

Laser Tonsillectomy in Children with Tonsillar Hyperplasia

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Summary

Tonsillectomy in children is performed on a regular basis in ENT. The indications are chronic tonsillitis, sleep apnea and access to deeper structures. The natural history of tonsillar hyperplasia is regression when a child is six years old and beyond. In children with bilateral tonsillar hyperplasia we studied the use of laser as an alternative procedure to reduce the bulk of the tonsillar mass. Children with symptoms of bilateral tonsillar hyperplasia underwent laser tonsillectomy. The tonsils were dissected using carbon dioxide (CO₂) laser. The tonsillar bed was left untouched. Intraoperative and postoperative conditions were noted.

Key Words: Laser Tonsillectomy, Tonsillar Hyperplasia, Children

Introduction

Tonsillectomy is one of the most frequent surgical procedures carried out in children. The aim is to reduce obstruction from enlarged tonsils or to counter frequent tonsillar infections. During recovery, children may have considerable pain and eat poorly for several days. Such early unpleasant contacts with medical care may induce behavioural changes in children. Subsequent negative reactions to hospitals and health care are frequently seen.

A complete removal of tonsils always involves the danger of postoperative hemorrhage despite the various technical means employed (guillotine, cold dissection, electrocautery, microbipolar and harmonic scalpel)¹. Furthermore the problem of postoperative pain remains unresolved.

Case Reports

Case 1

Two years old Malay boy from Pasir Mas was referred to ENT for persistent snoring for one year. He has no

other symptoms of recurrent tonsillitis. On examination, both of the tonsils were enlarged. Other systemic examination was unremarkable. After a discussion with the parents, consent was obtained for laser tonsillectomy. The histopathological examination showed reactive lymphoid hyperplasia.

Case 2

Three years old Malay girl from Jerreh, Trengganu who has persistent snoring for two years was seen at the ENT clinic. There were no other symptoms of recurrent tonsillitis. On examination, both of the tonsils were noted to be enlarged. The parents were explained about the problem and gave consent for laser tonsillectomy to be done. The histopathological examination showed reactive lymphoid hyperplasia.

Case 3

Four years old Malay boy from Kota Bharu was seen at the ENT clinic with problem of snoring for six months. Mother noted he woke up at night breathless. He also was seen to be yawning a lot in the morning. He didn't complain of any symptoms of recurrent tonsillitis. On

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examination he was obese and the tonsils were enlarged and almost touching each other. After a discussion with the mother, consent was given for laser tonsillotomy. The histopathological examination showed reactive lymphoid hyperplasia.

Procedure

The tonsillotomy was performed under general anaesthesia and carbon dioxide (CO₂) laser Sharplan Luments 30°C was used.

Anesthetist familiar with the laser surgery technique provided the anaesthesia. All patients were intubated using a laser-shield endotracheal cuffed tube (Medtronic Xomed) with internal diameter size ranging from 4 – 5 mm (endotracheal cuffed tube size calculation Age/4 + 4). This is a special tube designed for laser surgery and was prefilled with methylene blue by the manufacturer. Total intravenous anaesthesia (TIVA) with propofol was used to maintain anaesthesia so that volatile agents could be avoided. One minute prior to the use of laser, oxygen was turned off and all patients were given only air with closed monitoring of the SpO₂ to be maintained more than 90%.

The CO₂ laser was commenced using a hand-piece in a non-contact mode. The power setting of the laser was at 15 watt continuous wave mode. The tonsils were dissected from the anterior to posterior palatoglossal fold. For better resection we infiltrated the peritonsillar tissue with saline solution. The surrounding mucosa was protected by wet gauze. With the CO₂ laser, the tonsils were vapourised along the line of anterior and posterior palatoglossal fold.

Results

Parents were asked on the amount of pain, ability to eat and request for analgesic (Table I). Patients were examined intraorally for the degree of mouth opening, bleeding or slough from the tonsillar remnant. They were followed up in the clinic after one week, one month, six month and one year post surgery.

As the aimed of this procedure was to partially remove the tonsils, there was tonsillar remnants which healed completely after one week. No evidence of infection of the tonsillar remnants seen on subsequent follow-up at one month, six month and one year post-surgery. Intraoperatively, the bleeding was minimal and negligible. Post-operative pain appeared slight and easily controlled. There was no dissection on the tonsillar bed as in the conventional tonsillectomy and thus less bleeding and only minimal pain. On subsequent follow-up the patients did not develop any problem.

Discussion

Tonsillar hyperplasia usually occurs in early childhood or in infancy reaching highest incidence in the age group of 3-5 years¹. This is due to an increased in immunologic activity. This involves an increase in the number of lymphoid follicle, a lengthening of the supporting connective tissue but no widening or scarring.

The main concern in all paediatric patients is blood loss due to their small blood volume. The rationale behind tonsillotomy or partial removal of tonsillar tissue is to reduce the volume of the tonsil and thus remove the obstruction along the airway and the alimentary channel. Cutting straight through tonsillar tissue with a laser beam will coagulate small vessels along the way and no large vascular stalks are divided. Postoperative major bleeding is therefore unlikely. We chose CO₂ laser as it allows accurate focus. In addition the short pulses allow excision of diseased tissue and reduce unwanted damage.

Laser tonsillotomy is a partial removal of tonsils using carbon dioxide laser. The cases chosen should be strictly for tonsillar hyperplasia and not for chronic infection as in chronic tonsillitis. As the cases we selected were not due to chronic tonsillitis there is only minimal risk of infection to the tonsillar remnants.

Table I: Post-operative Assessment

Assessment	Pain	Ability to eat	Request for analgesic
Patient -			
1	Slight	Yes	No
2	None	Yes	No
3	Slight	Yes	No

This technique performed in a larger group of patients also showed less cases of intraoperative and postoperative hemorrhage^{2,3}. The presence of small vessels in the tonsils compared to the peritonsillar region result in minimal blood loss. Postoperative pain is reduced as the tonsils are only sensitive around the mucosa whereas trauma to the pharyngeal musculature in tonsillectomy is extremely painful. Furthermore, in standard tonsillectomy, the blood vessels are diathermized and the muscle exposed and then the tonsil shelled out from its bed of muscle, which ulcerates and causes two to three weeks of pain.

In a randomized study by E. Hultcrantz and colleagues⁴, tonsillotomy with CO₂ laser was performed comparing it to regular tonsillectomy with special attention to postoperative pain and symptom recurrence. Their aim was to cure children with snoring and sleep apnea from their obstructive problems without influencing the immunological function of the tonsils. The study included 41 children between the ages of 3.5 and eight years of age (21 tonsillotomies and 20 tonsillectomies). They were all operated under general anesthesia and

followed the same postoperative scheme for analgesia. A visual analogue scale for pain measurements with faces was used for the first 24 hours. After that, each day until pain free, the parents registered the child's pain on a three graded scale, what the child was able to eat, and the amount of analgesic drugs used. All the children were cured from their breathing obstruction. The mean time used for the surgery was the same, and no postoperative bleeding was seen in either group. Tonsillotomy children were pain free after five days, and tonsillectomy children were pain free after eight days. Eight to ten days after surgery, the tonsillotomy-children had gained weight, and the tonsillectomy children lost weight significantly. The tonsillectomy group used twice as much analgesic drugs as the tonsillotomy group during the first postoperative week. The tonsillotomy group was healed with normal-looking, but small tonsils after 8-10 days; the tonsillectomy group often still showed edema and crusts. At the one-year follow-up, 2 out of 21 among the tonsillotomy-children snored but did not require revision surgery.

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