# Meatoplasty

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Introduction:

In advanced middle ear infections and cholesteatoma a canal wall down mastoidectomy needs to be performed with an intention of eradicating the disease process completely. At the end of canal wall down procedure meatoplasty need to be performed. Meatoplasty is performed to widen the external auditory canal and to make it continuous with the middle ear and mastoid cavity. Advantages of a wide meatoplasty include:

1. Provides adequate ventilation to the mastoid cavity and middle ear there by preventing bacterial growth. It also reduces conditions favorable for growth of pathogenic bacteria.

2. Debris accumulation can be easily identified during regular followup and cleaned.

3. It helps the surgeon in identification of residual / recurrent pathology in the middle ear and mastoid cavity

4. It supports rapid epithelialization and exteriorization of the mastoid bowl

One major draw back of a very large meatoplasty is that it could cause misshape the ear making it look rather unnatural. Therefore, a balance should be struck to create a wide enough meatoplasty to fulfill the ventilation requirements and it should not cause any distortion to the shape of the pinna.

Problems that need to be addressed by meatoplasty:

1. Projection of the anterior edge of the conchal cartilage into the posterior meatus

2. Excess underlying bone of the posterior bony meatus

3. Inadequate meatal skin circumference. This could predispose to stenosis leading to wound disruption and infection

Types of approaches used for meatoplasty:

1. Endaural approach

2. Retroauricular approach

Stacke Meatoplasty:

This uses the endaural approach. An inferiorly based posterior canal skin flap is created. A radial incision is given at 12 o clock postion cutting the posterior canal wall skin. A medial circumferential incision is given 2-3mm lateral to the ear drum. Lateral circumferential incision is provided through conchal skin. A strip of conchal cartilage is cut. Temporalis fascia flap should cover the entire facial ridge and inferior part of the cavity.

Surdille flap:

This flap uses endaural approach. Circumferential incision is given laterally in the external canal skin leaving a larger TM flap and a smaller lateral flap known as the Surdille's flap. The Surdille flap is pushed posteriorly into cavity and held in place by a BIPP pack. Superiorly, anterosuperior flap covers the attic and tegmen and inferiorly tympanomeatal flap covers the aditus and antrum.


Surdille flap

Korner Meatoplasty:

This meatoplasty can be performed either by endaural or post aural approach. If endaural approach is preferred then Lempert / Heerman II incision is preferred. In Heerman's incision two radial incisions are given in the external auditory canal at 6&12 o clock positions. A circumferential incision is used to joint these two incisions close to the ear drum.

These incisions divide the flap into medial tympanomeatal flap and a lateral korner's flap. The Korner's flap is pushed posteriorly into the surgical cavity and is held in position with a BIPP pack. Superiorly, anterosuperior flap covers the attic and tegmen, while inferiorly the tympanomeatal flap covers the aditus and antrum.

