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Original Research Article

Transoral endoscopic coblation adenoidectomy - a novel approach of performing adenoidectomy in children

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ABSTRACT

Background: Adenoidectomy stands as one of the most frequently performed surgical procedures in children. Coblation adenoidectomy has emerged as a preferred method, with advantages such as diminished postoperative pain and swifter recovery. However, its application via trans nasal access in children, particularly those with anatomical variations, poses significant challenges. The aim of this study is to introduce and evaluate the advantages and limitations of transoral endoscopic coblation adenoidectomy in paediatric patients, with a focus on assessing its efficacy and safety.
Methods: A total of 80 children who presented to the outpatient department with chronic adenoid hypertrophy, aged between 2 and 12 years, were selected for participation in this study. Transoral coblation adenoidectomy was performed on all selected patients. The procedure was carried out with the patient placed in either Rose position or reverse Trendelenburg position, chosen randomly.
Results: Complete clearance of adenoid tissue was done under visualisation. There were no intraoperative adverse events. Bleeding during the procedure was minimal, suggesting excellent hemostasis. Postoperative pain reported by patients were minimal.
Conclusions: Transoral endoscopic coblation adenoidectomy stands as a promising approach in the management of chronic adenoid hypertrophy in children, offering more advantages in children with narrow airways and coexisting anatomical variations. The findings of this study support the notion that transoral endoscopic coblation adenoidectomy achieves complete clearance of adenoid tissue with minimal intraoperative adverse events and postoperative complications. Additionally, the procedure results in minimal postoperative pain and allows for shorter hospital stay.

Keywords: Adenoids, Coblation adenoidectomy, Endoscopic approach

INTRODUCTION

Adenoid hypertrophy is one of the major causes of nasal obstruction in children. It has been identified as one of the underlying cause for recurrent otitis media, obstructive sleep apnoea and recurrent sinusitis in children.[1] Symptoms of adenoid hypertrophy includes nose block, mouth breathing, recurrent ear infections and decreased hearing secondary to serous otitis media, facial changes, growth retardation, obstructive sleep apnoea and related complications.

Adenoid hypertrophy can be managed either medically with inhalational corticosteroids or surgically as adenoidectomy when not responding to medical management.[2] Adenoidectomy is one of the most common surgical procedures in children, whether performed alone or in association with other surgeries like tonsillectomy.[3]

According to the American Academy of Otolaryngology and Head and Neck Surgery (AAOHNS), the indications for adenoidectomy are: four or more episodes of recurrent suppurative rhinorrhea; sleep disorders with nasal

breathing obstruction; hyponasality; otitis media with tympanic effusion for more than 3 months; malocclusion or orofacial growth disorder; cardiopulmonary complications associated with upper airway obstruction, recurrent acute and chronic otitis media with tympanic effusion.[4]

Different adenoidectomy techniques have been proposed to reduce morbidity and surgical risks. Historically, cold curettage was the predominant technique used for adenoid removal. However, advancements in technology have led to the emergence of alternative methods. In 2007, it was observed in a survey reporting an increase in the use of electrocautery (26%), microdebrider (20%) and coblation (7%).[5] There is no more recent data, and these numbers may be currently different.

Coblation or 'controlled ablation' was first described in 2001, although its use in adenoidectomy began in 2005.[6,7] Coblation adenoidectomy has become the preferred method of choice among the otolaryngologists, as it only heats up to 60 °C, causing minimal damage to the surrounding tissue, thus by preventing injury to surrounding or deeper structures.

Coblation adenoidectomy is usually done transnasally, whereby a zero-degree endoscope is introduced via patient's nostril and thereafter coblation wand is introduced orally. Adenoid tissue is then coblated under direct vision. However, transnasal adenoidectomy may present its own challenges, due to narrow airway causing limitation in scope manipulations. The limited working space within nasal passages can make visualisation and manoeuvrability more difficult in children with anatomical variations like deviated nasal septum or turbinate hypertrophy.

A novel approach to coblation adenoidectomy, the transoral approach, has emerged as an alternative method for accessing and removing adenoid tissue through the oral cavity. This study aims to explore the advantages and potential limitations of transoral endoscopic coblation adenoidectomy in children.

METHODS

This prospective comparative study comparing trans nasal and trans oral approach for coblation adenoidectomy was carried out at Lifeline Hospital, Adoor, Kerala during the period October 2022-April 2023. Children within the age group of 2-12 years with signs of chronic adenoid hypertrophy, with recurrent episodes of adenoiditis, and scheduled exclusively for adenoidectomy were included in the study. Ethical clearance was obtained from the institutional ethical committee and an informed written consent was taken from the attendants of all the patients.

