Section: ENT

Original Research Article

A COMPARATIVE ANALYSIS OF CONVENTIONAL AND ENDOSCOPIC POWERED TECHNIQUES IN ADENOIDECTOMY

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ABSTRACT

Background: Adenoidectomy is a common pediatric procedure for conditions like otitis media, chronic rhinosinusitis, and obstructive sleep apnea. Conventional methods often involve curettage and sharp dissection, with potential complications like bleeding and prolonged recovery. Endoscopic powered adenoidectomy (EPA) uses advanced technology for more precise, safer, and quicker tissue removal. This study compares techniques' surgical outcomes, complication rates, and recovery times to guide better clinical practices. The aim is to compare the effectiveness, safety, and outcomes of conventional versus endoscopic powered adenoidectomy techniques. **Materials and Methods:** A prospective observational comparative study were done in Medica Super specialty Hospital Kolkata. Period of study 1 year and total sample size were 70. **Result:** Group A (Conventional) had a mean age of 8.14 years and operative time of 29.3 mins; Group B (Powered Endoscopic) had a mean age of 9.2 years and operative time of 39.3 mins ($p < 0.05$). Blood loss was 21 ml in Group A vs. 31.67 ml in Group B ($p < 0.05$). Post-op pain was comparable (2.64 vs. 2.13; $p > 0.05$), but recovery was faster in Group B (2.93 vs. 3.5 days; $p < 0.05$). **Conclusion:** The study compares conventional adenoidectomy and powered endoscopic adenoidectomy, finding that powered endoscopic adenoidectomy offers shorter recovery time and comparable pain levels, while requiring longer operative time and higher intraoperative blood loss. It suggests powered endoscopic adenoidectomy may be a valuable alternative for pediatric patients.

INTRODUCTION

Adenoidectomy, the surgical removal of the adenoids, is one of the most common procedures performed in pediatric otolaryngology, particularly in cases involving recurrent otitis media, chronic rhinosinusitis, and obstructive sleep apnea.[1] Traditionally, adenoidectomy has been performed using conventional methods, including curettage and sharp dissection with surgical instruments such as the adenoid curette and suction apparatus. While effective, these methods are often associated with potential complications such as bleeding, postoperative pain, and longer recovery times.[2]

With the advancement of medical technology, endoscopic techniques have emerged as an alternative to conventional adenoidectomy. Endoscopic-assisted adenoidectomy utilizes a specialized camera system (endoscope) to provide enhanced visualization of the adenoid tissue, allowing for more precise and less invasive tissue removal. Endoscopic powered adenoidectomy (EPA) uses powered instruments such as microdebriders to remove adenoid tissue, which is often considered safer, faster, and associated with less bleeding compared to the conventional approach.[3]

Several studies have compared the conventional and endoscopic techniques with respect to various factors, including surgical outcomes, complications, and recovery times. However, there is a lack of comprehensive studies that specifically address these two methods' comparative effectiveness in terms of postoperative pain, recovery, and complications, making it important to explore their relative advantages and disadvantages further.[4]

This study aims to conduct a comparative analysis between conventional and endoscopic powered adenoidectomy. The goal is to assess the differences

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in surgical outcomes, complication rates, and recovery times in order to provide better clinical guidelines for pediatric patients requiring adenoidectomy. To compare the effectiveness, safety, and outcomes of conventional versus endoscopic powered adenoidectomy techniques.

MATERIALS AND METHODS

Type of study: Prospective comparative observational study
Place of study: Department of E.N.T, Medica Super specialty Hospital Kolkata.
Study duration: 1 year Jan 2024 to Dec 2024.
Sample size: 70
Inclusion Criteria:

- Patients diagnosed with adenoid hypertrophy or related conditions.
- Age group: Children and/or adolescents (e.g., 2 to 18 years).
- Patients scheduled for adenoidectomy.

Exclusion Criteria:

- Patients with contraindications for surgery (e.g., severe systemic conditions).
- Patients with coexisting nasal or paranasal sinus disorders requiring concurrent surgery.
- Patients who have undergone previous adenoidectomy.
- Incomplete medical records or follow-up data.
- Patients with known allergies to anesthesia or surgical materials.