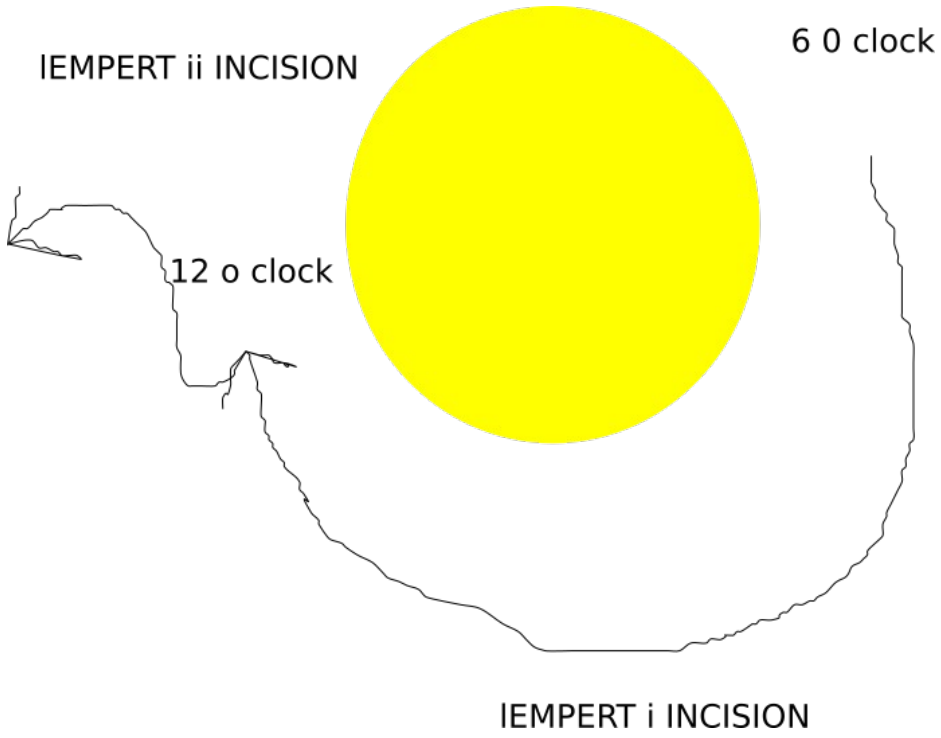



Image showing Lempert incisions

Farrior meatoplasty:

This meatoplasty is performed via endaural approach.  In this type of meatoplasty a conchal ear canal skin flap is created.

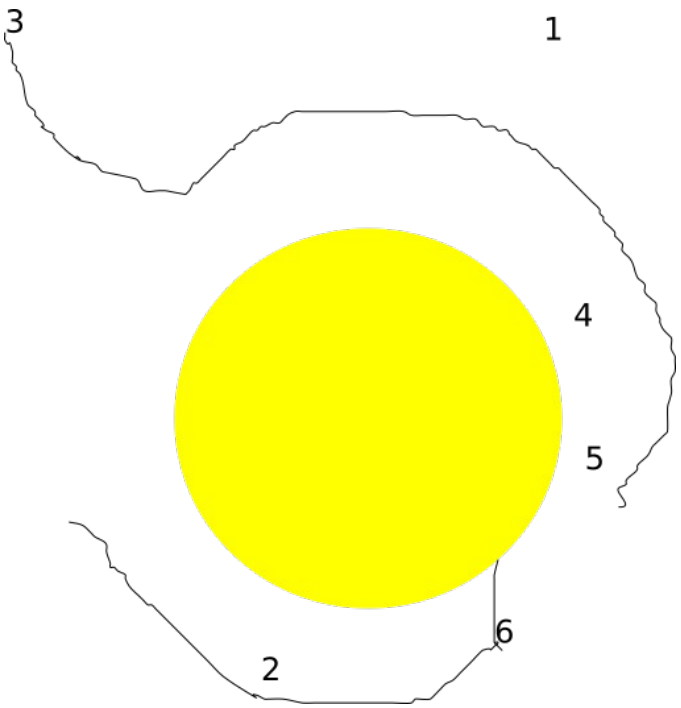



Image showing Farrior meatoplasty incisions:

