Indications for tonsillectomy: the evidence base and current UK practice

Tonsillectomy is one of the most common surgical procedures, and nearly two thirds of those performed annually in England and Wales are paediatric cases. Over the years the associated complications have not changed and the indications continue to be controversial. This article looks at the evidence base for current UK practice.

Tonsillectomy was widely practiced in the western world as a procedure to cure a vast range of conditions from respiratory tract infections to chronic systemic diseases throughout the 20th century (MacBeth, 1950; Kornblut, 1987). A greater awareness of the natural history of respiratory tract infections, the introduction of antibiotics, implementation of more stringent selection criteria and sociocultural changes are all thought to have contributed to a decline in the popularity of the procedure and realization that indiscriminate tonsillectomy can no longer be justified (Younis and Lazar, 2002; Smith and Pereira, 2007).

In the UK currently, the most widely used guidelines on tonsillectomy are those issued by the Scottish Intercollegiate Guidance Network (SIGN) (1999) (*Table 1*). These are grade C recommendations, meaning that although direct scientific evidence from meta-analysis and randomized controlled trials for these recommendations is lacking, they represent the current available evidence from less robust but still good quality studies.

Traditionally recurrent tonsillitis has been the main indication for tonsillectomy. However, for the paediatric population the indications are rapidly evolving to recognize and include the role of tonsillectomy (with or without adenoidectomy) in paediatric sleep-disordered breathing (Smith and Pereira, 2007). The American Academy of Otolaryngologists-Head and Neck Surgery (2000) recommendations state that tonsillectomy should be considered for children with 'three or more tonsillar infections a year' and that children 'with a sleep disorder should be candidates for removal or reduction of the enlarged tonsils'.

Table 1. Summary of the Scottish Intercollegiate Guidance Network guidelines

Patients should meet all of the following criteria to be considered for a tonsillectomy for recurrent infections:
Sore throats are the result of tonsillitis
Five or more episodes of sore throats per year
Symptoms last for at least 1 year
The episodes of sore throat are disabling and prevent normal functioning

From Scottish Intercollegiate Guidance Network (1999)

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Indications and evidence base for tonsillectomy

The main indications for tonsillectomy are:

- Recurrent tonsillitis (infective)
- Sleep-disordered breathing or obstructive sleep apnoea
- Tonsillar asymmetry (suspected neoplasm).

Recurrent tonsillitis

Recurrent tonsillitis (*Figure 1*) remains one of the main indications for tonsillectomy despite a lack of high quality scientific evidence for its efficacy (Marshall, 1998; van Staaij et al, 2005). A Cochrane review by Burton et al (2000) concluded that there is no evidence from randomized controlled trials to guide clinicians in formulating clinical guidelines in children or adults.

Tonsillectomy was considered to be curative for recurrent infections in the early 1900s; these conclusions, however, were based on studies that were of doubtful validity because of poor design, non-randomization, inconsistent data collection and analysis (Darrow and Siemens, 2002).

Figure 1. Acute tonsillitis.

In the 1970s and 1980s a series of trials attempted to rectify this lack of scientific evidence. Two parallel prospective trials were reported by Paradise et al (1984). In one trial patients were randomized into surgical and non-surgical arms and in the second parental preference was used to decide on the treatment arm (i.e. non-randomized). Stringent inclusion criteria were used for both studies: all cases had evidence of clinically well-documented 'throat infections' at least seven episodes in 1 year, five episodes a year for 2 years, or three episodes a year for 3 years (Paradise et al, 1984). Roughly the same number of patients were recruited in both the randomized (91 patients) and non-randomized trial (96 patients). A reduction in the number and/or severity of throat infections was used as the outcome measure.

The results for the first 2 years of follow up showed a significant reduction in the incidence of recurrent infections in the surgical (tonsillectomy) arms *vs* the control groups ($P \leq 0.05$); and in the third postoperative year a better outcome in the surgical arms of both trials was reported but this was not statistically significant (Paradise et al, 1984). These trials have been criticized for poor randomization, with severely affected patients being transferred to the surgical arm on parental request, thus potentially underestimating the benefits of tonsillectomy. Children having adenoidectomy as well as tonsillectomy were included, making it impossible to exclude this as being relevant to the ultimate outcome. Additionally the role of active non-surgical treatment in the control group remains unclear. Paradise et al (1984) concluded that a decision for tonsillectomy should be tailored for each individual patient, taking into consideration potential benefits and risks.

The same group (Paradise et al, 2002) subsequently carried out a further two parallel randomized controlled trials comparing surgery with non-surgical management for children with a history of recurrent episodes of throat infections. The inclusion criteria for these trials, although more complex, were less stringent than the original trials reported in 1984 and were considered to be a better reflection of accepted practice. It must be stressed that this study looked at less severely affected patients and that many children included in this trial would not have fulfilled the criteria outlined in the SIGN guidelines. The work also looked at the effects of adenoidectomy on outcome. Two- and three-way randomization was carried out in the two parallel studies; 155 cases with additional history of obstructive sleep apnoea or glue ear were randomized into two arms (adenotonsillectomy and control) and 177 subjects without these symptoms were randomized into three arms (tonsillectomy, adenotonsillectomy and control).

The results showed that the incidence of throat infection was significantly lower in the surgical groups than in the control groups during each of the three follow-up years and that adenotonsillectomy was no better than tonsillectomy alone. However, it was also reported that the incidence of 'moderate' or 'severe' episodes of tonsillitis in the control group was low and there was a 7.9% incidence of postoperative complications in the cases undergoing surgical intervention. From this, Paradise et al (2002) concluded that there are 'modest' benefits of surgery in children moderately affected with sore throats.

