

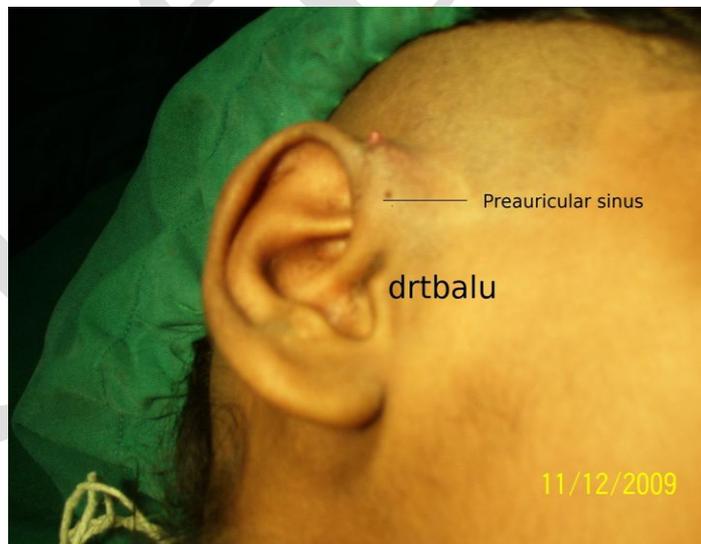
# Preauricular sinus

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## Management

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This e book discusses the Etiopathogenesis of preauricular sinus. Even though it is commonly encountered surgical extirpation of the sinus is associated with a high recurrence rate. This book discusses the points to be remembered while performing surgery in order to minimize recurrence rate.

# Preauricular sinus and its management

## Introduction:

This condition was first described by Van Heusinger in 1864. He also rightly postulated it to be congenital in nature. Most of these patients are symptomatic. Common symptoms include infections, cellulitis, and abscess formation in front of the pinna. Some of these patients may have recurrent infections leading on to embarrassing discharge from the sinus. In most patients this condition is identified during routine examination involving ear, nose and throat.

## Synonyms:

Various terminologies have been used to describe this condition. They include preauricular pit, preauricular fistula, preauricular tract, helical fistulae or preauricular cyst.

## Incidence:

The estimated incidence as reported by studies in US puts the incidence somewhere between 0.1 – 0.9%. Studies in Africa put a slightly higher figure (4 – 5%).

## Embryology:

Since this condition is an embryological aberration, a study of development of Pinna won't be out of place here. Studies have shown that the formation of preauricular sinus is closely associated with the development of pinna which occurs during the 6<sup>th</sup> week of gestation. Auricle develops from 6 mesenchymal hillocks known as Hillocks of His. Three of these hillocks arise from the caudal border of the first arch, and the other three arise from the cephalic border of the second arch. These 6 hillocks eventually fuse to form the full fledged pinna.

## Theories of preauricular sinus formation:

**Embryological fusion theory:** This commonly accepted theory attributes the development of preauricular sinus due to incomplete or defective fusion of these Hillocks.

Ectodermal infolding theory: This theory attributes isolated ectodermal folding during auricular development. This theory has virtually no takers.

Incomplete closure of dorsal part of first pharyngeal groove: This theory suggests that branchial fistula are formed due to incomplete closure of the dorsal part of first pharyngeal groove. This theory assumes that preauricular sinuses form part of branchiogenic malformations.

Preauricular sinus should not be confused with branchial cleft anomalies. These branchial cleft anomalies are intimately related to the external auditory canal / ear drum / angle of the mandible whereas the preauricular sinuses are not. It has also been shown that the preauricular sinus does not involve the facial nerve or its branches, of course surgical removal of preauricular sinus may put the facial nerve at risk.

