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ORIGINAL RESEARCH

To assess the impact of coblation in minimising adenoidectomy discomfort and morbidity

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ABSTRACT

Aim: *The study's goal is to assess the impact of coblation on minimising adenoidectomy discomfort and morbidity.*

Material and methods: *The ENT department performed this retrospective observational analysis. The study included 100 young people who underwent coblation adenoidectomy. A 0° endoscope was passed after nasal decongestion with 4% xylocaine and adrenaline solution. The adenoids and nasal cavity were examined. A Boyle Davis mouth gag was employed, as well as Coblation technology with ProciseTM XP or ProciseTM MAX tips, to remove adenoid tissue and achieve hemostasis at the same time.*

Results: *Patients' pre-operative symptoms of disrupted sleep are compared to their post-operative sleep. All 100 patients had disrupted sleep before surgery; however, only 13 experienced disturbed sleep in the early post-operative period, while the other 87 had pleasant sleep. Post-operative discomfort following coblation adenoidectomy was assessed both immediately after surgery and one week later. 75% of patients reported no pain in the immediate post-operative period, and 91% reported no discomfort when they returned to the hospital for the first time one week following surgery. In our study, we counted the number of upper respiratory infections that occurred after coblation adenoidectomy. Within the first year, 71 (71%) of patients had no episodes of nasopharyngeal infection. Within the first year, 29 individuals (29%) developed infections.*

Conclusion: *We conclude that the endoscopic assisted coblation adenoidectomy is a safe and effective method of adenoidectomy.*

Keywords: *Adenoidectomy, Coblation, Obstructive sleep apnoea, Paediatric sleep apnoea*

INTRODUCTION

The adenoids are a mass of lymphoid tissues found in the superoposterior portion of the nasopharynx that impact upper airway respiration. It is known that, in general, the adenoids are small at birth and continually increase for many years following birth due to the immune system's hyperactivity. Adenoid hypertrophy may cause nasal blockage, mouth breathing, snoring, and speech problems, among other symptoms. It has also been linked to otitis media,

dentofacial abnormalities, and obstructive sleep apnea syndrome. [1] As a result, if enlarged adenoids cause a variety of problems, surgical removal of the adenoids is usually required, and adenoidectomy is one of the most commonly performed surgical procedures in paediatric otorhinolaryngology.[2] Adenoidectomy has been performed using a variety of surgical procedures. Adenoidectomy using a curette, monopolar suction diathermy adenoidectomy, power-assisted (or microdebrider) adenoidectomy (PAA), coblation adenoidectomy (CA), laser adenoidectomy, and other procedures are among them. [3-5] The coblation approach offers the benefit of using the same surgical wand for ablation, coagulation, saline irrigation, and suction. It entails delivering a radiofrequency bipolar electrical current over a medium of normal saline, producing a plasma field of highly ionised particles, that then break down intercellular connections and melt tissue at roughly 70 degrees Celsius (c.f. electrocautery, which cuts tissues at 400C or greater). Coblation tonsillectomy may be performed in two ways: (1) subtotal, intracapsular tonsillectomy, in which some tonsil tissue is retained; and (2) Total, subcapsular tonsillectomy, in which the whole tonsil is removed by dissecting between the tonsillar capsule and the surrounding pharyngeal muscle.[6]

Because of the vast number of adenoidectomies done and the many surgical procedures available, the highest importance should be given to safety, accuracy, and results when selecting between various surgical techniques, even if it is institution or centre specific. Controlled ablation, also known as Coblation, is capable of generating soft tissue breakdown by low temperature molecular disintegration. This results in volumetric tissue removal with minimum injury to neighbouring tissue, i.e. reduced collateral damage. [7] This method is often used in otorhinolaryngology surgeries like tonsillectomy and adenoidectomy. In this article, we share our experience with adenoidectomy utilising Coblation, including its benefits, drawbacks, and important results.

