Meatoplasty in a CWD Procedure Using an Endaural Approach: A Case Series of 31 Cases

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Received: 19 June 2014 / Accepted: 13 September 2014 / Published online: 21 September 2014
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Abstract A canal wall down, inside outside mastoidectomy requires an adequate meatoplasty for a dry outcome of the procedure. For an inside outside CWD procedure an endaural route is the best procedure. However the limitation in this approach is the meatoplasty. Thirty-one cases of unsafe disease with a sclerotic mastoid were taken up for an inside outside mastoidectomy using an endaural route. A procedure is described for the creation of a large adequate meatoplasty raising a posterior skin flap and removing the conchal cartilage via endaural route and the results discussed here.

Keywords Meatoplasty · Endaural · Inside outside mastoidectomy

Introduction

Meatoplasty is an operative technique to widen the lateral cartilaginous part of the external auditory canal. Meatoplasty is routinely performed as an integral part of mastoidectomy. It is typically performed at the end of the mastoidectomy to assist in ventilation and to provide easy access for cleaning of the cavity postoperatively. It is normally done in a retroauricular approach. However the meatoplasty technique in a case of endaural approach for an inside out CWD procedure is poorly developed as

compared to the current techniques used for meatoplasty via post auricular route. Meatoplasty in an endaural incision usually consists of adjusting the incision edges so that a relative wide opening forms. This is often inadequate when the mastoid cavity is large post operatively. Here we describe a technique for a meatoplasty in an endaural route while doing an inside outside CWD procedure.

Materials and Methods

Thirty-one patients underwent inside out mastoidectomy using an endaural approach from July 2012 to January 2014 at SMIH. Inclusion criteria were patients having unsafe disease with sclerotic mastoid. Exclusion criteria were safe CSOM, pneumatised mastoid or radiologic evidence of mixed cellularity. These 31 cases underwent inside outside CWD mastoidectomy using an endaural approach. At the end of the mastoidectomy a formal endaural meatoplasty was done. All the cases who had a sclerotic mastoid with unsafe disease and underwent inside outside surgery via an endaural approach were included in this study. All patients were planned and prepared to undergo inside out mastoidectomy under general anaesthesia via endaural approach using Lempert's endaural incision. Meatoplasty was done through the endaural route after completion of the mastoidectomy. In this procedure, a flap is developed by making incisions through the external auditory canal skin at 6 and 12 o'clock extending to the root of the helix and on to the inferior edge of the cymba concha (Fig.1). A superior incision is made at 12 o'clock and carried between the tragus and root of the helix. A skin flap is raised from the underlying cartilage and soft tissue (Fig.2). The conchal cartilage and the underlying soft tissue is widely excised. The long meatal skin flap (Figs.3,4) is

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Fig.1 Endaural incision marked

Fig.3 Elevated flap

Fig.2 Elevation of the flap from subcutaneous tissue and cartilage

Fig.4 Flap raised

repositioned over the raw area of the conchal bowl and tucked into the mastoid cavity and will constitute the back wall of the mastoid cavity (Fig.5). Cavity and meatus was then packed with BIPP packs and mastoid dressing was given. Dressing was removed after 2 days and packs after 3 weeks. Antibiotic coverage was given for 3 weeks. Follow up was done at 1 week for suture removal, at 3 weeks for pack removal, at 5 weeks for cavity inspection and then at 3 and 6 months for evaluation (Figs.6,7).

Results

Out of 31 patients, 31 cases were primary surgery with chronic discharging ears. There were 17 males and 14 females. Mean age of the patients at surgery was 25 years.

Fig.5 Intraoperative meatoplasty

Fig. 6 Post operative result

Fig. 7 Post operative result second case

All cases were done under general anaesthesia using endaural route using Lempert's endaural incision. Twenty-two cases became dry at the end of 2 months, whereas six cases took a total of 3 months to become dry (90.32 %). All the six cases were successfully treated with the ear becoming dry at the end of 3 months. Out of the 31 primary cases, two developed postoperative perichondritis that resolved with local care and oral antibiotics. Two cases developed granulation tissue which were managed by cauterization with 10 % trichloroacetic acid. Three patients complained of ear discharge at follow up at the end of 3 months out of which two were due to stenosis and were managed by doing the revision meatoplasty using a rotation of a pre-auricular flap under local anaesthesia. The other patient had otorrhoea despite adequate meatus size and other causes of otorrhoea were looked into.

