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Comparative study of incidence of secondary hemorrhage and severity of post operative pain between conventional adenoidectomy and debrider adenoidectomy

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Abstract

Background: Adenoidectomy is one of the most commonly performed surgical procedures in children. Conventional curettage adenoidectomy remains widely practiced; however newer techniques such as endoscopic microdebrider adenoidectomy offer improved visualization and precision. Despite these advancements, comparative evidence regarding postoperative pain and secondary hemorrhage between these techniques remains limited.

Objective: To compare postoperative pain and the incidence of secondary hemorrhage between conventional curettage adenoidectomy and microdebrideradenoidectomy.

Methods: This prospective comparative study was conducted at a tertiary care center from March 2024 to June 2025 and included 50 patients aged 3–18 years with chronic adenoiditis. Patients were allocated into two groups: Group A - conventional adenoidectomy (n=25) and Group B - microdebrideradenoidectomy (n=25). Postoperative pain was assessed using the Visual Analogue Scale (VAS) on postoperative days 0, 3, and 5. Patients were monitored for secondary hemorrhage up to postoperative day 7. Statistical analysis was performed using appropriate tests, with $p<0.05$ considered significant.

Results: Baseline characteristics were comparable between the two groups. Pain scores showed a significant reduction over time in both groups. However, there was no statistically significant difference in postoperative pain between the conventional and microdebrider groups at any time point ($p>0.05$). No cases of secondary hemorrhage were observed in either group.

Conclusion: Both conventional curettage and microdebrider-assisted adenoidectomy demonstrate comparable outcomes in terms of postoperative pain and secondary hemorrhage. The choice of technique may therefore be based on surgeon preference, expertise, and resource availability.

Keywords: *Adenoidectomy; Microdebrider; Postoperative pain; Secondary hemorrhage.*

INTRODUCTION

Adenoid is a midline lymphoid structure located in the posterosuperior aspect of the nasopharynx and a part of Waldeyers ring and it serves as the first line of the immunological defense [1]. It reaches its maximal physiological size between 3 and 7 years of age, corresponding to a period of heightened immunological activity in children. Subsequently, it undergoes gradual involution during adolescence. While this physiological enlargement is a normal developmental process, the adenoid assumes clinical significance when it undergoes pathological hypertrophy or becomes chronically infected by repeated exposure to pathogens.

Enlarged adenoids can lead to a spectrum of clinical manifestations viz nasal obstruction, mouth breathing, snoring, sleep-disordered breathing, and obstructive sleep apnea. Additionally, due to its proximity to the Eustachian tube orifices,

adenoid hypertrophy can contribute to Eustachian tube dysfunction, recurrent otitis media, and otitis media with effusion.[2] It increases morbidity and hence causes reduced quality of life and significant health burden in the pediatric population, particularly in developing countries such as India.[3]

When conservative medical management fails to alleviate symptoms of adenoid hypertrophy, surgical removal of the adenoid "adenoidectomy" is indicated.[4]

In contemporary practice, multiple surgical techniques are available for adenoidectomy. The conventional curettage method remains widely used due to its simplicity, cost-effectiveness, and minimal equipment requirements. However, it is a blind procedure, relying on tactile feedback rather than direct visualization. Advances in endoscopic technology have led to the development of more precise techniques, including microdebrider adenoidectomy, suction diathermy, and coblation. Among these, microdebrider-assisted adenoidectomy has gained popularity due to its ability to provide real-time visualization and controlled tissue removal.

