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Paediatric small cavity mastoid surgery: planned second look tympanotomy

P.J.D. Dawes*, M. Leaper

Department of Otorhinolaryngology, Head and Neck Surgery, University of Otago, Dunedin, New Zealand

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1. Background

Canal wall down mastoidectomy (CWDM) exteriorises cholesteatoma/retraction pocket disease allowing provision of a "dry, safe" ear, which can be inspected and toileted at intervals. Small cavity, low facial ridge, mesotympanic seal and adequate meatoplasty reduce the risk of aural discharge [1].

Intact canal wall mastoidectomy (ICWM) avoids an open cavity but is complicated by residual disease occurring in 20–40% of cases [2,3], usually found within the posterior mesotympanum and attic [4]. Increased interest in ossiculoplasty following both CWDM and IWDM for cholesteatoma/retraction pocket disease increases the chance that the posterior mesotympanum is sealed by a grafting to the facial nerve/ridge. CWDM, as with ICWM, can result in an obscured posterior mesotympanum with potential for hidden residual disease. This has led the senior author to second look selected cases following small cavity mastoid surgery (Fig. 1).

2. Method

A retrospective review of a personal surgical database for small cavity mastoid surgery performed between 1993 and 1999 for children with cholesteatoma or actively discharging

* Corresponding author. ENT Department, University of Otago, Dunedin Hospital, 201 Great King Street, Dunedin, New Zealand. Fax: +64-34747956.

E-mail address: patrickd@healthotago.co.nz (P.J.D. Dawes).

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Small Cavity Mastoidectomy
Indications for Second Look Tympanotomy

- Cholesteatoma / retraction pocket involves oval window niche or sinus tympani.
- Suspected incomplete removal of disease.
- Marked mucosal oedema in oval window niche.

Fig. 1. Small cavity mastoidectomy. Indications for second look tympanotomy.

retraction pocket disease. Comparison is made with a small number of children referred for revision mastoidectomy.

3. Results

Fifty children underwent small cavity mastoid surgery; five were lost to follow up within 6 months (Table 1). Twelve (27%) were recommended planned second look tympanotomy. Ten underwent second look and all were free of residual disease (Table 2). One underwent EUM with no evidence of residual disease and one has not had the second look performed. Of six children referred for revision mastoidectomy, either because of cholesteatoma or persistent cavity discharge; three had cholesteatoma within the posterior mesotympanum, in two children the disease being wholly obscured by the grafted tympanic membrane.

4. Discussion

Following ICWM for cholesteatoma/retraction pocket disease residual disease occurs in 20–40% [2,3] of children with an average of about 30% [5], being most common in the attic or mesotympanum. Proponents of CWDM argue that residual disease is less likely when the attic is exteriorised and that canal wall removal facilitates access to the posterior mesotympanum. Residual disease for CWDM is estimated at 10–12% [5]. Roger et al. [4] analysed the risk of residual cholesteatoma following CWDM and ICWM, they concluded that the risk of middle ear residual disease was similar for ICWM and CWDM. Posterior

Table 1

Primary surgery ($n=45$)	
□ Sex, M/F	28:17
□ Age	3–15 years (mean 10 years)
Procedure	
□ Tympanoplasty	13
□ Epitympanotomy ± reconstruction	5
□ Atticoantrostomy	2
□ Modified radical mastoidectomy	11
□ Modified radical mastoidectomy with mastoid tip removed	14

Table 2

Second look tympanotomy ($n = 10$)			
Middle ear findings (n)		Other pathology (n)	
□ No residual disease	→ 10	□ Sinodural angle cells	→ 1
□ Adhesions	→ 4	□ Myringitis	→ 2
□ Myringostapediopexy	→ 6	□ Neo-epitympanic scar formation	→ 1
□ Ossiculoplasty	→ 2	□ Cavity pearl	→ 1

mesotympanum involvement, ossicular chain interruption, surgical inexperience and presumed incomplete disease removal were independent factors correlated with residual disease. Opacity of the repaired tympanic membrane can make examination of the posterior mesotympanum impossible. In this situation, only a planned second look can reliably confirm disease clearance.

We found that 27% of children warranted second look tympanotomy, reinspection of 10/12 of these confirmed disease clearance. An aggressive approach to management of the posterior mesotympanum as part of small cavity surgery can ensure clearance of primary disease. Staged ossiculoplasty is feasible, but when a cavity is created that involves opening of the facial recess and extensive facial ridge lowering in the presence of an intact stapes, then there is a high chance that a myringostapediopexy will form after the initial procedure.

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