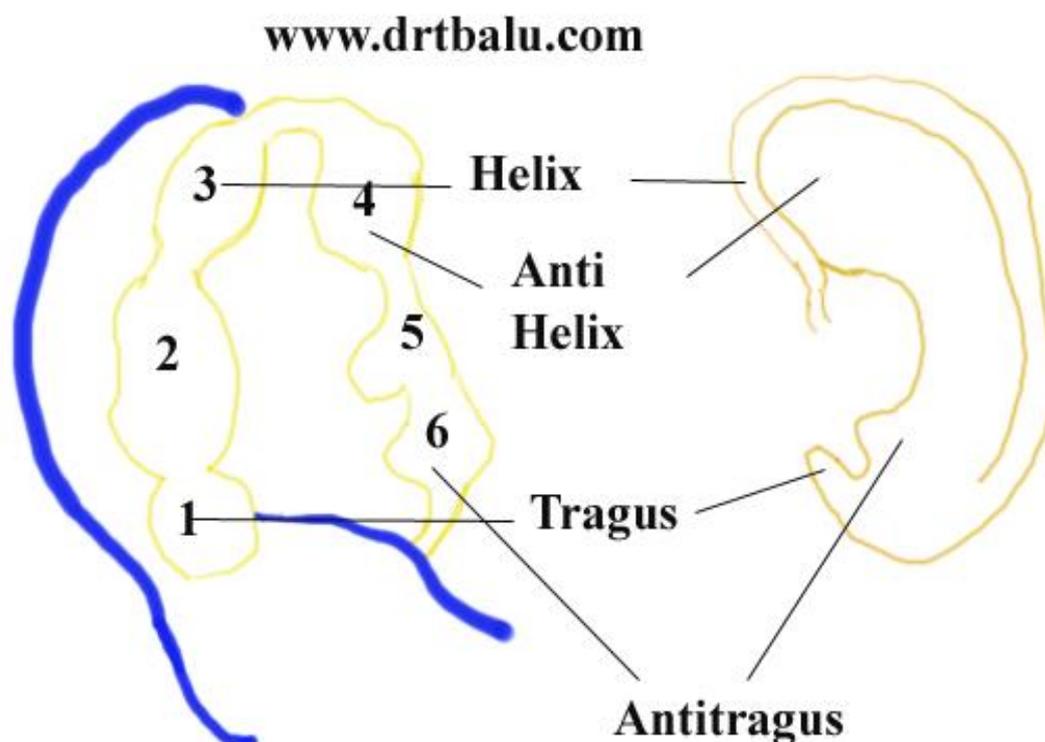


Figure showing the development of pinna

Mode of inheritance:

Preauricular sinus occurs either sporadically or may be inherited. In about half the [Otolaryngology online](http://www.drtbalu.com)

number of patients it occurs in a sporadic manner and commonly on the right side. Bilateral cases are commonly genetically inherited. Studies have shown that inheritance is autosomal dominant with varying degrees of penetration (about 85% penetration). Studies in China has shown chromosome 8q11 to be site of abnormal gene which transmits preauricular sinus.

Preauricular sinus has been described as a part of number of syndromes. These syndromes include:

1. BOR syndrome (Branchio oto renal syndrome) – defects in these patients include outer, middle and inner ear deformities with conductive deafness. These patients also have renal anomalies, lateral cervical fistulae, preauricular sinus, and nasolacrimal duct stenosis and fistula.
2. Branchio oto urethral syndrome – These patients have sensorineural hearing loss, preauricular sinus, renal anomalies like bifid ureters and bifid renal pelvis.
3. Branchio otic syndrome – This is a variant of BOR syndrome. These patients have branchial anomalies, preauricular sinus, branchial fistula (unilateral) with no renal dysplasia
4. Branchio oto costal syndrome – These patients have conductive deafness, preauricular sinus, bilateral commissural lip, unilateral branchial fistula and rib anomalies
5. Cat eye syndrome – Coloboma of iris, Preauricular sinus, imperforate anus and down slanting of palpebral fissures
6. Trisomy 22 – These patients have bilateral preauricular sinus, antimongoloid palpebral fissures, macroglossia, cleft palate, enlarged sublingual glands and short lower limbs

Clinical features:

Preauricular sinus is seen as a small pit usually at the anterior margin of the ascending limb of the helix. In some patients this opening may also be seen along the postero superior margin of helix. Rarely it may be seen close to the tragus or lobule. In almost all patients part of the tract blends with the perichondrium of the auricular cartilage.