This technique offers several theoretical advantages, including improved precision, reduced risk of residual tissue, and better hemostasis. However, it requires specialized equipment, training, and increased operative time compared to conventional methods.[5]

With the advent of newer surgical techniques, there has been increasing interest in evaluating their impact on postoperative outcomes. While microdebrider adenoidectomy offers improved visualization and precision, its superiority over conventional curettage in terms of postoperative pain and hemorrhage remains a subject of debate. Given these considerationsthe aim of this study was to Compare the incidence of secondary hemorrhage and severity of post operative pain between conventional adenoidectomy and debrider adenoidectomy

METHODS AND MATERIALS

Study Design: Prospective Study

Study Area: ENT department, Vydehi Institute of Medical Sciences and Research Centre, Bengaluru

Study Duration: March 2024 to June 2025 (one and half year)

Study Population: Study was conducted among patients with clinically diagnosed chronic adenoiditis , attending ENT outpatient department and inpatient department of Vydehi Institute Of Medical Sciences and Research Centre, Bengaluru, after getting the informed consent for adenoidectomy and briefly explaining the patient in the language that he/she understands

Inclusion Criteria:

1. Patients age between 3-18 years of age, of both male and female sex.
2. Patients who have given Written Informed Consent
3. Adenoid hypertrophy as the only cause for nasal obstruction, mouth breathing and snoring
4. X-ray evidence of adenoid hypertrophy occupying > 50% of airway in the study.

Exclusion criteria:

1 Patient less than 3 years and more than 18 years of age.
2 Bleeding or coagulation defects
3 Craniofacial abnormalities.
4 Acute upper respiratory tract infections.
5 Velopharyngeal insufficiency

Methodology

After a thorough ENT evaluation and necessary preoperative investigations , informed written consent was obtained from all patients selected for the study. Patients were allocated into two groups: Group A - conventional adenoidectomy (n=25) and Group B - microdebrideradenoidectomy (n=25). All patients were operated under general anaesthesia .

Group A: Patient is positioned in Rose position and Boyle Davis mouth gag was placed and secured with Draffin bipod. The hard palate was palpated digitally to exclude submucous cleft palate. Then nasopharynx was palpated and the adenoid mass brought into midline. Appropriate sized St. Claire Thompson adenoid curette was selected and introduced into the nasopharynx.Then it was hitched against the Vomer then pressed inferiorly to fit snugly into the adenoid mass.The curette was swept inferiorly with a side to side rocking motion to completely remove all the adenoid tissue. Gauze packs were kept in the nasopharynx to achieve haemostasis.

Group B : Nasal cavities were decongested by using pledgets soaked in 4% lignocaine with 1:10,000 adrenaline. Mouth gag was applied. Using a 0° 2.7 mm rigid telescope (4 mm for older children), the posterior choanae and nasopharynx

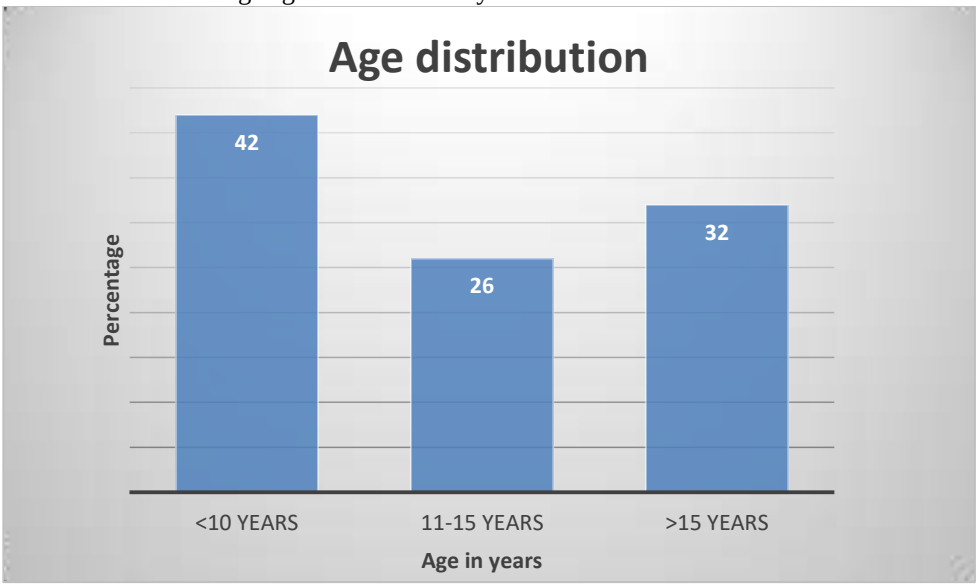
were visualized. Microdebrider with angled blade (60°) was passed through the oral cavity & oropharynx to reach nasopahrynx. Adenoid tissue was debrider from its inferior end till the roof of nasopharynx till perimyseum of posterior nasopharyngeal wall was visible.