1. Anterior circumferential incision at 4 o clock positions

2. Posterior circumferential incisions

3. Vertical incisions

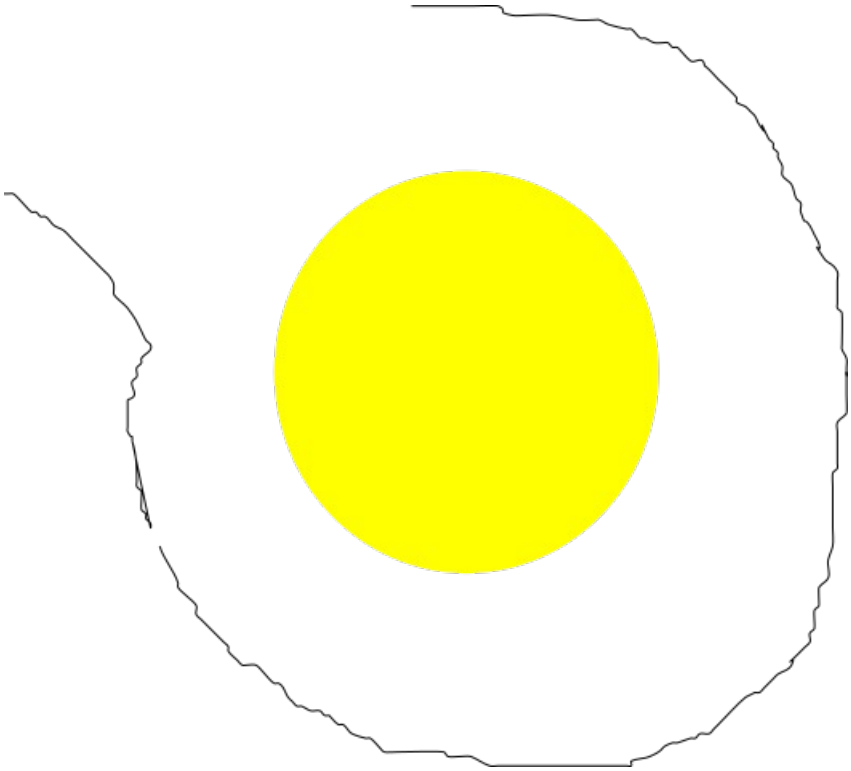
4. Anterior vertical incisions

5. Posterior vertical incisions

6. Lateral incision – This allows further elevation of skin

Fleury meatoplasty:

This type of meatoplasty is performed endaurally. It is a superior based vascular flap with a lateral circumferential incision starting at the 2 o clock position.



Fleury incision has two components. One circumferential incision to elevate tympanomeatal flap medially and a vertical incision at 10 o clock position as shown above

Large lateral flap of Surdile is created. This flap is made to cover the facial ridge & lower part of the mastoid cavity. The vertical incision (skin) is sutured first. It pulls the upper part of pinna further upwards.

Skin over the conchal cartilage is elevated and a strip of conchal cartilage is exposed. The conchal cartilage is resected leaving behind the perichondrium. The folded skin is sutured to cover the remaining exposed conchal cartilage.

Portman's small 3 flap meatoplasty:

This flap is created via post aural approach. Features of this meatoplasty are:

