Original Research Article

A retrospective observational study to assess the role of coblation in reducing pain and morbidity of adenoidectomy

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Abstract

Aim: The aim of the study to evaluate the role of coblation in reducing pain and morbidity of adenoidectomy. **Material and methods:** This retrospective observational study was conducted in the department of ENT Nalanda Medical College and Hospital, Patna, Bihar, India for one year. Total 50 children who underwent coblation adenoidectomy were included in the study. A 0° endoscope was passed after nasal decongestion with 4% xylocaine and adrenaline solution. The nasal cavity and adenoids were inspected. A Boyle Davis mouth gag was applied and the Coblation technology was utilized, with Procise™ XP or Procise™ MAX tips being used to remove adenoid tissue and to achieve haemostasis simultaneously. **Results:** out of 50 patients 34 male and 16 female. Pre-operatively all 50 patients had disturbed sleep whereas in immediate post-operative period only 7 patients have disturbed sleep.76% patients did not have pain in immediate post-operative period and 90% had no pain when they visited hospital for first review, that is, one week after surgery. 36 (72%) patients had no episode of nasopharyngeal infection within the first one year. In our study 35(70%) patients had less than one day of hospital stay and 15(30%) patients had more than one day of hospital stay. **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 located in the superoposterior area of the nasopharynx and affect breathing in the upper airway. It is known that, in general, the adenoids are tiny in size at birth and consistently grow during several years after birth due to the hyperactivity of the immune system. Adenoid hypertrophy can lead to various symptoms such as nasal obstruction, mouth breathing, snoring, and speech abnormalities. It has also been known to be a risk factor for otitis media, dentofacial abnormality and obstructive sleep apnea syndrome.[1] Therefore, if the enlarged adenoids cause a variety of problems, surgical removal of the adenoids are generally required and adenoidectomy is one of the most commonly performed surgical treatment in the field of pediatric otorhinolaryngology.[2] There have been several operative techniques used for adenoidectomy. They include conventional curette adenoidectomy, monopolar suction diathermy adenoidectomy, power-assisted (or microdebrider) adenoidectomy (PAA), coblation adenoidectomy (CA), laser adenoidectomy and so forth.[3-5]

The coblation technique has advantages in that the surgical wand can work for ablation, coagulation, saline irrigation and suction at the same time.[5]

its involves passing a radiofrequency bipolar electrical current through a medium of normal saline, resulting in a plasma field of highly ionized particles, which in turn break down intercellular bonds and thus melt tissue at around 70C (c.f. electrocautery which cuts tissues at 400C or greater). There are two different techniques for coblation tonsillectomy: (1) Subtotal, intracapsular ablation in which some tonsil tissue may be left behind; and (2) Total, subcapsular dissection of tonsils, in which the entire tonsil is removed by dissecting between the tonsillar capsule and the surrounding pharyngeal muscle.[6]

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Due to the large number of adenoidectomies performed and the multiple surgical techniques available, utmost priority should be given to the safety, accuracy and outcomes when choosing among different surgical techniques, even though it could be institution or centre specific. Controlled ablation or Coblation is capable of low temperature molecular disintegration within soft tissue causing its dissolution. This causes volumetric removal of tissue with minimal damage to adjacent tissue, that is, less collateral damage.[7] This technique has been widely used in otorhinolaryngology procedures such as tonsillectomy and adenoidectomy. In this study, we report our experience of adenoidectomy using Coblation, and its advantages, disadvantages, and significant outcomes are discussed.

Material and methods

This retrospective observational study was conducted in the, Department of ENT Nalanda Medical College and Hospital, Patna, Bihar, India for one year. after taking the approval of the protocol review committee and institutional ethics committee.

Methodology

Total 50 children below the age of 16 years who underwent coblation adenoidectomy were included in the study. Any patient who underwent combined procedure that is, adenotonsillectomy were excluded from the study. A detailed history was obtained and a complete ear, nose and throat examination was done in all patients. An X-ray nasopharynx lateral view soft tissue exposure or diagnostic nasal endoscopy was done to confirm the diagnosis.

A 0° endoscope was passed after nasal decongestion with 4% xylocaine and adrenaline solution. The nasal cavity and adenoids were inspected. A Boyle Davis mouth gag was applied and the Coblation® technology was utilized, with Procise™ XP or Procise™ MAX tips (Smith & Nephew Inc Cordova, TN, USA) being used to removeadenoid tissue and to achieve haemostasis simultaneously. Patients were evaluated on immediate post-operative period, during one week follow up and the parents of the patients were interviewed through telephone after three months and one year after surgery. To analyse the sleep and recurrent upper respiratory infections sleep disturbance and physical suffering domains of OSA-18 questionnaire developed by Franco et al was used.[7]

Results

In our study, coblation adenoidectomy was performed in 50 patients, includes 34 boys and 16 girls. The mean age was 8.1 years (males – 8.3 years and females – 8.1 years) and the age range was age range 2-16years. (Table 1)

Table 1: Gender distribution of patients

Gender	Number of patients= 50	%
Female	16	32
Male	34	68

Pre-operative symptom of disturbed sleep in patients is compared with post-operative sleep. Pre-operatively all 50 patients had disturbed sleep whereas in immediate post-operative period only 7 patients have disturbed sleep and all other 43 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	50	100	7	14
Comfortable sleep	0	0	43	86

Post-operative pain after coblation adenoidectomy was evaluated during immediate post-operative period and one week post-operatively. 76% patients did not have pain in immediate post-operative period and 90% 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	12	24	5	10
No pain	38	76	45	90

In our study, number of upper respiratory infections after the coblation adenoidectomy was evaluated. 36 (72%) patients had no episode of nasopharyngeal infection within the first one year. 14(28%) 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	14	28
Absent	36	72

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. 35(70%) patients had less than one day of hospital stay and 15(30%) patients had more than one day of hospital stay.