Postoperative follow up: For post operative pain, patients were followed up on day 0,3,5 (using Visual Analogue Scale) . For secondary hemorrhage, patients were monitored from day 5 to day 7 and then once after 15 days and SOS . Questionnaire was used for assessment of the post operative pain and secondary haemorrhage.

RESULTS

Distribution according to Age

The age distribution among the 50 patients undergoing adenoidectomy reveals a predominance of younger children, with 42% (21 patients) aged under 10 years, reflecting the typical pediatric presentation of adenoid hypertrophy leading to symptoms like obstructive sleep apnea and recurrent infections, which aligns with the study's objective to compare postoperative outcomes in this vulnerable group. Individuals aged 11-15 years comprised 26% (13 patients), while those over 15 years accounted for 32% (16 patients), indicating a notable inclusion of adolescents possibly with persistent or severe chronic adenoiditis. The average age was 11.8 ± 4.7 years.

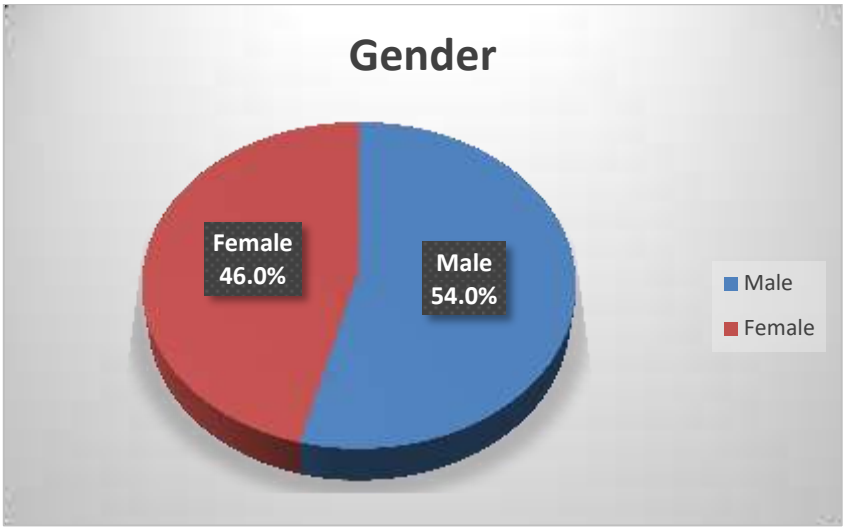


Age distribution according to type of surgery

Age in years	Surgery				Total	
	CONVENTIONAL ADENOIDECTOMY		DEBRIDER ADENOIDECTOMY			
	n	%	n	%	n	%
<10 years	8	32.0	13	52.0	21	42.0
11-15 years	9	36.0	4	16.0	13	26.0
>15 years	8	32.0	8	32.0	16	32.0
Total	25	100.0	25	100.0	50	100.0

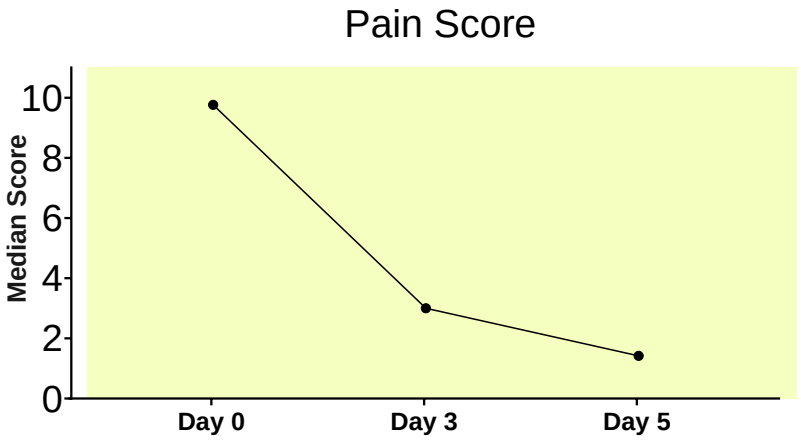
Gender distribution

The cohort consists of 50 patients where males comprise 54% (27 patients) and females are 46% (23 patients) hence showing male predominance

