

# How I Do It: Perichondrial graft under-layer Myringoplasty

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## SURGICAL TECHNIQUE

The Ear canal is cleaned with betadine solution prior to the procedure. The skin is infiltrated with 1:200000 adrenaline solution after marking the incision. A preliminary examination under the microscope is performed to confirm the defect and refashion the perforation edges by removing a cuff of the perforation edge. The canal is also 'very slowly' infiltrated with the above solution using an insulin syringe until blanching of the ear canal is visualized.

A standard posterior auricular skin incision is made 2mm away from the post aurial crease and the incision is deepened.

Using a No. 15 blade the skin and soft tissue are carefully dissected away from the exposed cartilage while the skin flaps are retracted with fine skin hooks. A gauze swab is folded and placed under the pinna to facilitate this process. The choncal cartilage is thus exposed completely. The blade is then used to make a linear incision through the perichondrium. A canal elevator / Rosen elevator is then introduced between the cartilage and the perichondrium through the above incision. Perichondrial elevation is initially done with the Rosen elevator but later the blunt end of a Freer's elevator is used to elevate the graft similar to elevation technique in septoplasty. The standard graft is about 1.5cm x 1.5cm in area. The dissected graft is placed in normal saline.

The post auricular incision is then deepened to the mastoid bone cutting through the periosteum which is then elevated anteriorly towards the external auditory meatus. Canal elevation is done up to a depth of 1.25cm (Half of the length of the bony canal) and an incision is made in to the canal using a No. 15 blade. The canal incision is then widened using a sickle knife permeatally.

A loop of ¼ inch packing gauze is introduced through the external auditory canal and taken out through the above canal incision. The loop is cut, and the resultant 2 ends are used to secure the pinna anteriorly in 2 directions

Canal elevation is done using a fine sucker and Rosen elevator up to the annulus. Which is then elevated preserving the chorda-tympani nerve. The tympanomeatal flap is thus elevated from the 12 to 6 o'clock position and the middle ear cavity, ossicular continuity and Eustachian tube opening are inspected respectively.

The 'wet' perichondrial graft is then introduced in to the canal and manipulated under the tympanomeatal flap using a sickle knife and a fine sucker. The graft should ideally hug the elevated canal wall and tympanomeatal flap so that the middle ear cavity is also visible posteriorly. Additional manipulation can be done with the sickle knife making sure the anterior end of the perforation overlies the graft, thus covering the defect.

The tympanomeatal flap is replaced and plain gel foam is introduced to support the margins of the perforation and graft. A 'Pope' wick is inserted on top of this and soaked with gentamycin / ciprofloaxacin ear drops.

Routine layered closure is done with fine vicryl to subcutaneous tissues and to approximate the periosteum. Direct perichondrium to perichondrium suturing is also done. Skin closure is achieved with subcuticular 3/0 vicryl. A standard fine gauze dressing is then applied.

An 'elastoplast' cut in the form of a 'C' is placed over the gauze dressing and a mastoid head bandage is placed over it.

## DISCUSSION

Alternatively the skin can be infiltrated with 1:80000 Adreneline and lidocaine solution diluted 1 to 1 with distilled water.

Making the incision close to the pinna facilitates elevation of the pinna skin and exposure of the auricular cartilage. The number 15 blade can be used in a sweeping motion to quickly perform the soft tissue dissection.

Unlike other methods (E.g. the 'Tragal' cartilage harvest technique) a separate incision is not needed to harvest cartilage.

Sharp canal knives are not always available and thus the author prefers to use the no 15 blade externally to perform the canal incision.

Using the Freer's elevator prevents perforation of the graft during elevation. Using 2 loops instead of 1 helps protect the canal incision from tearing when traction is applied. Because the graft is relatively mouldable positioning it under the flap and getting it to adhere to the under surface of it, is relatively easy. During manipulation of the graft, nitrous oxide need not be switched off to facilitate placement, as the graft is relatively thick and does not bulge like temporalis facial grafts. Placement of gel foam in the middle ear cavity is usually not required in this technique.

If additional support is needed the perichondrial graft can be 'lifted' along with a piece of trimmed pinna cartilage which when placed with the graft in the middle ear cavity will support it medially.

For larger perforations (Subtotal perforations) the following techniques can be adopted additionally

1. Placing a cartilage 'wedge' in the Eustachian tube opening anteriorly (The cartilage can be harvested from the same site as the original graft)
2. Placing the graft medial to the handle of malleus
3. Anterior tunnelling via a low incision close to the annulus. (Since the graft is relatively thick)

An extended application of this graft is its usage in the lining of the mastoid cavity (Facilitated by its

natural curvature offered by the pinna). A large 3cm x 3cm graft can be harvested using the entire pinna if necessary.

Unlike in temporalis facial grafting, multiple grafts can be harvested from the same perichondrial site, during revision surgery, due to the regenerative nature of this particular graft.