METHODS AND MATERIALS

After receiving clearance from the protocol review committee and the institutional ethics committee, this retrospective observational research was carried out at the Department of ENT. The research comprised 100 children under the age of 16 who had coblation adenoidectomy. Patients who had a denotonsillectomy as part of a combination operation were excluded from the research. All patients had a comprehensive history taken and a full ear, nose, and throat examination. To confirm the diagnosis, an X-ray nasopharynx lateral view soft tissue exposure or diagnostic nasal endoscopy was performed.

After nasal decongestion with 4% xylocaine and adrenaline solution, a 0° endoscope was passed. The adenoids and nasal cavity were examined. A Boyle Davis mouth gag was employed, as well as Coblation® technology, with ProciseTM XP or ProciseTM MAX tips (Smith & Nephew Inc Cordova, TN, USA) used to remove adenoid tissue and achieve haemostasis at the same time. Patients were examined immediately after surgery, during a one-week follow-up period, and their parents were questioned by phone three months and one year afterwards. The sleep disruption and physical suffering categories of the OSA-18 questionnaire created by Franco et al were used to analyse the sleep and recurrent upper respiratory infections. [7]

RESULTS

In our study, coblation adenoidectomy was performed in 100 patients which included 67 boys and 33 girls. The mean age was 8.3 years and the age range was age range 2-16years. (Table 1)

Table 1. Gender distribution of patients

Gender	Number of patients= 100	%
Female	33	33
Male	67	67

Pre-operative symptom of disturbed sleep in patients is compared with post-operative sleep. Pre-operatively all 100 patients had disturbed sleep whereas in immediate post-operative period only 13 patients have disturbed sleep and all other 87 patients have comfortable sleep. (Table 2)

Table 2. Comparison of sleep of patients in pre-op and post-op periods

	Pre-operative	%	Post-operative	%
Disturbed sleep	100	100	13	13
Comfortable sleep	0	0	87	87

Post-operative pain after coblation adenoidectomy was evaluated during immediate post-operative period and one week post-operatively. 75% patients did not have pain in immediate post-operative period and 91% had no pain when they visited hospital for first review, that is, one week after surgery. (Table 3)

Table 3. Pain during immediate post-op and one week post-op

	Immediate post-operative	%	After one week post-operative	%
Pain present	25	25	9	9
No pain	75	75	91	91

In our study, number of upper respiratory infections after the coblation adenoidectomy was evaluated. 71(71%) patients had no episode of nasopharyngeal infection within the first one year. 29(29%) patients had infections within the first one-year. (Table 4)

Table 4. Upper respiratory infections within one year

Upper respiratory Infection	Number of patients	%
Present	29	29
Absent	71	71

In our study, length of hospital stay was evaluated on the basis of hospital stay less than one day and hospital stay more than one day. 71(71%) patients had less than one day of hospital stay and 29(29%) patients had more than one day of hospital stay.

DISCUSSION

Adenoidectomy is one of the most frequent operations done by otorhinolaryngologists across the globe.[8] Adenoid hypertrophy is defined as the abnormal proliferation of adenoid tissue in the nasopharynx. The adenoid pad may stay hypertrophied for a long period, even in maturity, as a result of recurrent bouts of infection. As a consequence, nasal obstruction, snoring, mouth breathing, aural fullness, and otitis media with effusion (OME) may ensue. Adenoid hypertrophy, which causes difficulty to breathe via the nose, resulting in persistent mouth breathing and may lead to dental and facial development problems. Surgery is often used to treat adenoid enlargement. The ideal method would be to alleviate the blockage while leaving little or no tissue in the nasopharynx and achieve a satisfactory postoperative outcome. The surgical methods for adenoidectomy have developed throughout time. Although it is an ancient procedure, "blind curettage" is still regarded the most simple, routinely done, and readily accessible adenoidectomy technique in many countries. [9] The curettage procedure involves the removal of adenoid tissue from the posterior margin of the vomer inferiorly to the level of the superior constrictor muscle. [10] The cervical vertebrae are located behind this layer and below the prevertebral fascia, and their shape is rounded, which contrasts with the instrument's completely straight edge. This results in lingering lateral lymphoid tissue in the nasopharynx, particularly at the eustachian tube level. [10] Endoscopic viewing of the tissue to be removed is a sensible and optimum surgical concept with the advancement of endoscopic sinus surgery. The development of powered instruments, such as

