

Outcomes of examination under anaesthesia of post-nasal space and grommet insertion in adults presenting with otitis media with effusion

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Main Article

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Abstract

Background. In adults, otitis media with effusion causes considerable morbidity and has poorly established outcomes. A small number of nasopharyngeal carcinoma patients present with isolated ear-related symptoms. The investigation of choice for these patients is a point of debate.

Methods. A retrospective cohort study was conducted using a local database of adult patients who underwent examination under anaesthesia of the post-nasal space with grommet insertion for otitis media with effusion between January 2014 and January 2016.

Results. Ninety-eight patients met the inclusion criteria. Follow-up duration ranged from 39 to 63 months. Complications of grommets were present in 36 out of 98 patients (36.73 per cent). The findings of examination under anaesthesia of the post-nasal space were documented as abnormal in three patients. No patient was diagnosed with nasopharyngeal carcinoma.

Conclusion. Grommets in adults with otitis media with effusion as the sole presenting feature carry a high complication rate, especially in those with previously inserted grommets. Examination under anaesthesia of the post-nasal space offers a low yield. A magnetic resonance imaging scan of the post-nasal space may be a more sensitive alternative.

Introduction

In adults, otitis media with effusion (OME) is less common than in children but is not without considerable morbidity.¹ Otitis media with effusion in adults can be associated with sinonasal disease, reflux, Eustachian tube dysfunction and malignancy in the post-nasal space.¹ Incidence of malignancy in patients with OME as the sole presentation varies greatly between countries where nasopharyngeal carcinoma (NPC) is endemic (5.5 per cent)² and non-endemic like the UK (0.4–1.4 per cent).^{3,4}

Aural symptoms (e.g. tinnitus, impaired hearing) are present in 62.2 per cent of patients with NPC. The correlation of OME with NPC has led to examination of the post-nasal space being recommended as part of investigations of adults with OME.⁴ However, this recommendation has been questioned by other authors from non-endemic areas.^{3,5–7} Given this controversy, we conducted a systematic literature review to identify alternative investigative modalities for adult patients with OME that we could implement in a new management protocol.

Data on outcomes in adults with OME are not as established as in children, who generally have a favourable outcome. This is especially the case in adults with NPC who have been shown to have worse prognosis in terms of complications.⁸ The same authors reported on the outcome of ventilation tubes in adults without NPC and with OME in the 15–18 months after insertion. Persistent discharge was present in 4 out of 53 patients (7.5 per cent), and there was recurrence of OME in 19 out of 53 patients (35.8 per cent).⁸ Another study investigated the outcome of ventilation tubes in those aged over 15 years compared to younger patients. Otitis media with effusion was bilateral in 30 per cent of the younger group, whereas it was 8 per cent in the adult group. The younger group was also 20 times more likely to recover spontaneously (40 per cent, compared to 2 per cent).⁹

This paper presents the rate of complications, and describes our experience in terms of surgical outcomes of examination under anaesthesia of the post-nasal space and grommet insertion in adults presenting solely with OME.

Materials and methods

Ethical considerations

This study received approval from the local clinical research and audit committee. Patients' data were anonymised and stored securely.