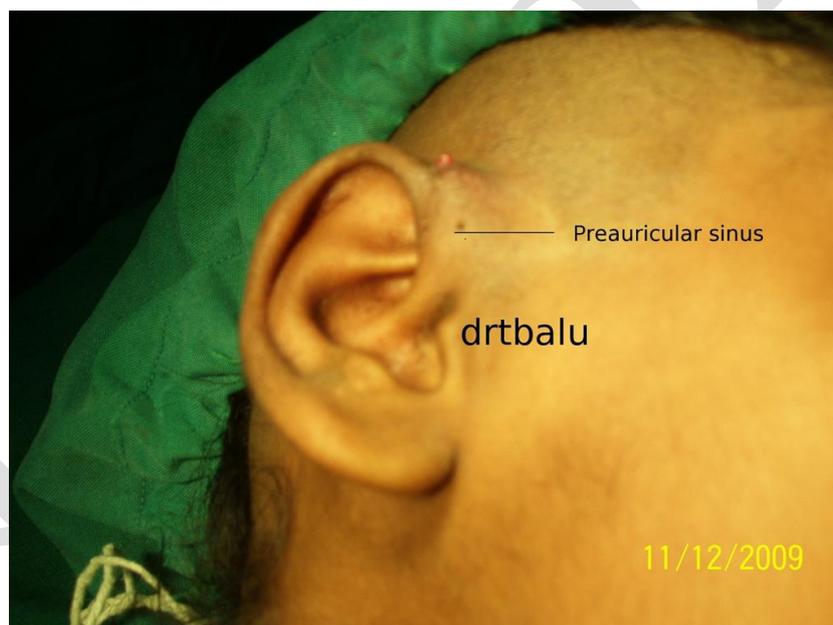
The sinus tract may follow a tortuous course. The sinus tract is usually superior and lateral to the facial nerve and parotid gland. This feature differentiates it from branchial cleft anomalies. Sometimes the preauricular sinus may lead to the formation of subcutaneous cyst that is intimately related to the tragal cartilage and the crus of helix.

Patients usually present with discharge from the preauricular sinus pit. Discharge could be due to desquamating epithelial debris or infection. Studies have shown that the common pathogens causing infection in the preauricular sinus include staphylococcus, proteus, streptococcus and peptococcus.

It is always better to rule out syndromes associated with preauricular sinus. Almost majority of these syndromes involve kidney. There is intense debate raging whether ultrasound examination should be performed as a routine in all patients with preauricular sinus. Considering the commonality of the lesion and the cost and time involved routine ultrasound in these patients are not indicated. Wang et al of California came out with a set of indications when ultrasound abdomen should be performed in these patients.

Wang's criteria in performing ultrasound examination in patients with preauricular sinus:

1. Presence of another malformation / dysmorphic feature
2. Family history of deafness
3. Malformations involving pinna
4. Maternal history of gestational diabetes



Picture of a patient with infected preauricular sinus

Puretone audiometry:

This is another investigation that should routinely be performed in all patients with preauricular sinuses.

Complications of preauricular sinus:

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Infection is the predominant complication. In the acute phase of infection (cellulitis stage) management is by prescribing appropriate antibiotics in adequate doses. Since the common infecting organism is staphylococcus aureus the drug of choice is a combination of amoxycillin and clavulanic acid.

