

## Original Research Article

# Role of coblation in reducing pain and morbidity of adenoidectomy

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## ABSTRACT

**Background:** Adenoidectomy is one of the most commonly performed paediatric surgical procedure by otorhinolaryngologists. Over the past few decades, adenoidectomy has evolved and different techniques have been proposed to reduce morbidity and surgical risk. Controlled ablation or Coblation® is capable of low temperature molecular disintegration within soft tissue causing its dissolution. In this study, we report our experience of adenoidectomy using Coblation®, and its role in reducing pain, morbidity and its significant outcomes are discussed.

**Methods:** A total number of 25 children aged 3-15 years, who underwent coblation adenoidectomy between March 2017 and April 2018 were included in this study.

**Results:** The mean age was 7.8 years (males 7.79 years and females 7.81 years). Pre operatively 100% patients had sleep disturbance and after coblation adenoidectomy only 12% patients have disturbed sleep and the rest 88% patients have comfortable sleep. 80% patients did not have pain in immediate post-operative period and 88% had no pain when they visited hospital for first review. 76% patients had less than one day of hospital stay and 24% patients had more than one day of hospital stay. 68% patients had no episode of upper respiratory tract infection (URTI) within the first one year after surgery.

**Conclusions:** Over the years, many different adenoidectomy techniques have evolved and is surgeon specific or centre specific. Endoscopic-assisted coblation adenoidectomy is a safe and effective method of adenoidectomy.

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

## INTRODUCTION

Adenoidectomy is one of the most commonly performed paediatric surgical procedure by otorhinolaryngologists. It is indicated for cases of clinically significant adenoid hypertrophy, which is the major cause of obstructive sleep disordered breathing (OSDB) in children.<sup>1</sup> Other indications include recurrent otitis media and otitis media with effusion. It is performed either alone or in association with tonsillectomy or myringotomy and grommet insertion. Adenoidectomy was developed in the pre-endoscopic era. Initially adenoidectomy was done using the conventional curettage method, which “blindly” removes the hyperplastic tissue. Although a widely

performed surgical technique, recent studies have revealed that it is not always possible to completely remove all adenoid tissue because it is not correctly visualized.<sup>2</sup>

Over the past few decades, adenoidectomy has evolved and different techniques have been proposed to reduce morbidity and surgical risk. With the advent of sinonasal endoscopy, it has become possible to remove adenoid tissue under direct visualization, with greater precision.<sup>2</sup> Along with endoscope, other modern surgical equipments were introduced in adenoidectomy procedure. Other surgical techniques include powered adenoidectomy, radiofrequency ablation (Coblation®) and the

electrocautery.<sup>3-5</sup> 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.<sup>6</sup> 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.

## METHODS

The retrospective observational study was carried out at the department of otorhinolaryngology, Believers Church Medical College Hospital, Thiruvalla, Kerala. A total number of 25 children aged 3-15 years, who underwent coblation adenoidectomy between March 2017 and April 2018 were considered in this study.

A detailed history was obtained during the time of admission, 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. The details were obtained from the out-patient and in-patient medical records.

### Inclusion criteria

All children below the age of 15 years who underwent coblation adenoidectomy between March 2017 and April 2018 with regular follow up in out-patient department and whose parents were available over telephone for phone interview were included in the study.

### Exclusion criteria

Any patient who was lost on follow up and those patients who underwent combined procedure that is, adenotonsillectomy were excluded from the study.

### Operative technique

#### Endoscopic-assisted coblation adenoidectomy

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 remove

adenoid 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.<sup>7</sup>

## RESULTS

In our study, coblation adenoidectomy was performed in 25 patients which included 14 boys and 11 girls. The mean age was 7.8 years (males - 7.79 years and females - 7.81 years) and the age range was age range 3-15 years Figure 1.

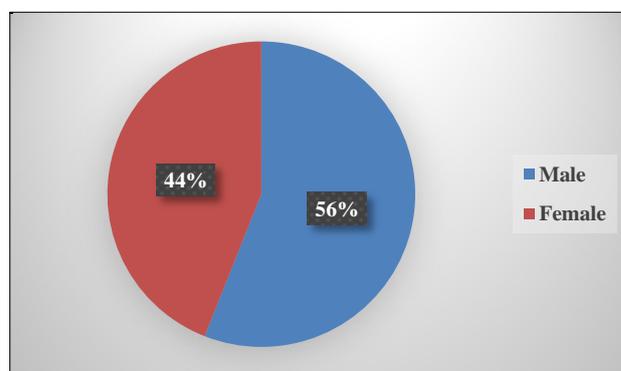


Figure 1: Sex distribution of total patients.