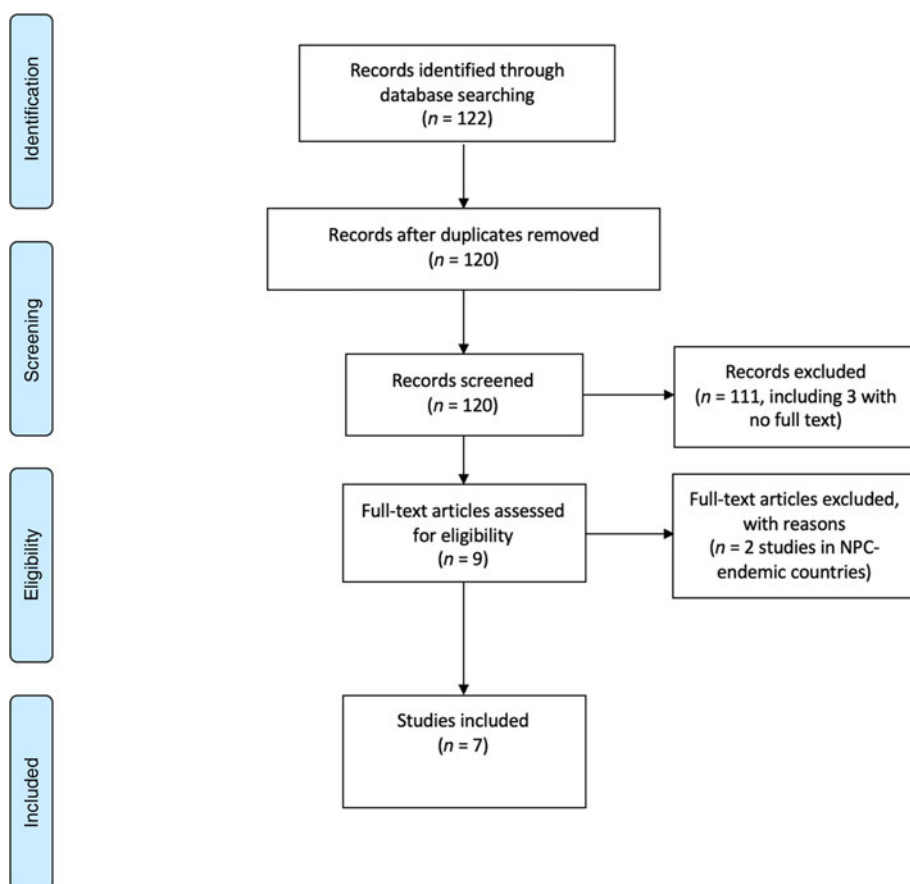


Fig. 1. Preferred Reporting Items for Systematic Reviews and Meta-Analyses ('PRISMA') flow diagram of the literature review. NPC = nasopharyngeal carcinoma

Literature review

A systematic review of PubMed literature was performed on 14 of November 2020 using a combination of the two search terms: 'nasopharyngeal carcinoma otitis media with effusion' and 'adults unilateral otitis media with effusion'. Non-English language articles, articles on patients aged less than 19 years, those published before 1980, review articles, case reports and animal studies were excluded. The search of the first term returned 64 articles and the search of the second term returned 62 articles. The results are presented in a modified Preferred Reporting Items for Systematic Reviews and Meta-Analyses ('PRISMA') flow diagram (Figure 1).¹⁰

Subjects

This retrospective cohort study was conducted using a local database of adult patients who underwent examination under anaesthesia of the post-nasal space with unilateral or bilateral grommets, between January 2014 and January 2016, for otitis media with effusion. Patients who underwent grommet insertion for Ménière's disease or for recurrent acute otitis media were excluded.

Data collected

The data collected included patients' demographics, presenting complaints, any subsequent head and neck radiological studies, outcome and complications of grommet insertion, and outcome of the examination under anaesthesia of the post-nasal space.

We also compared the number of examinations under anaesthesia of the post-nasal space recorded nationally¹¹ compared to our local data.

Results

Patient demographics

A total of 103 consecutive adult otitis media with effusion (OME) patients were scheduled for examination under anaesthesia of the post-nasal space and ventilation tube insertion between January 2014 and January 2016. Follow-up duration ranged from 39 to 63 months. Two patients were excluded as they had T-tubes instead of grommets. Three further patients were excluded because of missing data, which prevented meaningful analysis. The following analysis was conducted on the remaining 98 patients.

Table 1 highlights patient demographics and presenting symptoms.

Surgical outcomes and grommet complications

Table 2 details complications of the grommets, which were present in 36 out of 98 patients (36.73 per cent). Six patients of the thirteen with persisting hearing loss were fitted with hearing aids with no further problems.