**Abscess formation:** Abscess in this area should always be drained. Incision and drainage using a scalpel would cause extensive fibrosis causing difficulty in complete surgical clearance of the area at a later date. Precisely for this reason Coatesworth et al described a drainage procedure using lacrimal probe. This probe negates the need for incision in this area and thus causes very little disturbance to the underlying preauricular sinus tissue. In this technique of drainage the overlying skin is anesthetized using 2% xylocaine infiltration. The blunt end of the lacrimal probe is inserted into the sinus through the pit. This allows drainage to occur via the normal opening which is usually present in front of the ascending limb of the helix. If preauricular abscess does not drain when this technique is used then conventional incision and drainage should be performed. Recurrent infections involving the preauricular sinus should be managed by complete surgical resection of the sinus tract completely during the stage of quiescence.



Image showing lacrimal probe which is used to drain preauricular abscess

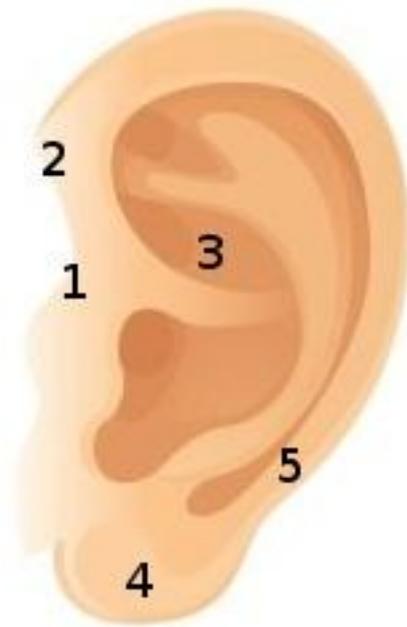


Figure showing the common sites of preauricular sinus involvement.

1. Anterior margin of ascending limb of helix (most common)
2. Superior to auricle
3. Along the posterior surface of cymba concha
4. Lobule
5. Posterior to auricle

Surgical excision of preauricular sinus:

While surgically excising the sinus tract care should be taken to completely remove it. Incomplete removal of sinus tract is the commonest cause for recurrence. The recurrence rate ranges between 1 – 45% depending on the procedure followed.

Simple sinnectomy:

This is the commonly used standard procedure for excising preauricular sinus. An ellipse of skin surrounding the preauricular sinus tract is excised and dissected out along with the tract. The tract can simply be identified by its glistening white color, or methylene blue dye can be injected through the opening to facilitate easy identification of the tract. Most of these fistulae follow the external auditory canal. This procedure can be performed under local or general anesthesia. While operating on children general anesthesia is preferred.

Jensma technique:

This technique was popularised by Jensma in 1970. It is actually a modification of the classic sinusotomy procedure. This technique is also known as inside out technique.

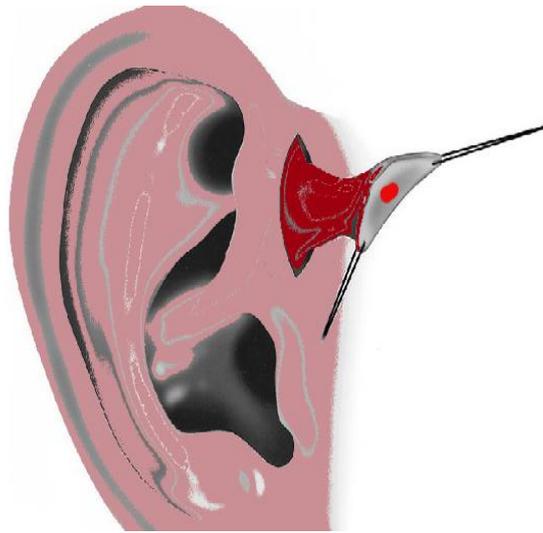
Procedure:

A small skin incision around the sinus is made.

