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Personal Practice

Tonsillectomy and Adenoidectomy: Otolaryngologist's Perspective

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Abstract Children with tonsils and adenoid problems are often managed by both the paediatrician and otolaryngologist. Otolaryngologists are involved when surgical treatment is necessary. This paper discuss the issues that otolaryngologist usually encounter, including selection of patient for surgery, pre-operative councilling, and surgical complication. New surgical tools are available. Yet dissection with cold steel e.g. scissors and curette, is still the technique to beat. There is a recent interest in tonsil volume reduction by subcapsular removal of tissue, thereby reducing both the obstruction and postoperative morbidity. Long term follow up is necessary to define it's role in management of patients with obstructive sleep apnoea.

Key words Adenoidectomy; Obstructive sleep apnoea; Tonsillectomy

Introduction

Tonsillectomy and adenoidectomy (T&A), amongst surgeries like circumcision and myringotomy, are two of the most performed paediatric surgical procedures. Children with tonsillar and adenoid diseases are almost invariably looked after by a combination of family physician, paediatrician and otolaryngologist, and often in this sequence. The difference in clinical training for the three parties concerned sometimes results in adoption of a different approach to this very common paediatric problem. The objective of this article is experience sharing and to discuss issues encountered by otolaryngologist in everyday management of patients who may require T&A.

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Indications for Surgery

The two commonest indications for T&A are recurrent tonsillitis and tonsil/adenoid hypertrophy resulting in obstructive sleep apnoea (OSA). The two indications in fact often co-exist in patients who eventually need the surgery. Over the years, a shift of indications from recurrent tonsillitis to organ hypertrophy/OSA as the reason for T&A has been observed.

One must understand that T&A in most circumstances are performed with an objective to improve the quality of life of a patient, be it control of a troublesome infection, or relieve of airway obstruction, or both.[1] As such, recommendation for the surgery should be made only after detailed deliberation to all circumstances relevant to the patients and their families. Take recurrent tonsillitis as an example, the classical textbook indication of seven attacks in one year, or five attacks per year for two consecutive years, or three attacks per year for three consecutive years, are perhaps too simplistic an approach to the problem.[2] If this is to be upheld, the recommendation for surgery can be made by a computer instead of a clinician. Other

considerations like the severity of each attack, responsiveness to medication, associated morbidity such as febrile convulsion or tonsillar bleeding, and the parents' ability to cope with their child's recurrent infection etc, are all relevant.

The second indication for T&A is obstructive sleep apnoea, which results from tonsil and adenoid hypertrophy in most paediatric patients.[3] Theoretically, OSA can be treated by either the use of continuous positive airway pressure (CPAP) or surgical removal of the tonsils and the adenoid.[4] In view of the potentially curative nature of T&A, CPAP is often considered a second-line treatment in children.

The diagnosis of OSA depends on a combination of clinical assessment and polysomnography (PSG).[5] In the issue of making a diagnosis, there is the debate on whether one should rely more on symptoms or the PSG result. Clinical assessment depends on diligent and observant parents who sleep with the child. In Hong Kong, the Chinese culture and limitation in household area often put the parents and child together in the same room through the night, thus making parental observation a reliable source of clinical information. Nocturnal features of OSA include habitual snoring, witnessed apnoea, profuse sweating during sleep, enuresis, bruxism, interrupted sleep, tendency to sleep in a prone position and with neck extended. Nowadays, sleep documented by home video recording is often presented to doctor at the first clinic consultation. This has greatly enhanced the ability of doctors in assessing the severity of the OSA. Yet some of the clinical features of OSA like enuresis and sweating are non-specific.

PSG measures multiple physiological parameters during sleep, notably oxygen saturation and apnoeic episodes. PSG is considered the gold standard in diagnosing paediatric OSA, yet the data must be interpreted with care. The size of the tonsils in children may vary significantly on a short term basis (days or weeks) as a result of presence or resolution of an infection. As a result, the severity of OSA also tends to vary on a short term basis according to the size of the tonsils and adenoid. This is in contrast to adult where the severity of OSA is more stable and varies on a long term basis (months or years). The timing of the PSG is therefore important for children. In addition, interpretation of paediatric PSG data required the expertise of an experienced and trained paediatrician respirologist. The equipment is the same, yet adult's normal value cannot be applied to children.

Should one heed clinical observation or the PSG result? There is no simple answer. On the one hand there is the "parent driven" diagnosis where parents well informed of the clinical features of OSA (often from media or the web), come with description of classical symptoms in their child, and themselves exhausted from looking after the child night after night. They could ask for surgery and decline the intermediate step of a PSG as unnecessary. The benefit of surgery in such cases is often dramatic. On the other extreme, there is the "PSG driven" diagnosis where PSG data has the last word in management decision making, regardless of the severity of clinical symptoms. PSG is reliable if the test is properly conducted and the child sleeps natural and well. This may not be generally true. The presence of multiple electrodes on the surface of the body during the test challenge the delivery of a natural sleep. Thus false negative results may occur.