Of the 27 patients who had recurrence of OME after grommet extrusion during the follow-up period, 15 (55.56 per cent) were re-scheduled for further ventilation tube insertion, with some of them having T-tubes. Of these 15 patients, 7 (46.67 per cent) had further complications; 1 patient had infections followed by blockage, and the other 6 had either infections (3 out of 15) or blockage (3 out of 15). For the remaining 12 patients who re-presented with OME and did not have further ventilation tubes, 4 were referred for hearing aids, another 4 had no documented action, 2 agreed on no further action, 1 was scheduled for further grommet insertion but did not attend and in 1 patient the OME resolved spontaneously.

Table 1. Patients' demographics and presenting symptoms

Parameter	Value(s)
Sex (<i>n</i> (%))	
– Females	40 (40.82)
– Males	58 (59.18)
– Total	98 (100)
Age (years)	
– Median	62
– Range	18–90
Patients who underwent radiological investigations (<i>n</i> (%))	19 (19.39)
Side of grommet(s) (<i>n</i> (%))	
– Left	36 (36.73)
– Right	38 (38.78)
– Bilateral	24 (24.49)
Presenting complaint (<i>n</i> (%))	
– Hearing loss	84 (85.71)
– Blocked ear or pressure in ear	11 (11.22)
– Others	3 (3.06)

Examination under anaesthesia outcomes

Findings of the examination under anaesthesia of the post-nasal space in OME adult patients were documented as abnormal in three patients: 'enlarged adenoids' in the first patient, 'oedematous tissues' in the second and 'bulky tissues look inflammatory' in the third. Biopsies were taken from these three patients and from one patient with normal post-nasal space (by random sampling of apparently normal tissue).

No patients re-presented to ENT at a later date with post-nasal space pathology during the follow-up period of this study.

Flexible nasoendoscopy was documented as performed in clinic in 50 out of 98 patients (51.02 per cent). The flexible nasoendoscopy findings were abnormal in only four patients: the first patient had fullness in the superior aspect of the post-nasal space, the second had adenoid remnants, the third had post-nasal space erythema and rhinitis, and the fourth had laryngeal Reinke's oedema.

In England, in the year 2018–19, examination under anaesthesia of the post-nasal space was performed in 1979 adults (aged 18 years and older). Fewer than a quarter of these were carried out as day-case procedures.¹¹ There are 126 ENT units in England, meaning that an average of 15 examinations under anaesthesia of the post-nasal space took place in each unit in one year. In our unit, it stands at 50 procedures per year.

A protocol for investigating patients with OME as the sole presentation was suggested as a result of this study, and was approved for use in our hospital (Figure 2).

Discussion

Literature review

Seven studies were included in the final analysis.^{2–4,7,12–14} Glynn *et al.* recommend the need for close follow up with serial flexible nasoendoscopy in those with a normal post-nasal space.⁷ Abu-Ghanem *et al.* recommend magnetic resonance imaging (MRI) even in patients with an apparently normal post-nasal space, given the risk of cancer with submucosal spread.⁵ The

Table 2. Complications of grommets

Complication	Value(s)
No improvement (<i>n</i> (%))	15 (15.31)
– Hearing loss (<i>n</i>)	13/15
– Tinnitus (<i>n</i>)	1/15
– Crackling & pain (<i>n</i>)	1/15
Infection (<i>n</i> (%))	16 (16.33)
– CSOM (<i>n</i>)	4/16
– Others (<i>n</i>)	12/16
Blockage (<i>n</i> (%))	9 (9.18)
Further GA for grommet removal (<i>n</i> (%))	9 (9.18)
– Removed because of recurrent or persistent infection (<i>n</i>)	6/9
– Removed because grommet blocked (<i>n</i>)	2/9
– Removed because of symptom worsening (tinnitus) (<i>n</i>)	1/9
OME recurrence (<i>n</i> (%))	27 (27.55)