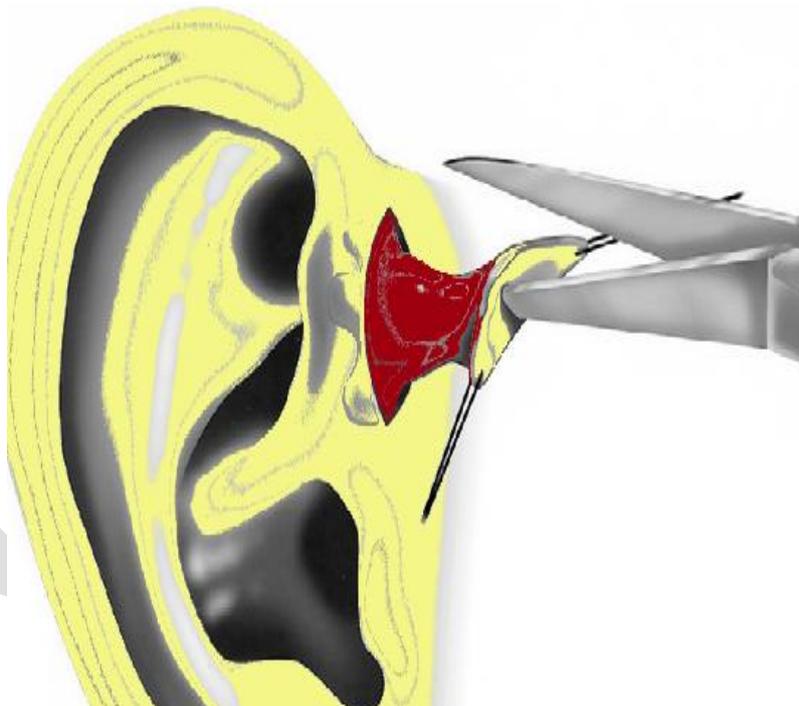


Figure showing the incision marked around the preauricular sinus opening.

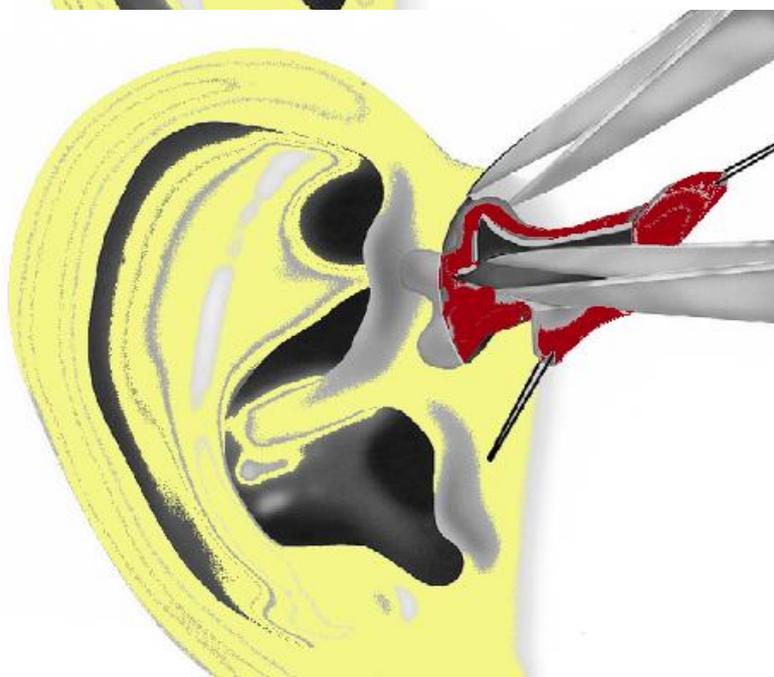
Stay sutures are placed to allow retraction of the tract to facilitate surgical extripation.



The sinus is opened using sharp scissors.