Other indications for tonsillectomy included Streptococcal infection, asymmetry with the suspicion of malignancy, and tonsil bleeding which occurs rarely during tonsillitis, usually as a result of a prominent vessel located on the surface which rupture during an infection. Tonsillectomy is also performed as part of the procedure of submandibular duct relocation for control of drooling. Although tonsillitis occurs mainly in children, quinsy, or peritonsillar abscess, rarely occur at this age.

Pre-operative Councilling

When a decision for T&A is made, 5 issues are invariably discussed: 1) the impact on immunity; 2) will natural regression of the tonsils and adenoid occur if one waits and observe? 3) will the tonsils or the adenoid re-grow after the surgery? 4) risks of the operation; and 5) risks of general anaestuesia (GA).

T&A has not been shown to reduce the immunity of children.[6] The frequency of upper respiratory tract infection has not been shown to increase in those who underwent the surgery.

Is watchful awaiting worth following? The fact that tonsils are biggest between the ages of 4 to 6 is not applicable to all children and may need to be re-examined at the present day and age. As we are aware, some tonsils remain obstructively big after the age of 6 and shows no sign of regression. In addition, the authors are seeing more and more patients with large adenoid from an early age of several months, so much so that OSA is already clinically

present. More research is probably necessary to elucidate the current biological behaviour of the tonsils and adenoid.

Re-growth of tonsils after total tonsillectomy is uncommon. A well defined tissue plane is present between the tonsil and the underlying pharyngeal constrictor muscle especially in children. Careful dissection along this plane by an experienced surgeon will remove all tonsil tissue. However, there is a recent interest in the role of subcapsular tonsillectomy, removing part but not all tonsil tissue.[7] This interest is generated at least partly due to the advent of modern day surgical tools like radiofrequency or powered instrument, making subcapsular removal of tonsil tissue possible. Yet long term follow up is necessary to look into the extent of tonsil re-growth after such a procedure, with resulting recurrence of obstruction. Currently such data is not available.

The nasopharynx where the adenoid is located is more difficult to approach surgically, and the tissue plane between the adenoid and underlying prevertebral muscle is ill defined. Some adenoid tissue could be left after adenoidectomy, and this explains why re-grow tends to occur. Yet re-grow to former size is uncommon after a properly performed adenoidectomy.

Amongst all the complications of T&A that could occur, the one that is of concern is post-operative bleeding. The risk of bleeding depends on the experience of the surgeon. The generally quoted risk is 2 percent, half of which is primary or reactionary bleeding occurring within the first 24 hours and the other half is secondary bleeding, secondary to infection occurring around 5 to 7 days after the surgery.[8] Should primary bleeding occur, hemostasis under GA should be performed.

The risk of anesthesia is small. Paediatric anesthetist is as important as the surgeon in the overall peri-operative care of the patient. The use of narcotic analgesic for post-operative pain control is contraindicated as it may suppress respiratory drive. Every effort should be made to reduce the anxiety and physical discomfort that could result from this procedure.

The Surgery

There are two areas of interest in the surgery of T&A in recent years. Firstly the use of modern day technologies such as coblation, harmonic scalpel, radiofrequency, and powered instrument or laser, verses the conventional technique of using cold steel e.g. scissors and adenoid curette, in performing tonsillectomy and adenoidectomy.[9] Secondly, the role of lesser surgery, for example unilateral tonsillectomy, or subcapsular tonsillectomy for patients with OSA.[8]

For total bilateral tonsillectomy, a large scale study in the UK has shown that T&A performed with "cold dissection" technique using scissors results in less post-operative pain and haemorrhage compared to surgery performed with monopolar diathermy.[10] The use of diathermy shortens the surgery time, yet the heat generated results in more collateral tissue necrosis and therefore an increase in post-operative morbidity.[11] Coblation and harmonic scalpel have the advantage of achieving better haemostasis without the use of diathermy.[12,13] However, the cost of the new instruments is high and the instruments are available only in some hospitals. It seems that the age old method of cold dissection with scissors has stood the test of time and still compares favorably with newer techniques in terms of cost and incidence of post-operative complication.

There are recent proponents for tonsil volume reduction with techniques like subcapsular tonsillectomy and unilateral tonsillectomy. In subcapsular tonsillectomy, lymphoid tissue under the surface lining of the tonsils is removed with various techniques such as radiofrequency, coblation or microdebrider. The surface lining is preserved with the aim of reducing pain and containing bleeding. Early results showed a reduction in post-operative pain and bleeding compared to electrocautery or coblation tonsillectomy.[8] There was however no study comparing subcapsular tonsillectomy and tonsillectomy with cold dissection technique. In addition, long term results are not available, and the issue of tonsil re-grow after this procedure has to be investigated by long term follow up as most tonsillectomies are performed for OSA.

Conclusion

T&A is an important part of paediatric OSA management. The challenge, for all parties concerned, is in making the recommendation for surgery for the appropriate patient. Thorough preoperative discussion with the parents regarding the risk of the operation is necessary. New surgical tools are available as well as an interest in the role of lesser surgery. Long term results are necessary to define their role in T&A.

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