CSOM = chronic suppurative otitis media; GA = general anaesthesia; OME = otitis media with effusion

same group suggested that the MRI scan could offer a cost-effective alternative to biopsy of the post-nasal space.¹²

Other authors recommend radiological investigations in adults with otitis media with effusion (OME) lasting more than two months, although the type of radiological investigation is not universally agreed.¹⁵ This is supported by studies from non-endemic areas on adult patients with unilateral OME and a normal post-nasal space, but with abnormal cross-sectional radiological evaluation findings.^{13,14}

Grommet complications in adults

Our study demonstrates the relatively high complication rates associated with grommets in adult patients with isolated OME. Moreover, it shows that OME in this cohort appears to have a different natural history, with considerably less spontaneous resolution,⁹ and with a different spectrum of complications than in children.^{8,16} The complication rate is even higher in patients who underwent grommet insertion to treat recurrence of OME after the extrusion of a previously inserted grommet. In this subgroup of patients, other solutions may be better, such as hearing aids or balloon dilation Eustachian tuboplasty.

The rate of OME recurrence in our study cohort was lower than that reported in the literature.^{8,17} However, one of these studies took place in a country where nasopharyngeal carcinoma is endemic, and included a large number of patients with head and neck cancer.¹⁷ The rate of otorrhoea in our study was higher than that reported in a non-endemic country,¹⁶ but lower than that reported in an endemic one.¹⁷

Fifteen patients reported no improvement in their symptoms, mainly hearing loss, following grommet insertion. This could be related to the presence of other causes of conductive hearing loss, such as tympanosclerosis, scarring and erosion of the long process of the incus.

In view of the considerable complication rate, it is important to discuss the risks openly with patients. This study offers quantification of the risks, which can be used as part of the consent process and to inform shared decision-making.