Under the glistening is inside and of the tract free from the tissue.



magnification lining which the outer wall are dissected surrounding

The main advantage of this procedure is that the sinus can be viewed and followed from both inside and outside. The classic procedure allows visualisation of the sinus from only outside. All the tracts are opened and followed until the dead end is reached. A lacrimal duct probe can be used to establish the direction of small tracts. It should be borne in mind that one of the tracts could be closely adherent to the perichondrium of the root of the helix / tragus. This piece of perichondrium along with a small bit of underlying cartilage should be resected along with the specimen. The medial limit of dissection is always the temporalis fascia. Before closure the wound bed should be carefully examined for evidence of residual tracts.

Causes of recurrence:

1. Major cause of recurrence is inadequate removal of the mass.
2. Performing the surgery without magnification aids
3. Skill of the operating surgeon. This is rather important because surgeons consider this case to be a minor procedure and hence pass it on either to a novice or junior surgeon who may not be experienced enough in performing this type of surgery.

Supra auricular approach:

This is a more radical approach. Major advantage of this approach is that it gives excellent exposure and hence removal of the sinus tract is nearly complete. This procedure has the lowest recurrence rate among all other surgical procedures for

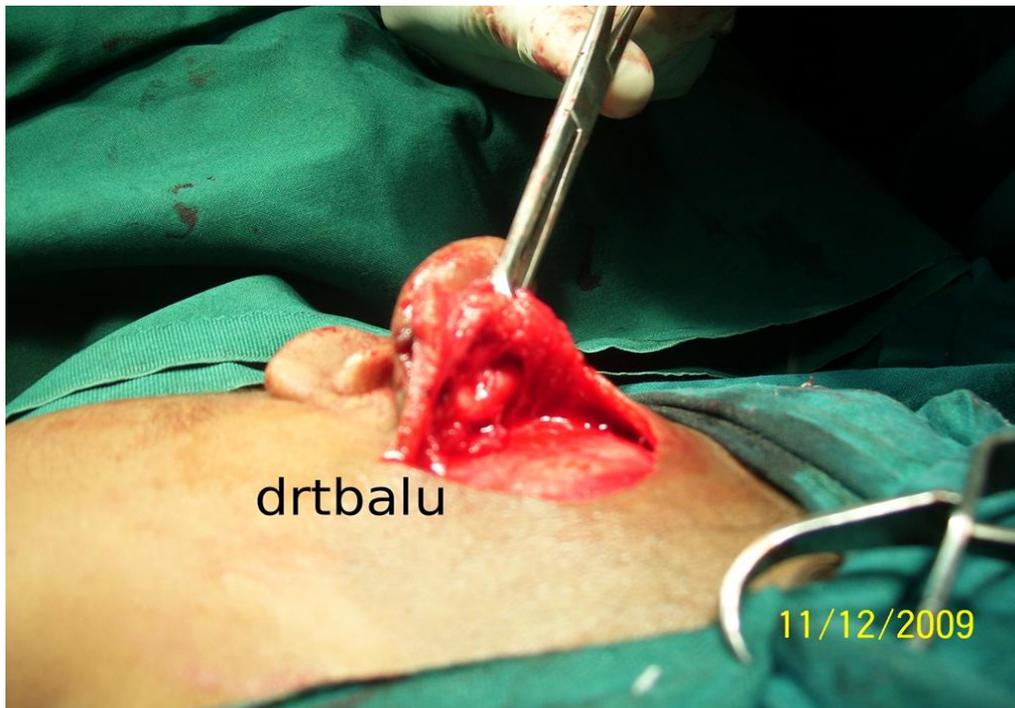
preauricular sinus removal.

This procedure involves a post auricular extension of the elliptical incision around the preauricular sinus opening. The incision is deepened till the temporalis fascia comes into view. This is supposedly the medial limit for resection in this procedure. All the tissue superficial to the temporalis fascia is removed together with the preauricular sinus. A portion of the cartilage along the base of the preauricular sinus should also be excised. The dead space should be closed in layers and compression dressing should be applied. A drain need not be placed here.



Figure showing incision for supra auricular approach

Figure



showing the bed after excision of preauricular sinus Note the cartilage of the helix after removal of the sinus



Wound closure after surgery