

Original Article

CO₂ laser tonsillectomy: A comparison with conventional technique

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ABSTRACT

Objective: To define the advantage and disadvantage of Co₂ laser tonsillectomy compared with conventional method.

Material and Method: One hundred patients age 5-15 underwent tonsillectomy. One tonsil was removed with the Co₂ laser and the other was excised with conventional dissection and snare technique. Patients were not told which tonsil was removed with laser. Intraoperative blood loss, operation time, pain and healing were compared for two methods.

Results: In Co₂ laser tonsillectomy, there was a significantly reduction in operation time (5vs11.3 minutes $P<0.05$) and a significant reduction in intraoperative blood loss (5vs15ml $P<0.005$). There was no significant difference in immediate and late post tonsillectomy hemorrhage, post operative pain, character of leukocytic membrane separation, epithelialization and final cicatrization between two groups .

Conclusion: Co₂ laser tonsillectomy reduces operation time and intraoperative blood loss. (Rawal Med J 2007;32:187-189).

Key Words: Co₂ laser, tonsillectomy, cold dissection.

INTRODUCTION

Many surgical techniques have been described for extirpation of tonsils. Sharp instrumentation and Guillotine tonsillectomy techniques are still used.¹ More recently, however, dissection using various electrautery devices have become popular. First clinical experience with laser was reported in 1972, but it is only recently that the use of laser has been widespread.² Tonsillar hyperplasia leading to dyspnea and other symptoms of obstruction represents a common problem especially in young children where tonsillectomy should be avoided in order to preserve the immunological

function of the tonsils.³ It was suggested that the effect of the laser for tonsillectomy is associated with reduction of immediate post operative pain, and less intra operative blood loss.⁴⁻⁶ The purpose of this study was to further define the advantages and disadvantages of Co₂ laser tonsillectomy compared with the conventional method.

MATERIAL AND METHODS

This study was carried out with informed consent of the patients' parents. The study began in February 2002 and concluded in September 2004. One hundred patients (50 male and 50 female) ranging in age from 5 to 15 years underwent tonsillectomy. In each patient, one tonsil was removed with Co₂ laser and the other was excised with conventional dissection and snare technique. The method allowed each patient to serve as his own control.

The parameters monitored were intraoperative blood loss, operation time, post operative pain and healing. Patients were not told which tonsil had been removed with the laser. Blood loss was estimated by calculation the number of soaked tonsillar gauzes and measuring volume of suctioned blood. Patients were asked on the first 24 hours after surgery which side of their throat was most painful, and their responses were recorded to the same question asked 5 to 7 days later at the office visit. Healing was assessed at the office visit by noting the degree of erythema and character of leukocytic membrane formation and final cicatrization. The data were subjected to sign-test analysis of statistical significance.

RESULTS

Intra operative blood loss was dramatically less with the use of Co₂ laser than conventional method (5 vs 15ml $P < 0.05$). Vigorous bleeding did not prolong this time especially on the laser surgery site. There was statistically significant difference in duration of operating time (5 vs 11.3 min).

The incidence of immediate and late postoperative hemorrhage were not statistically significant different between two techniques ($P > 0.05$). Both methods of surgery had identical effect on post operative pain (CI 95%). All of patients had post operative pain with 88 patients having equal bilateral pain. Seven patients had more pain at the laser surgery site and 5 patients had more pain at the conventional surgery site. Both method of surgery seemed to have identical effect on leukocytic membrane formation and separation and final cicatrization.

DISCUSSION

Serious post operative complications secondary to surgery of the tonsils and adenoid are primarily related to pain, hemorrhage, air way obstruction, postoperative pulmonary edema, nasopharyngeal stenosis, and death. Meticulous attention to surgical technique and technical advances in modern anesthesiology has significantly reduced the number of complications related to adenotonsillectomy. In recent years, the advent of new technologies has allowed various innovative techniques to perform tonsillectomy. Although these techniques are relatively new but long-term data regarding their use are not yet available.

Co₂ laser produces light with a wave length of 10.6 μm in infrared (invisible) range of the electro magnetic spectrum. The radiant energy produced by the Co₂ laser is strongly absorbed by pure, homogenous water and by biologic tissues high in water content. Because absorption of radiant energy produced by the Co₂ laser is independent of tissue color and because the thermal effect produced by this wave length on adjacent non target tissue are minimal, the Co₂ laser has become extremely versatile in otolaryngology.¹ Many studies of Co₂ laser use in the oral cavity and oropharynx have shown benefits of laser excision over conventional technique.^{1,4}

The best advantage of Co₂ laser tonsillectomy is that operating time and blood loss was less than cold dissection. It was reported that the post operative hemorrhage rate after conventional tonsillectomy was between 2-5%.⁵ Post tonsillectomy hemorrhage can be intraoperative, immediate (first 24 hour after operation) and late hemorrhage.¹ Tonsillectomy by laser microsurgery has shown that it improves the precision of tonsillectomy and provides a maximum protection for peritonsillar tissue and the incidence of severe bleeding events declines.^{4,5} Co₂ laser not only used for tonsillectomy but also is a valid treatment for obstructive symptoms caused by enlarged tonsil.⁶⁻⁸ Also Co₂ laser cryptolysis has been used for treatment of chronic tonsillitis and halitosis, procedure being a conservative, safe and well tolerated technique requiring short operative time without any risk from general anesthesia.⁹⁻¹¹ In conclusion, laser tonsillectomy had lower intraoperative blood loss and shorter operation time. Although Co₂ laser has a better coagulation property but there was no statistically significant effect on immediate and late post operative hemorrhage with its use.

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