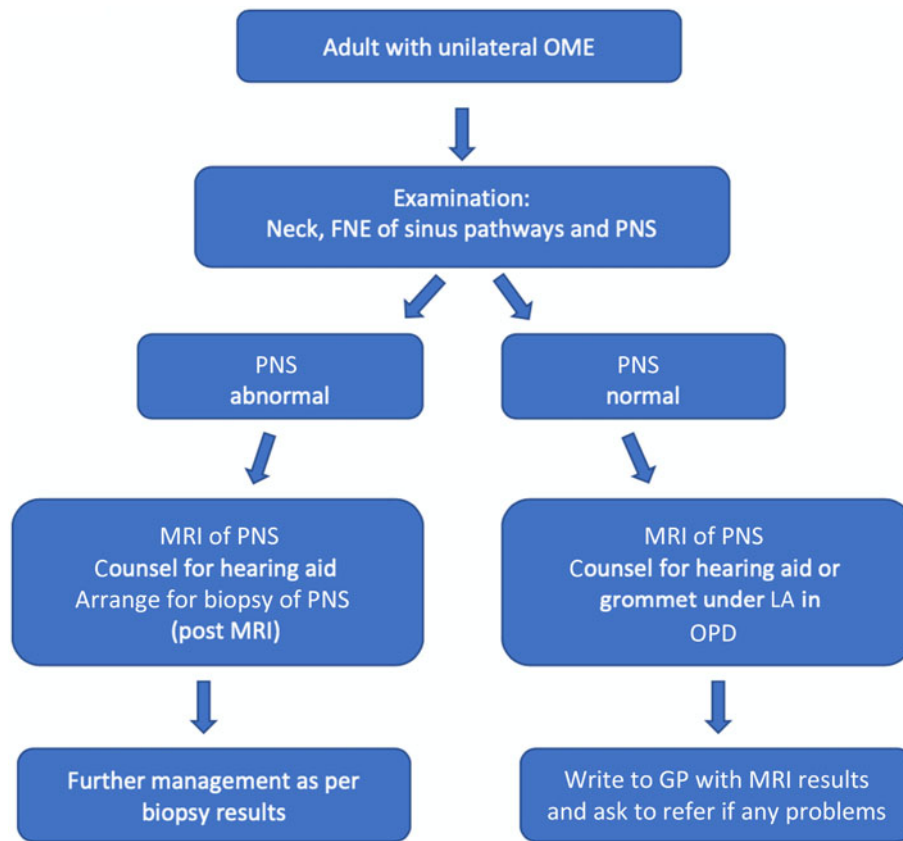


Fig. 2. A protocol for management of adult patients with unilateral otitis media with effusion (OME). (Written by H Mohammed (supervising consultant: P Yates); date February 2020, review date February 2021.) FNE = flexible nasoendoscopy; PNS = post-nasal space; LA = local anaesthesia; MRI = magnetic resonance imaging; OPD = out-patient department; GP = general practitioner

- In adults, otitis media with effusion causes considerable morbidity and has poorly established outcomes
- Over one-third of adults develop complications following grommet insertion for isolated otitis media with effusion (OME), with an increased complication rate with further grommets
- Hearing aids should be considered in OME patients given the relatively high complication rate and recurrence risk
- Examination under anaesthesia of the post-nasal space with biopsy has a very low yield and alternative investigation modalities should be considered
- The evidence-based complication rate helps in informed decision-making

Examination under anaesthesia

Our results support the low yield of examination under anaesthesia of the post-nasal space in patients presenting solely with OME, in accordance with previous studies.^{3,5-7}

Moreover, recent studies from endemic countries show that MRI offers significantly higher sensitivity than flexible nasoendoscopy in investigating the post-nasal space, and non-significantly higher sensitivity than endoscopic biopsy of the post-nasal space.¹⁸ Previous case reports have highlighted that post-nasal space malignancy presenting with OME can nevertheless show a normal post-nasal space on flexible nasoendoscopy.¹³ Thus, a 2015 study from a non-endemic country advocates using MRI to reveal submucosal cancers in the apparently normal post-nasal space.⁵

In our unit, the number of examinations under anaesthesia of the post-nasal space is higher than the national average,¹¹ at 50 per year. This could be simply because of the population size, or the tendency to carry out examinations under anaesthesia of the post-nasal space in patients who choose to go down the route of grommets inserted under general anaesthesia (GA) when they present with OME.

In the presence of a relatively inexpensive and high-quality MRI scan, the need for examination under anaesthesia of the

post-nasal space is debatable, especially when factoring in coronavirus disease 2019 risks and the inconvenience of GA for patients, including a longer interruption to work and the need for an overnight stay in some cases.

Our new management protocol recommends an MRI scan even in the presence of a normal post-nasal space on flexible nasoendoscopy. This is because of the possibility of deeper lesions, such as submucosal carcinomas and parapharyngeal space lesions, that could be responsible for the OME, and for which MRI has greater sensitivity than examination under anaesthesia of the post-nasal space, as discussed above. The new protocol also recommends requesting the MRI on the first visit rather than following a three month 'watch and wait' period, as most patients have already waited three months prior to the appointment.

Limitations

Limitations of this study include the retrospective collection of data. We have also assumed that patients who did not present back to our centre with complications or recurrence were not presenting elsewhere or lost to follow up, meaning that our figures may underestimate the rates of complications and recurrence. Finally, the number of documented flexible nasoendoscopy examinations in clinic is lower than expected, and prevents conclusions being drawn on sensitivity and specificity for post-nasal space malignancy compared with examination under anaesthesia and radiological imaging.

Conclusion

Grommets in adults with otitis media with effusion (OME) as the sole presenting feature carry high complication rates, especially in those with previously inserted grommets.

Awareness of the incidence and nature of grommet complications in adults is important for reaching shared informed decisions when counselling patients for grommet insertion. Further research is needed to evaluate factors that could be responsible for OME recurrence in this group of patients.

If not opting for grommets, there is low yield from examination under anaesthesia of the post-nasal space. We propose that alternatives are considered, such as MRI, which may be superior and more cost-effective.

Competing interests. None declared

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