With an incidence of 20% adenoidectomy in the paediatric age group in India, the sample size was calculated using the formula given, where p=incidence of adenoidectomy, q=1-p and r=allowed error. In our study allowed error was set at 5%.

$$n = 4pq/r^2$$

Patients of craniofacial malformations like Down's syndrome, cleft palate, palatal insufficiency, severe anaemia and those requiring tonsillectomy with adenoidectomy were excluded from the study.

After obtaining detailed history and conducting clinical examination, assessment of size of adenoid was carried out by X-ray nasopharynx lateral view. Flexible or rigid endoscopy was done in all possible cases.

All cases which showed significant airway block in radiograph, more than 80% obstruction of choana on endoscopy was taken for adenoidectomy.

The data was tabulated using Microsoft excel and statistical analysis was done using statistical package for the social sciences (SPSS) software (version 27).

Procedure

Transoral endoscopic coblation adenoidectomy can be done either in rose position or reverse Trendelenburg position. Children were randomly divided into two groups of 40. Surgery was performed in first group with patient in rose position and second group in reverse Trendelenburg position.

Group 1

Under general anesthesia, children were positioned in the rose position, with a shoulder bag placed beneath the shoulders to ensure adequate neck extension.

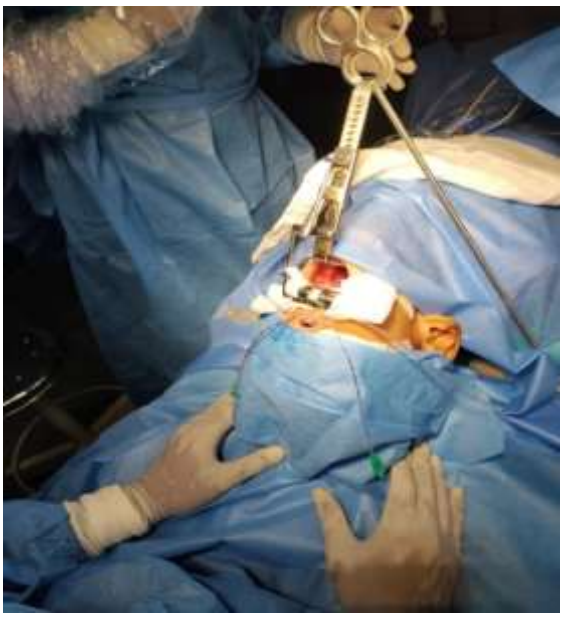

Figure 1: Group 1: patient in rose position.

Boyle Davis mouth gag was inserted, mouth was opened. A throat pack was placed to protect the oropharynx. An infant feeding tube, sized 6/7 based on individual cases, was then inserted through each nostril, passed out through the oral cavity, and secured to achieve soft palate retraction, thereby ensuring optimal exposure of the adenoid tissue (Figure 1).

70-degree endoscope was introduced via oral cavity and adenoid tissue was visualised as in the Figure 2.

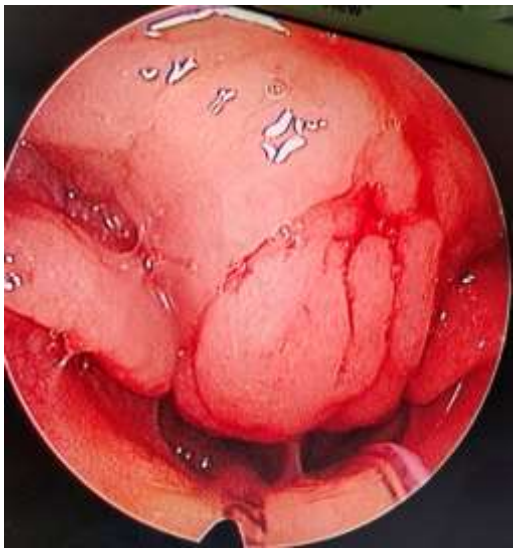

Figure 2: Endoscopic view of adenoid tissue.

Group 2

Under general anesthesia, children were positioned in reverse trendelenburg position, a mouth gag was inserted, and infant feeding tubes were introduced via each nostril (Figure 3).

Figure 3: Group 2: patient in reverse trendelenburg position.

70-degree endoscope was introduced via oral cavity, adenoid tissue visualised as in Figure 4.

Figure 4: Endoscopic view of adenoid tissue.

In both methods, a coblation wand was introduced through the oral cavity. Coblation adenoidectomy commenced, initiating ablation from the superior end near the Passavant's ridge. Ablation was conducted in a layered fashion. In cases where clearance appeared challenging with a straight wand, the coblation wand was bent near the region of the Eustachian tube orifices. Adenoid tissue removal proceeded until reaching the buccopharyngeal fascia, which served as the limit of dissection (Figure 5).

