

EDITORIAL

ENDOMEATAL MASTOIDECTOMY

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The cholesteatoma is predominantly an attic disease. With changing socioeconomic conditions, education and better surgical facilities, patient reports early to surgeon hence the size of the sac is becoming smaller, resulting in decreasing size of post operative cavity. Disease is usually limited to attic or up to antrum. Again cholesteatoma is in sclerotic bone which restricts its speed of proliferation. Our principle is to trace the disease, remove the sac in Toto and if exoneration of disease is complete/satisfactory, obliteration of cavity is done. If the cavity size is small and obliterated, just adequate size meatoplasty is required.

In canal wall up mastoidectomy we maintain the superior and posterior canal wall and in canal wall down technique aggressive saucerization of cortical edges of mastoid cavity with lowering of posterior and superior canal wall is done. In both procedures we take thorough care of mastoid air cell, infected

mucosa and complete exentration of disease. I prefer endomeatal mastoidectomy in clinically and radiologically smaller size cholesteatoma, tracing the track, continuously assessing the size while drilling the superior wall (tegmen).

As usual end aural incision is given into the canal in incisura termanilis between helix and superior border of tragus, incision is extended superiorly as and when required. The horizontal incision is given usually 4 to 5 mm medial to cartilagenobony junction extending posteriorly from 1^o clock to 6^o clock position laterally for 2mm. The periosteum is elevated and posterior cartilaginous part is retracted by the self retaining mastoid retractor. The horizontal incision is extended anteriorly up to 2^o clock position.

The canal skin in precious and healing depends upon its preservation, hence a pedicle flap is elevated in the canal. The incision begins 2mm lateral to annulus extending horizontally from 2^o



clock to 12^o clock and posteriorly up to 6^o clock position. Both anterior end of incision at 2^o clock position join by a vertical incision.. Flap is raised, reflected by house/flap knife taking utmost care not to injure the flap. No suction is used on flap, suction should be done at knife or Brackmann suction is used. The reflected flap is secured medially by a cotton ball or laterally in another retractor placed right angle securing the superior and inferior surface of canal wall soft tissue providing adequate exposure. On medial placement flap may be trapped in moving high speed drill while lateral placement flap may get lacerated by traction of frangs of mastoid retractor.

The tympanic cavity, attic is irrigated thoroughly, all debris cleaned. I prefer to irrigate the canal

approaching the attic and if bony hump in inferior and anterior canal is taken care of by canaloplasty but anterior inferior part of annulus is always preserved for better conductive hearing results. Usually a 2 to 3mm overhang is left superiorly over the scutum but certainly change of color of bone is secured. As we go medially size of the burr becomes smaller and smaller, but smaller than 3mm cutting burr is seldom required.

During skelotonization of superior wall for dura one must keep on observing the change of color of bone, it becomes pinkish, starts bleeding and change in noise which becomes high pitch. Surgeon has to train himself for three dimensional observations i.e. Visual, Tactile and Auditory.

At this stage cholesteatoma sac is reassessed and inferior border of scutum is drilled away with



with topical antibiotic solution, preferably 1% povidine iodine solution. The reason of irrigation is to make the field bacteria free specifically for collection of sterile bone pate which is to be used in post drilling obliteration of the cavity.

Drilling is started with adequate size cutting burr; preferably a size smaller than what surgeon prefers to avoid injury to surrounding structures, because all working is in compact area of dissection. Remember preservation of canal skin is key of early healing.

Author performs a type of wide superior and posterosuperior wall Canaloplasty before

3mm diamond burr or by cutting upward outward taking all precautions to preserve the sac intact. As soon as incus is visualized extra precaution is taken not to touch the long process of incus with vibrating burr which may result in high frequency sensorineural hearing loss.

Gradually drilling is advanced posterosuperiorly tracing the sac. If required incudostapedial joint is dislocated and head of malleus is removed after cutting the neck of malleus by malleus nibbler. Drilling of the anterior aspect of posterior canal wall up to the annulus is important, if cholesteatoma erodes the annulus posteriorly

then with 3.5mm diamond burr and profuse irrigation drilling may be done further medial in posterior wall of mesotympanum for about 1.0mm on the anterior aspect of fallopian canal to fully expose the facial recess which is bounded medially by promontory, laterally by fallopian canal, superiorly by ponticulus; a bony ridge between promontory and pyramidal eminence, inferiorly by subiculum; a bony ridge between posterior wall and round window niche. Until you clear the facial and tympanic recess (sinus tympani), one is not going to achieve the goal of dry cavity. If one is going to reconstruct the superior wall then our goal is to remove the disease/sac not to create a cavity, but certainly a self cleansing cavity or no cavity after obliteration, hence if entire sac removal is not a problem anterior and posterior buttress are preserved. While dissecting the posterior canal wall skelotonization is done from superior to inferior and medial to lateral side leaving no overhangs if one is not going to obliterate the cavity. Since we are working (drilling) on posterior canal from anterior to posterior side no significant landmarks are available. Our landmarks are chorda tympani and annulus. Facial nerve is about 2.0mm posterior to pyramid and at this level facial nerve is 3.0mm deep to chorda tympani and posterior buttress/notch of Rivinus. Facial nerve is always deep and posterior to upper two-third of annulus while at the postero inferior end of annulus, nerve may be encountered anterior or lateral to annulus.

Once the complete sac is removed drilling is further continued to remove all cells and infected mucosa specifically looking at sinodural angle, perilabyrinthine cells, retro facial cells and mastoid tip area. An attempt is made to polish the cavity like a pearl, which is going to provide and early healed trouble free cavity. If extensive work is required in breaking and polishing all septa of non infected air cells, they may be obliterated by bone pate collected earlier mainly

in the retro facial area, mastoid tip and sinodural area. Mastoid tip may be obliterated by conchal cartilage procured in meatoplasty and inferior canal wall widening. All bone pates should be covered by fascia graft.

If the cholesteatoma is reaching the tip, tip has to be obliterated up to the level of inferior canal wall for proper drainage and trouble free dry cavity. Inferior canal wall should always be lowered up to the tip. After doing the inferior canal wall Canaloplasty one must take sure to remove the inferior wall cartilage, failing which drainage is hampered, secretion stagnated and goal of dry trouble free cavity is defeated. It is always advantageous to thin out inferior canal wall even if cholesteatoma is not reaching the tip. After meatoplasty or canaloplasty, no part of cartilage is exposed, it may lead to perichondritis resulting in cicatrization and deformity of pinna.

I usually perform type III tympanoplasty. If the middle ear cavity is bleeding or mucosa is not healthy there will be fibrosis and retraction of graft and prosthesis is displaced defeating the results and hearing improvement will not be there. Hence preoperatively explained to patient and two stage surgery should be performed.

Though it is difficult to differentiate between residual or recurrence, but inadequate clearance of anterior attic, sinodural angle, mastoid tip area and inadequate drainage due to insufficient lowering of facial ridge results in recurrence.

I conclude in cholesteatoma cases when disease is suspected in attic or up to antrum disease should be followed, as it tracks in and minimum size self cleansing cavity with nice polishing can be performed endomeatally. I personally feel in beginners and inexperienced hands endomeatal mastoidectomy is safer, less time consuming and better rewarding technique.