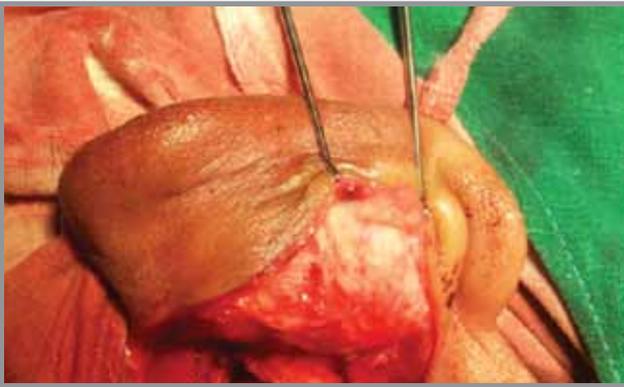
As an alternative for a 'Pope' wick a Tetracort™ wick can be inserted to support the graft at the end of surgery.

Subcuticular 'vicryl' skin closure prevents pinna irritation post operatively and removes the need of suture removal postoperatively. The entire post auricular surgical site can be covered by folding a single gauze swab at 2 points, saving dressing material. The 'C' shaped plaster protects the wound during initial dressing change. Usually a single suture is sufficient for the entire closure.

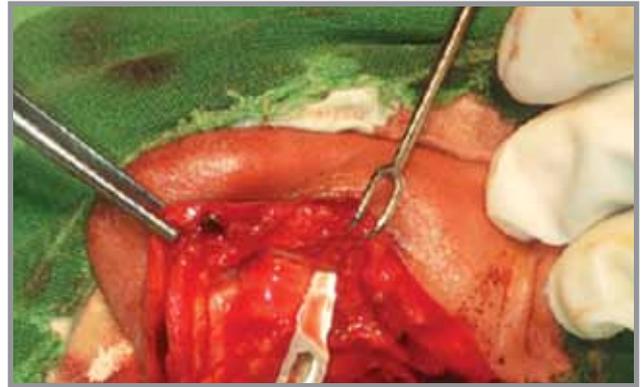
The mastoid bandage is kept overnight and the patient is observed for perichondrial haematoma postoperatively (We have never seen this since the introduction of this technique by the author in 2011 Jan).

The pope wick is removed in 2 weeks time and the 1st examination under microscope is performed in 1 month. A subsequent follow-up visit is usually scheduled at 3 months. Totalling the number of post operative visits to 3.

Although the success of this technique is currently being evaluated we have very encouraging initial results with regard to defect closure and hearing improvement.



*Skin hooks retraction of pinna skin*



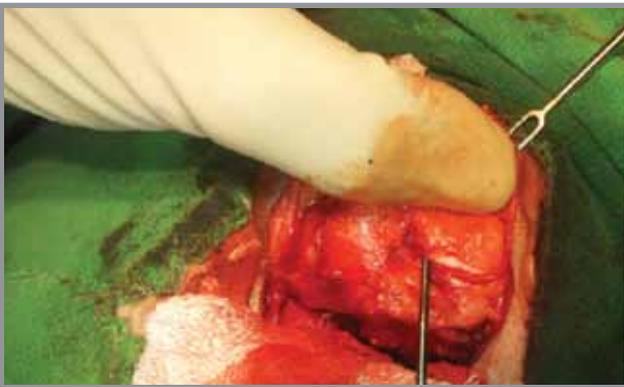
*Soft tissue dissection with a number 15 blade*



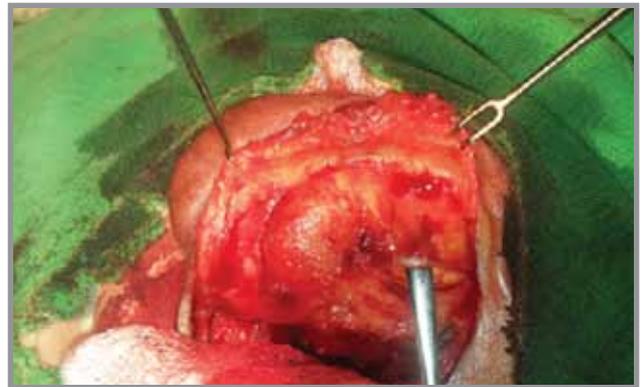
*Cartilage exposed*



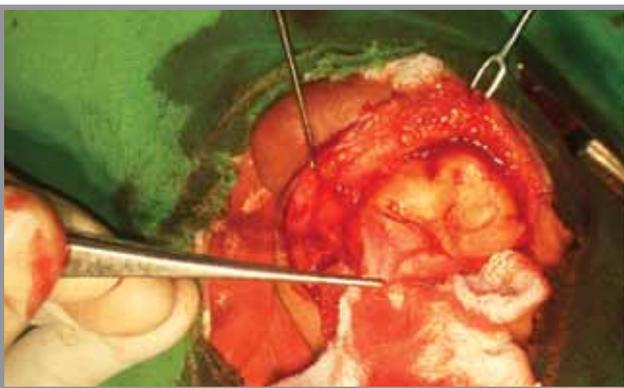
*Perichondrial incision with a number 15 blade*



*Perichondrial elevation with a canal elevator*



*Perichondrial dissection with a Freer's elevator*



*Graft separation with cartilage below*



*'C' shaped plaster at the end of the surgery*