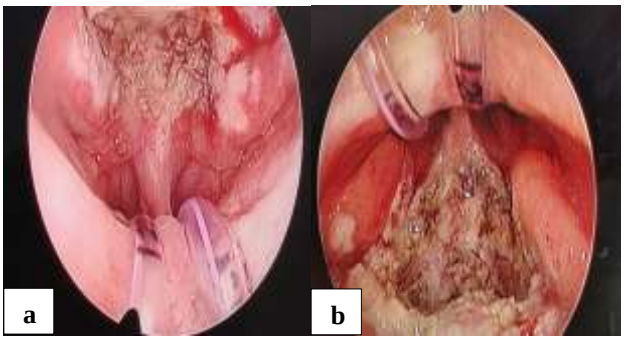

Figure 5: View after adenoidectomy (a) view in rose position, and (b) view as in reverse trendelenberg position.

RESULTS

80 children were included in our study. Most of the children were from the age group 4-6 years (Table 1).

Majority of the children were of were from the five-year age group, with four and six-year-olds following closely behind in frequency. Among the patients, there were 38 girls and 42 boys, indicating a relatively balanced distribution between genders.

Table 1: Age distribution.

Age in years	Number of patients
2	2
3	6
4	15
5	20
6	12
7	7
8	7
9	3
10	5
11	2
12	1

The most frequently reported complaints among patients included nose block, snoring, and mouth breathing. Among the patients, 24 individuals (30%) exhibited associated hearing loss, predominantly of a mild nature.

Myringotomy was required in 8 cases (10%) to address specific conditions. In two cases with moderate hearing loss, grommets were surgically inserted as treatment.

In both procedures, intraoperative bleeding remained minimal, effectively managed through the coagulation mode of coblation.

Post-operative pain was reported as minimal across all cases. All patients were discharged within 24 hours following their respective surgeries.

Monthly follow-up visits were conducted for up to 18 months post-surgery. Comprehensive symptomatic and endoscopic evaluations were performed in all cases, revealing no instances of recurrence.

DISCUSSION

Adenoidectomy can be performed using various methods, including curettage, microdebrider-assisted, and coblation-assisted techniques. Among these, coblation adenoidectomy is widely regarded as the safest and most commonly employed method.

We observed several advantages of coblation adenoidectomy, including reduced post-operative pain, improved hemostasis, and shorter hospital stays, allowing patients to be discharged on the day of surgery. Our findings align with a study by Mularczyk et al, which similarly reported superior pain control in the coblation group compared to the microdebrider group.[8]

Coblation adenoidectomy is typically performed using the trans nasal method, wherein an endoscope is inserted through the nostril while the coblation wand is introduced through the oral cavity. However, this approach can pose challenges in younger children due to their smaller nasal cavities. This difficulty is exacerbated when a paediatric scope is unavailable, making the manoeuvre particularly challenging for the surgeon.

In children with anatomical variations including nasal septal deviations, septal spurs, or turbinate hypertrophy, performing trans nasal coblation adenoidectomy can pose significant challenges. Even the use of decongestants may not alleviate these challenges effectively. Introducing an endoscope through the nose in such cases can increase the risk of nasal trauma and bleeding, potentially leading to the formation of synechiae. This, in turn, may result in nasal obstruction in the future.

Transoral endoscopic coblation adenoidectomy is a versatile approach suitable for patients of all age groups. This method proves particularly beneficial for young children with narrow nasal airways or anatomical variations such as nasal deviations. Additionally, it offers the advantage of effectively clearing adenoid tissue around the torus tubarius region, which may be challenging with the trans nasal approach.

However, this method does have some drawbacks, such as limited visualization of the buccopharyngeal fascia compared to the trans nasal technique.

Further research is needed to compare the efficacy and recurrence rates between the two methods. In our study, which included monthly follow-ups for 18 months, no instances of recurrence were observed across all age groups.

CONCLUSION

Transoral endoscopic coblation adenoidectomy emerges as a favourable method for performing adenoidectomy in young children, particularly in cases where nasal obstruction arises from septal deviation, mucosal edema, turbinate hypertrophy, and other obstructions. This approach offers distinct advantages by circumventing the risk of intraoperative nasal injury associated with manipulations, thereby mitigating the potential for complications such as post-operative synechiae formation. Given these benefits, transoral endoscopic coblation adenoidectomy represents a promising option for addressing adenoid-related issues in paediatric patients.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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