Discussion

Giving the patient a well ventilated, dry, accessible mastoid cavity is one of the primary goals of cholesteatoma

surgery. Creation of an adequately large meatoplasty is a key component of CWD surgery. A large external auditory meatus allows ventilation of the mastoid cavity as well as easy access for examination and debridement of the entire cavity [1]. Numerous surgical techniques to prevent and correct meatal stenosis of the ear canal have been described [2–5]. Techniques of meatoplasty have included a combination of transposed skin flaps, removal of the conchal cartilage, removal of the cartilage from the tragus or floor of the ear canal, and use of conchomastoid sutures or meatal packing to maintain a large meatal diameter [6–8]. Some of the techniques were described by Anthony [9] and Hunsakar [4]. The majority of these techniques are by an endaural approach using a Lempert or Heerman A and B incisions, but are centered around surgery for curing meatal atresia and not for the inside outside mastoidectomy, where the primary goal is the ventilation of the mastoid cavity. Meatoplasty in an endaural approach for an inside out mastoidectomy is also done by Anthony's technique [9]. This involves closing the endaural incision while pulling the anterior edge superiorly and the posterior edge inferiorly, so that the tragus comes to lie 1 cm higher than before. The edges so sutured result in a relatively wider postoperative opening than the preoperative meatus. However, very often the final meatal opening by this technique is inadequate especially when the mastoid cavity is large causing the failure of surgery.

An ideal meatoplasty for preventing stenosis of the EAC should be simple to perform, reliable, give an adequate opening at all times and be cosmetically acceptable. The disadvantages of the existing techniques are that they are either excessively complicated or they fail to meet the need of removing both the excess cartilage and soft tissue to achieve a proper meatal widening. Also, in patients who underwent conventional meatoplasty, stenoses of the external ear canal opening is often seen. This stenosis of the meatus causes ventilation dysfunction, resulting in a wet cavity and also accumulation of debris in the mastoid cavity which at times gets secondarily infected [10]. As the bony work in an inside outside mastoidectomy is already done only the skin flap requires to be raised as described. The conchal cartilage from the cavum and the underlying soft tissue are removed with the skin flap repositioned over the raw surface and into the mastoid bowl. It is kept in place by packing for 3 weeks after which it is removed. The meatoplasty tends to contract a bit during healing, so the original size is required to be bigger than the final, so as to prevent a subsequent narrowing.

In a similar study by Tunkel [1] technique of meatoplasty is described with success rate of 87.5 % at 40 months post operatively. This study shows success rate of 90.32 % at 3 months post operatively. In this technique used, meatoplasty is done easily with advantage of

Table 1 Post op complications (n = 31)

	At 2 months	At 3 months	At 6 months
Dry ear	22	28	30
Ear discharge	9	3	1
Stenosis	Nil	2	Nil (revision surgery done)
Perichondritis	2	Nil	Nil
Granulations in EAM	2	Nil	Nil

removing the underlying soft tissue and cartilage according to size of cavity ,with no requirement of sutures, cosmetically acceptable with wide external auditory canal opening.

Adequacy of the meatoplasty was assessed by the capability to visualize the mastoid cavity. If the pinna had to be manipulated to view the cavity, the meatoplasty was considered inadequate (Table 1).

Conclusion

The majority of techniques for meatoplasty in an endaural approach are confined to surgery for lateral meatal stenosis. An endaural approach is a convenient approach to an inside outside mastoidectomy in an unsafe disease with a sclerotic mastoid. One of the major limitations is adequacy of the meatoplasty and the dearth of techniques for the same. This approach can be an effective treatment modality in maintaining a large EAC and in improving the cosmetic outcome with minimal risk of complications.

Conflict of interest None

Financial disclosure There are no financial interests the authors have in companies or other entities that have an interest in the information in the Contribution.

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