1. Three flaps are created i.e. lateral, superior, and inferior

2. There is no removal of conchal cartilage

3. Very useful for small cavities

4. Lateral circumferential incision from 12 to 6 o clock position is made 10 mm lateral to upper tympanic membrane

5. Upper lateral incision from the upper part of circumferential incision to the spine of Henle

6. Similar lower incision from inferior edge of circumferential incision towards the concha

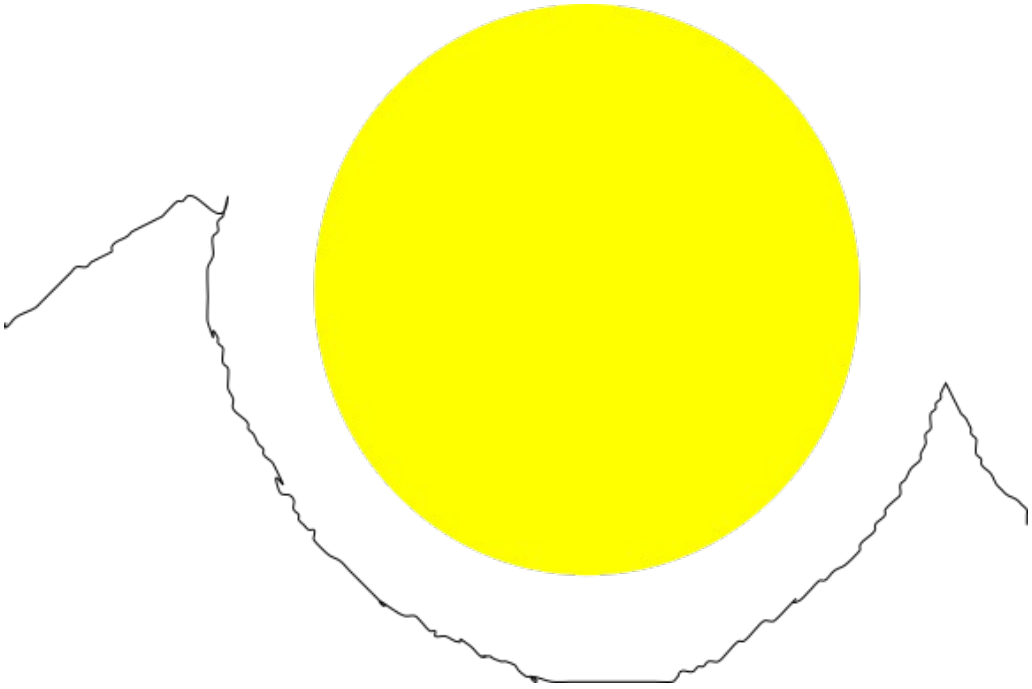


Image showing Portmann's incision

A finger is placed through the canal exposing the lateral flap. The flap is thinned out. When flap elevation is complete, the conchal cartilage would be visible. The flap is turned around the cartilage and fixed to posterior aspect of the cartilage. This flap will form lateral covering of the cavity and facial ridge.

Ear canal skin is divided at 9 o clock position up to the ear drum. This creates a superior flap which covers the superior part of the cavity and inferior flap which covers the facial ridge. Both these flaps need to be thinned out.

Portmann’s large 5 flap meatoplasty with removal of cartialge:

The ear canal skin is divided at 9 o clock position.

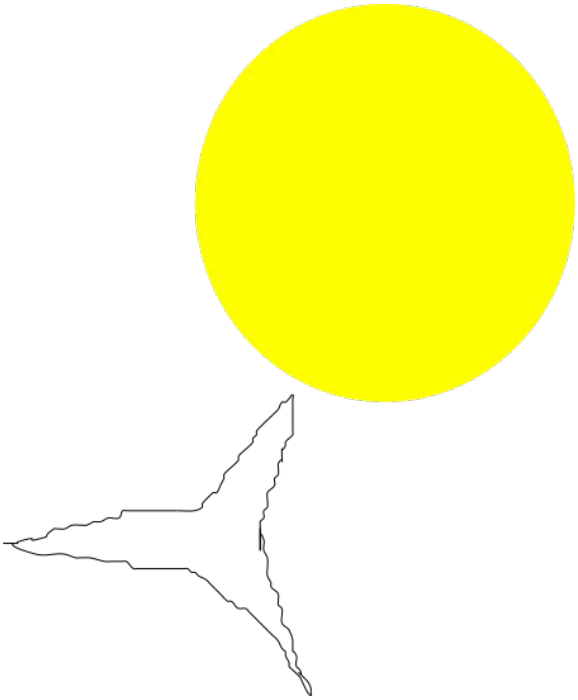


Image showing Portmann Y flap incision

Laterally at the conchal cartilage the following incisions are given:

1. One incision that turns infero anteriorly

2. One incision that turns supero anteriorly

This results in lateral, superior and inferior flap.

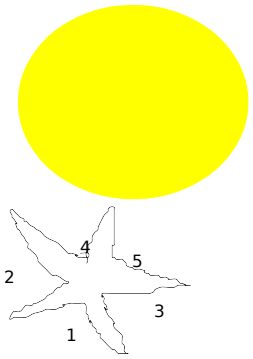



Image showing 5 flaps elevated

Superior and inferior flaps are further divided later. Conchal skin of lateral flap is elevated from the cartilage. A triangular piece of cartilage is removed. Skin from other two conchomeatal flaps are also elevated.

To facilitate mobility of these two flaps, a triangular skin is removed from their tips. A total of 5 flaps are created. The created flaps are thinned out and sutured to the posterior aspect of concha with a single suture. The cavity is packed with BIPP.

Sheehy Meatoplasty:

This again is performed via the post aural incision.