From the Netherlands, where rates of tonsillectomy are considerably higher than in UK or the USA, van Staaij et al (2004) reported an open multicentre, randomized controlled trial of children with mild symptoms, comparing surgical intervention (adenotonsillectomy) and watchful waiting. They randomized 300 patients between the ages of 2–8 years. They excluded cases that fulfilled the criteria of the original Paradise trials (i.e. severely affected children) in order to look at the milder end of the symptom severity spectrum. The outcome measures included the frequency of episodes of pyrexia, throat infections, upper respiratory tract infections and health-related quality of life. The study concluded that adenotonsillectomy had no significant clinical benefits over watchful waiting in children with mild upper respiratory symptoms (van Staaij et al, 2004). Further work from the Netherlands has shown that surgery in children with mild to moderate symptoms results in a significant increase in cost without any significant clinical benefit (Buskens et al, 2007).

It must be noted that with both the Paradise et al (2002) and van Staaij et al (2004) studies the inclusion criteria for intervention were considerably less stringent than those outlined by the SIGN guidelines (*Table 1*) and in the van Staaij et al (2004) study adenoidectomy was routinely combined with tonsillectomy and only younger children (under age of 8 years) were included.

One of the sequelae of acute tonsillitis is a peritonsillar abscess or quinsy (*Figure 2*). This is a collection of pus in the space between the capsule of the palatine tonsil and the pharyngeal muscles. It is the commonest deep infection of the head and neck (Khayr and Taepke, 2005). There is no clear consensus on the role of tonsillectomy in preventing recurrence of peritonsillar abscesses. It is reported that patients with a prior history of recurrent

Figure 2. Left-sided peritonsillar abscess (quinsy).

tonsillitis (two or three episodes per year) are more likely to develop recurrence and for such cases tonsillectomy should be considered (Khayr and Taepke, 2005). Good quality evidence comparing efficacy of tonsillectomy to conservative management in the prevention of further peritonsillar abscesses is lacking.

Anecdotal evidence would suggest significant benefit following tonsillectomy for infection, but there are no good quality randomized controlled trials to support this. In clinical practice the prevailing opinion is that in carefully chosen patients tonsillectomy is of great benefit. The results of the Scottish Tonsillectomy Audit found a high level of satisfaction (97% at 1 year of follow-up) among those undergoing surgery and in the case of children by their parents and carers (Blair et al, 1996). Similar high satisfaction rates and positive outcomes have been reported by other authors (Robb et al, 2009). There is evidence to suggest that the morbidity of chronic, untreated tonsillitis decreases with time; despite this, however, tonsillectomy results in significantly better outcomes in comparison to time alone (Fox et al, 2008). There is also evidence of improvement in disease-specific and global quality of life outcomes in both the adult and paediatric populations following tonsillectomy for recurrent or chronic tonsillitis (Goldstein et al, 2008; Witsell et al, 2008).

Sleep disordered breathing

Sleep disordered breathing is a spectrum of disorders ranging from simple snoring to obstructive sleep apnoea. In the paediatric population adenotonsillar hypertrophy (*Figure 3*) is the commonest cause of sleep disordered breathing (Sargi and Younis, 2007). Sleep disordered breathing can result in failure to thrive, problems with behaviour, poor cognition and school progress, and reduced quality of life (Mitchell and Kelly, 2007). Severe cases if left untreated can progress to cor pulmonale, right ventricular hypertrophy, congestive cardiac failure, pulmonary hypertension and pulmonary oedema, with a potential risk of neurological deficits and even fatality (Darrow and Siemens, 2002).

Figure 3. Tonsillar hypertrophy resulting in oropharyngeal airway compromise.

An increased awareness of the impact of untreated sleep disordered breathing has resulted in sleep disordered breathing being an increasingly prevalent indication for paediatric tonsillectomy (with or without adenoidectomy). Although there is a lack of randomized controlled trials, published literature strongly supports that (adeno) tonsillectomy is associated with significant improvements in both subjective (behaviour, quality of life, cognitive function) and objective (polysomnography) outcome measures in children with sleep disordered breathing (Mitchell and Kelly, 2007; Garetz, 2008).

Baldassari et al (2008) showed that children at the obstructive sleep apnoea end of the sleep disordered breathing spectrum have quality of life outcome measures similar to those of children with juvenile rheumatoid arthritis and that there is a large improvement in their quality of life indices after adenotonsillectomy. They also reported that this improvement is maintained on a long-term basis (Baldassari et al, 2008). This has led to a changing trend with an increasing number of paediatric tonsillectomies being performed for sleep disordered breathing rather than recurrent infections (Garetz, 2008).

Tonsillar asymmetry

Other rare indications for tonsillectomy include suspicion of malignancy (tonsillar asymmetry) and recurrent haemorrhagic tonsillitis. In cases with tonsillar asymmetry, without additional suggestive symptoms, the incidence of malignancy is reported as being low; in children apparent tonsillar asymmetry is often secondary to asymmetrical effacement of tonsils by the tonsillar pillars (Syms et al, 2000).

Current UK practice

The majority of tonsillectomies in the UK are performed for recurrent or chronic tonsillitis and sleep disordered breathing. The decision about tonsillectomy is tailored to the clinical needs of the individual patient in consultation with the otolaryngologist, taking into consideration available evidence and clinical guidelines. As with any surgical procedure, the risks of surgery and associated morbidity must be balanced against the potential benefit. BJHM

Conflict of interest: none.

KEY POINTS

- Tonsillectomy is one of the most commonly performed surgical procedures in the UK.
- Recurrent tonsillitis and sleep disordered breathing are the main indications for tonsillectomy.
- The decision regarding tonsillectomy is tailored to the clinical needs of the individual patient.

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