microdebriders, has provided several benefits for adenoidectomy, allowing for more accurate and efficient removal of adenoid tissue. [11] Although this method is extensively used, it has drawbacks such as very restricted instrument manoeuvrability in the nasopharynx and difficulties entering the inferior nasopharynx. The coblation technique employs bipolar radiofrequency radiation for tissue breakdown at relatively low temperatures (between 40 and 70 degrees Celsius) while simultaneously coagulating, resulting in little intraoperative bleeding and quick postoperative recovery. According to Chinawa et al, the most frequent symptoms shown by practically all adenoid hyperplasia patients include cough, catarrh, snoring, and mouth breathing, particularly at night. [12] In their study, Ferreira et al reported that the pre- and postoperative evaluation of OSA-18 scores showed a statistically significant improvement, with the mean preoperative OSA-18 score (SD) of patients who underwent coblation adenoidectomy being 77.25±6.07 and the postoperative period score of patients who underwent coblation adenoidectomy being 32.25±8.42. [13] Post-operative discomfort following coblation adenoidectomy was assessed both immediately after surgery and one week afterwards. 75% of patients reported no pain in the immediate post-operative period, and 91% reported no discomfort when they returned to the hospital for the first time one week following surgery. Businco et al compared cold curettage with coblation adenoidectomy and found that patients with cold curettage had a pain score (SD) of 7.15±1.46 and 3.85±1.53 on the same day of operation, respectively, which was statistically significant. [14] The primary cause for a longer hospital stay is post-operative discomfort. Because the initial postoperative discomfort was minor in coblation adenoidectomy, the length of hospital stay was also significantly shortened, boosting the procedure's acceptability. The length of hospital stay was assessed based on whether it was less than one day or more than one day. 71% of patients stayed in the hospital for less than one day, whereas 29% stayed for more than one day. In our research, 71% of patients had no incident of upper respiratory tract infection (URTI) during the first year following surgery, whereas 29% had one or more episodes. Reducing post-operative URTI episodes has a major influence on the patient's academic and social performance. According to Bradoo et al, the quantity of adenoid tissue left behind after endoscopic aided adenoidectomy and traditional curettage varies substantially.[10] Following curettage adenoidectomy, a considerable proportion of patients (43.7%) had moderate residual disease, which might lead to recurrence of symptoms. Although this may not have clinical consequences in the early post-operative period, there is a distinct risk of residual adenoid tissue regrowth, resulting in a resurgence of ear and nose symptoms, which may lead to subsequent bouts of upper respiratory infections. Furthermore, owing to restrictions in manoeuvring the microdebrider in the nasopharynx and greater bleeding from cutting, leftover adenoid tissue in the peritubal region may be left beyond because to the operating surgeon's fear of damaging the tubal orifice and subsequent scarring. [10]

In this study, we compared the pre-operative symptom of disrupted sleep in adenoid hyperplasia patients to the postoperative sleep. Pre-operatively, all patients had disrupted sleep, however post-operatively, only 13(13%) had disturbed sleep and the remaining 87(87%) had pleasant sleep.

CONCLUSION

Endoscopic assisted coblation adenoidectomy is a safe and successful adenoidectomy technique. Endoscopic visualisation aids in performing a thorough adenoidectomy, and the coblation approach aids in a less uncomfortable post-operative experience for patients and their families, with fewer issues in the future. Despite all of the benefits, the high learning curve and scarcity of affordable coblation tools are preventing coblation adenoidectomy from becoming more widespread.

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