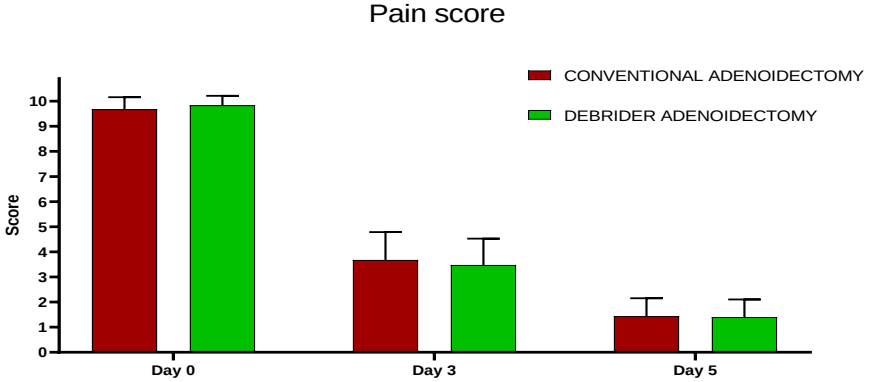


Postoperative Pain Scores Over Time

Postoperative pain, assessed via visual analogue scale (VAS, presumptively 0-10), exhibited a marked decline from day 0 to day 5, starting at a high mean of 9.8 ± 0.4 (range 9-10, median 10, IQR 9.75-10), indicative of near-maximal immediate discomfort universally across patients regardless of technique. By day 3, pain reduced substantially to 3.6 ± 1.1 (range 2-6, median 3, IQR 3-4.25), reflecting effective analgesic management and natural resolution, while day 5 scores further dropped to 1.4 ± 0.7 (range 1-3, median 1, IQR 1-2), approaching negligible levels.



Pain score	CONVENTIONAL ADENOIDECTOMY (n=25)		DEBRIDER ADENOIDECTOMY (n=25)		Independent sample t test	
	Mean	SD	Mean	SD	t	p
DAY 0	9.7	0.5	9.8	0.4	-1.321	0.193
DAY 3	3.7	1.1	3.5	1.0	0.657	0.515
DAY 5	1.4	0.7	1.4	0.7	0.199	0.843



Postoperative pain scores on the visual analogue scale showed no significant differences between conventional adenoidectomy (n=25) and debrider-assisted adenoidectomy (n=25) across assessment days, with day 0 value at 9.7 versus 9.8 ; day 3 at 3.7 versus 3.5 and day 5 at 1.4 for both indicating equivalent severity trajectories

Incidence of secondary hemorrhage

SECONDARY HEMORRHAGE	Frequency	%
PRESENT	0	0
ABSENT	50	100

In this prospective cohort of 50 patients undergoing either conventional or debrider-assisted adenoidectomy, secondary hemorrhage was entirely absent,with 100% (50 patients) reporting nil occurrences.

