practiced the traditional sinusectomy approach in which relapsing was more than an extended supra-auricular approach. But the supra-auricular method was used for recurrence cases only. So, it is recommended to make the supra-auricular approach of the sinusectomy procedure a primary treatment of all topics. It may make the trainees and young surgeons familiar with the process and technique and interested in executing the surgical method for their PrAS patient.

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