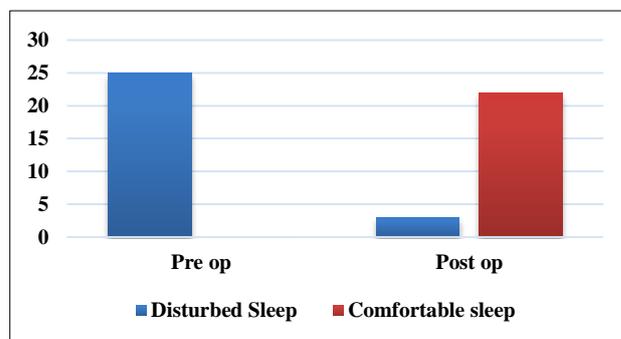
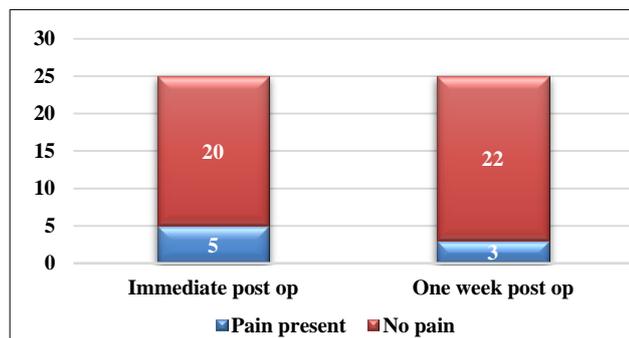


Figure 2: Comparison of sleep of patients in pre-op and post-op periods.

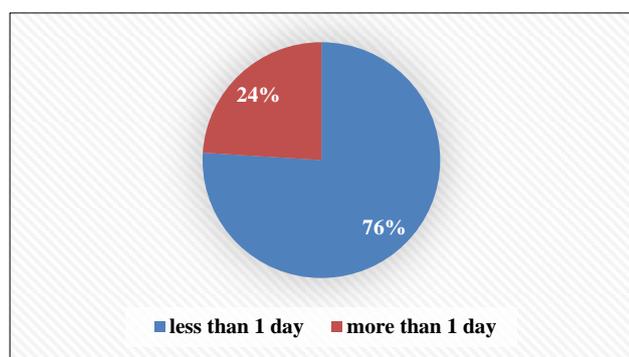
Pre-operative symptom of disturbed sleep in patients is compared with post-operative sleep. Pre-operatively all 25 patients had disturbed sleep whereas in immediate post-operative period only 3 patients have disturbed sleep and all other 22 patients have comfortable sleep Figure 2.

Post-operative pain after coblation adenoidectomy was evaluated during immediate post-operative period and one week post-operatively. 80% patients did not have pain in immediate post-operative period and 88% had no

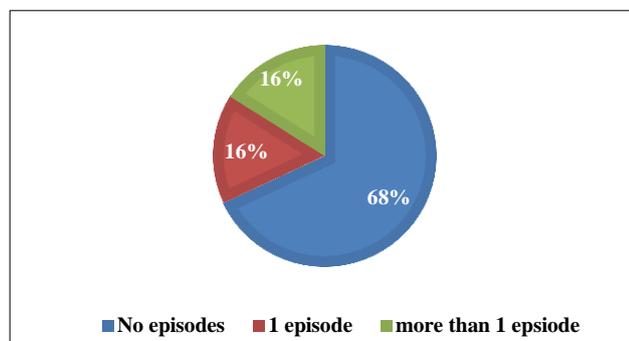
pain when they visited hospital for first review, that is, one week after surgery Figure 3.



**Figure 3: Pain during immediate post-op and one-week post-op.**



**Figure 4: Duration of hospital stay.**



**Figure 5: Upper respiratory infections within 1 year of surgery.**

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. 19 (76%) patients had less than one day of hospital stay and 6 (24%) patients had more than one day of hospital stay Figure 4.

In our study, number of upper respiratory infections after the coblation adenoidectomy was evaluated. 17 (68%) patients had no episode of nasopharyngeal infection within the first one year. 4 (16%) patients had one episode and 4 (16%) patients more than one episode of infections within the first one-year Figure 5.

**DISCUSSION**

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.<sup>8</sup> In the curettage method, adenoid tissue is removed from the posterior edge of the vomer inferiorly to the level of superior constrictor muscle.<sup>9</sup> 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.<sup>9</sup>

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.<sup>10</sup> 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 post-operative sleep. Pre-operatively 100% patients had disturbed sleep whereas post-operatively only 12% patients have disturbed sleep and the rest 88% 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.<sup>11</sup> 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  $32.25 \pm 8.42$ .<sup>12</sup>

Post-operative pain after coblation adenoidectomy was evaluated during immediate post-operative period and one week post-operatively. 80% patients did not have pain in immediate post-operative period and 88% 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 ( $\pm$ SD) of  $7.15 \pm 1.46$  and  $3.85 \pm 1.53$  on the same day of surgery with cold curettage method and coblation method respectively, which was statistically significant.<sup>13</sup>

Major reason for extended stay in hospital is due the immediate post-operative pain. Since the immediate post-operative 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. 76% patients had less than one day of hospital stay and 24% patients had more than one day of hospital stay.

In our study, 68% patients had no episode of upper respiratory tract infection (URTI) within the first one year after surgery, 16% patients had one episode and another 16% patients had 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.<sup>9</sup> 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 manoeuvring 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 or damage to the tubal orifice and subsequent scarring.<sup>9</sup>

## CONCLUSION

Adenoidectomy is one of the most commonly performed paediatric surgical procedure by otorhinolaryngologists. Over the years, many different techniques have evolved and is surgeon specific or centre specific. 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 less 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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