DISCUSSION

Our prospective study at Vydehi Institute of Medical Sciences, Bengaluru, from March 2024 to August 2025, compared conventional curettage adenoidectomy with debrider adenoidectomy in 50 patients with clinically diagnosed adenoiditis. Block randomization yielded balanced groups of 25 each. We focused on secondary hemorrhage after day 5 and postoperative pain via visual analogue scale (VAS) on days 0, 3, and 5. Age profile ranged from 4-18 years—with 42% under 10 years, 26% aged 11-15, and 32% over 15 (mean 11.8 ± 4.7 years). Age distribution according the surgery they underwent showed even distribution: conventional had 32% <10 years , 36% belonging to age 11-15 years , 32% belonged to age more than 15 years ; debrider adenoidectomy also mirrored with 52% in age less than 10 years , 16% between the ages 11-15 years , 32% of the age group >15 . There was No confounding here. In our study there was male gender predominance 54% (27 patients) overall, 48% conventional , 60% debrider . Patient suffered from the following symptoms : Mouth breathing 72% , adenoid facies 28% due to early detection, recurrent URTI 48%, nasal obstruction 36% , epistaxis 12% and reduced hearing 22% . Patients presented with garde 2(28%) , grade 3 (48%) and grade 4 (28%). the weightage of the symptoms were comparable to the study conducted by Kozcu SH, Demirhan E, Cukurova I executed an RCT in 80 children. [5]

According to the prospective study conducted by Datta R, Singh VP on 40 children (mean age 7.2 years, 60% male:comparable to our study) , undergoing adenoidectomy alone, randomizing to conventional (n=20) or endoscopic powered (microdebrider, n=20), the reported pain scores (VAS) for microdebrider adenoidectomy was lower than conventional adenoidectomy, concluding less pain with powered method ($p<0.05$ for differences)[6] . According to the study conducted by Abo Elmagd EA et al on 30 children, pain scores were higher in microdebrider than conventional, attributed to vibration trauma.[7]. An RCT conducted by Juneja R et al on 60 children reported that VAS pain was lower in powered (mean 4.24) than conventional (6.20, $p<0.001$), with less bleeding[8]. In a similar study by Yadam AM et al, who compared microdebrider vs curettage technique , pain was similar in both the groups [9]. In our study pain declined sharply overall: day 0 : 9.8±0.4, day 3 :3.6±1.1, day 5 :1.4±0.7. By group: day 0: 9.7±0.5 vs 9.8±0.4 ; day 3: 3.7±1.1 vs 3.5±1.0 ; day : 1.4±0.7 both . Equivalence was seen , hence slightly shows higher pain in the microdebrider group on the first day , followed by similar pain score in both the groups.

Our pain parity intrigues against mixed priors. Elmagd et al's higher microdebrider pain may reflect vibrational pain. Our day 0 uniformity in both groups suggests masking by analgesia. [7] Datta et al's lower pain in powered adenoidectomy ; our study show variability they lacked, across.[6] Juneja's powered adenoidectomy showed an advantage contrasts to our day 5 VAS score , perhaps their single-point VAS missed trajectory; our multi-day captures resolution.[8]

In our study secondary hemorrhage was zero overall. Rare event, but novel data. According to the study conducted by Tomlinson D et al who prospectively tracked 5,588 Welsh adenoidectomies incidence of primary hemorrhage was 0.4% and secondary hemorrhage was 0%. It matches our data of 0% secondary hemorrhage perfectly; their larger sample size confirms rarity.[10]

In Basista's microdebrider series (38 kids) the data was comparable to ours : minimal pain 13%, quick recovery.(11)
In our study we wanted to infer whether the microdebrider adenoidectomy was superior in term of post operative pain compared to the conventional pain , There were descrepencies among different studies : Elmagd -higher pain (7), Datta/Juneja -lower pain score (6/8). It shows that the pain score is comparable in both the groups , adequate analgesia playing the key role . Hence at a resource limited settings conventional adenoidectomy will suffice.

CONCLUSION

Both conventional curettage and microdebrider-assisted adenoidectomy are safe and effective techniques with comparable outcomes in postoperative pain and secondary hemorrhage.

LIMITATIONS OF THE STUDY

In spite of every sincere effort my study has lacunae. The notable short comings of this study are:

1. The sample size was small. Only 50 cases are not sufficient for this kind of study.
2. The study has been done in a single centre.
3. The study was carried out in a tertiary care hospital, so hospital bias cannot be ruled out.
4. Study does not compare the residual adenoid tissue after either procedure. Which has an impact on recurrence

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