A vertical intercartilagenous incision at 12 o clock position is given parallel to the crus of helix. Another incision is made at 5 o clock position into the conchal cartilage. A horizontal incision passes backward at 9 o clock position through conchal skin, cartialge and post auricular soft tissue. This divides the lateral skin flap into superior and inferior. Through retroauricular approach the conchal cartilage is exposed and excised. The superior and inferior flaps are inverted onto the posterior aspect of remaining conchal cartilage.

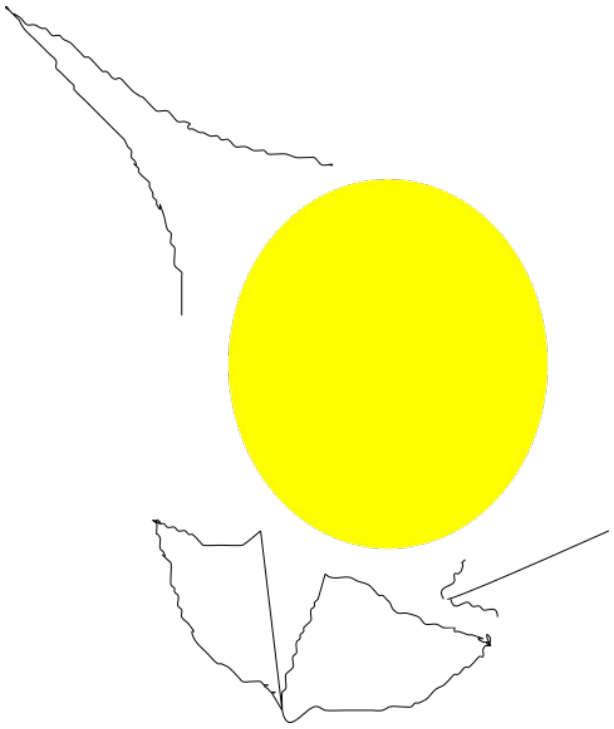


Image showing incisions used for Sheehy meatoplasty

1. A vertical intercartilaginous incision at 12 o clock position extending through skin, subcutis down to the bone.

2. Another incision at 5 o clock position into the conchal cartilage (indicated by the arrow)

3. Horizontal antero posterior conchal incision at about 9 o clock position creating two conchomeatal flaps.

Fisch meatoplasty:

This is also performed via post aural incision. One antero posterior incision is given over the conchal cartilage. The skin flap is elevated from the concha before resecting a major portion of the cartilage. The two liberated flaps are inverted posteriorly around the edge of the concha and sutured to posterior aspect of concha creating a meatoplasty.

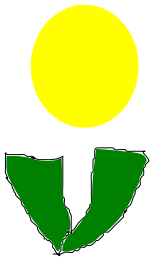


Image showing incision for Fisch meatoplasty.  The green shaded area indicates the amount of conchal cartilage that is usually removed.

Landolfi's modified Fisch technique:

An antero posterior incision is given.
Skin flap is elevated from the conchal cartilage
The conchal cartilage is exposed
Using scissors the conchal cartilage is resected including the anterior edge of crus of helix

The conchal skin is inverted to provide epithelial covering for the lateral wall of the mastoid cavity.

Palva flap:

This is actually a subcutis muscle clap.  This has a dual role of creating a wide meatoplasty and cavity obliteration.  This procedure is done via post aural incision.  The skin, subcutaneous tissue and periosteum are elevated and constitute a large palva flap.

Another incision is made along the entrance of the canal from 6 to 12 o clock through subcutaneous tissue and periosteum.

Meatoplasty is performed by turning the pinna backwards, making an intercartilaginous incision at 12 o clock position and an incision through conchal cartilage at 5 o clock position. Auricle is pulled forwards and a large strip of conchal cartilage is excised. Korner's flap is turned around resected conchal and palva flap is elevated.

A radial incision is made at 9 o clock position through the canal elevating an inferior and superior canal skin flap. After canal wall down mastoidectomy the modified palva flap is placed in the cavity attached anteromedially and infero anteriorly. This flap mainly obliterates the posterior part of the cavity and sinodural angle.