Discussion

Adenoidectomy is one of the commonest procedures performed by otorhinolaryngologists worldwide.[8] Adenoid hypertrophy is the unusual growth of the adenoid tissue in the nasopharynx. Due to repeated episodes of infections, the adenoid pad can remain hypertrophied for a long time, even in adulthood. Nasal obstruction, snoring, mouth breathing, aural fullness, and otitis media with effusion (OME), may occur as a result of this. Adenoid hypertrophy that causes inability to breathe through the nose, results in chronic mouth breathing and it can further lead to abnormalities in dental and facial growth. Treatment of adenoid hypertrophy often involves surgical removal. The ideal approach should relieve the obstruction and leave minimal or no tissue in the nasopharynx and achieve good postoperative result. The surgical procedures for adenoidectomy evolved during the course of time. The "blind curettage", although old, is still considered as the most basic, commonly performed, and widely available technique for adenoidectomy in many countries.[9] In the curettage method, adenoid tissue is removed from the posterior edge of the vomer inferiorly to the level of superior constrictor muscle.[10] Beneath this layer and behind the prevertebral fascia lie the cervical vertebrae and their contour is rounded, which does not match the perfectly straight edge of the instrument. This leads to remanent lateral lymphoid tissue in the nasopharynx, especially at the level of eustachian tube.[10] With the evolution of endoscopic sinus surgery, endoscopic visualization of the tissue to be removed is a rational and optimal surgical principle. The introduction of powered instrumentation like microdebriders has made many advantages for adenoidectomy, which allow more precise and efficient removal of adenoid tissue.[11] Although widely used technique, there is disadvantages like relatively limited manoeuvrability of the instrument in nasopharynx and difficulty in approaching the inferior nasopharynx. Coblation method uses bipolar radiofrequency energy for tissue dissolution at relatively low temperatures (between 40˚C and 70˚C) with simultaneous coagulation, thereby resulting in minimal intraoperative bleeding and rapid postoperative recovery after the procedure. In our study, pre-operative symptom of disturbed sleep in adenoid hyperplasia patients is compared with postoperative sleep. Pre-operatively 100% patients had disturbed sleep whereas post-operatively only 7(14%) patients have disturbed sleep and the rest 43(86%) patients have comfortable sleep. Chinawa et al studied that the commonest symptoms presented by almost all adenoid hyperplasia patients are cough, catarrh and snoring and mouth breathing especially at night.[12] Ferreira et al reported in their study that the pre- and postoperative evaluation of OSA-18 scores showed a statistically significant improvement with the mean preoperative OSA-18 score (±SD) was 77.25±6.07 and the post operative period score of patients who underwent coblation adenoidectomy decreased to 32.25±8.42.[13] Post-operative pain after coblation adenoidectomy was evaluated during immediate post-operative period and one week post-operatively. 76% patients did not have pain in immediate post-operative period and 90% had no pain when they visited hospital for first review, that is, one week after surgery. Businco et al compared cold curettage method with coblation adenoidectomy and stated that the patients had a pain score (±SD) of 7.15±1.46 and 3.85±1.53 on the same day of surgery with cold curettage method and coblation method respectively, which was statistically significant.[14] Major reason for extended stay in hospital is due the immediate post-operative pain. Since the immediate postoperative pain was negligible in coblation adenoidectomy, the time of hospital stay is also considerably reduced and increasing the acceptance of the procedure thereby. Length of hospital stay was evaluated on the basis of hospital stay less than one day and hospital stay more than one day. 70% patients had less than one day of hospital stay and 30% patients had more than one day of hospital stay. In our study, 72% patients had no episode of upper respiratory tract infection (URTI) within the first one year after surgery, 28% patients had one episode or more than one episode of infections. Reduction of post-operative URTI episodes, helps significantly in reducing the impact on scholastic and social performance of the patient. Bradoo et al stated that the endoscopic assisted adenoidectomy and conventional curettage method differed significantly in the amount of adenoid tissue left behind.[10] Following curettage adenoidectomy a large number (43.7%) of patients had moderate residual disease which later might lead to recurrence of symptoms. Although, this may not have clinical implications in the early post-operative period, but there is a definite possibility of regrowth of the residual adenoid tissue causing a recurrence of ear and nasal symptoms, which may lead to further episodes of upper respiratory infections. Further, the limitations in manoeuvering the

microdebrider in nasopharynx and increased bleeding due to cutting, residual adenoid tissue in the peritubal area may be left beyond due to apprehension on the part of the operating surgeon of damage to the tubal orifice and subsequent scarring.[10]

Conclusion

Endoscopic assisted coblation adenoidectomy is a safe and effective method of adenoidectomy. Endoscopic visualization is helpful in achieving a complete adenoidectomy and coblation method helps in a smooth and less painful post operative experience for the patients and family, with fewer complications in future. Despite all the advantages, the long learning curve and paucity of available coblation instruments are delaying the popularity of coblation adenoidectomy.

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