Statistical Analysis:
Data were entered into Excel and analyzed using SPSS and GraphPad Prism. Numerical variables were summarized using means and standard deviations, while categorical variables were described with counts and percentages. Two-sample t-tests were used to compare independent groups, while paired t-tests accounted for correlations in paired data. Chi-square tests (including Fisher's exact test for small sample sizes) were used for categorical data comparisons. P-values ≤ 0.05 were considered statistically significant.

RESULTS

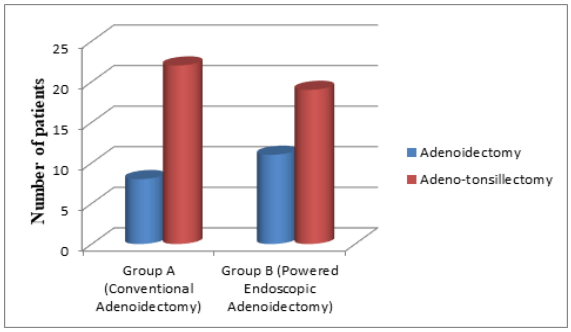

Figure 1: Showing Association between Surgeries Performed in the Two Groups

The mean age of the patients in Group A (Conventional Adenoidectomy) was 8.14 years, whereas the mean age in Group B (Powered Endoscopic Adenoidectomy) was 9.2 years.

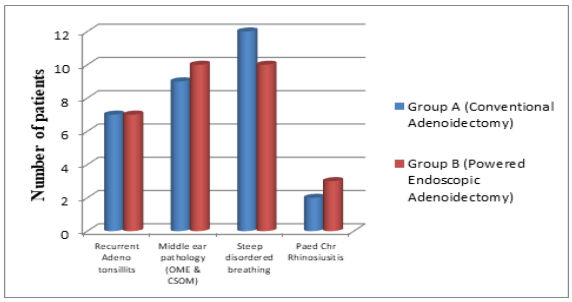

Figure 2: showing Association between Indications of surgery in the two groups

The mean operative time for Group A (Conventional Adenoidectomy) was 29.3 minutes, with a range of 22 to 39 minutes and a 95% confidence interval of 27.7 to 30.9 minutes. In contrast, Group B (Powered Endoscopic Adenoidectomy) had a higher mean operative time of 39.3 minutes, ranging from 27 to 55 minutes, with a 95% confidence interval of 36.6 to 41.9 minutes.
The difference in operative time between the two groups was found to be statistically significant ($p < 0.05$),
The average intra-operative blood loss in Group A (Conventional Adenoidectomy) was 21 ml, with a range of 10 to 50 ml. In contrast, Group B (Powered Endoscopic Adenoidectomy) had a higher average blood loss of 31.67 ml, ranging from 10 to 60 ml. The difference in blood loss between the two groups was found to be statistically significant ($p < 0.05$)
The post-operative pain scores, presented as 95% confidence intervals, were slightly lower in Group B (Powered Endoscopic), with a mean of 2.13 compared to 2.64 in Group A (Conventional). However, this difference was not statistically significant ($p > 0.05$), indicating that both procedures resulted in comparable levels of post-operative discomfort. In contrast, the mean recovery period was significantly shorter in Group B (2.93 days) compared to Group A (3.5 days), with the difference being statistically significant ($p < 0.05$). This suggests that patients undergoing powered endoscopic adenoidectomy may return to normal activities faster than those undergoing the conventional technique.
In Group A (Conventional Adenoidectomy), 8 patients underwent adenoidectomy alone, while 22 patients underwent adeno-tonsillectomy. In Group B (Powered Endoscopic Adenoidectomy), 11 patients underwent adenoidectomy alone, and 19 patients underwent adeno-tonsillectomy.
In both groups, sleep-disordered breathing was the most common indication for surgery, noted in 12 patients in Group A and 10 in Group B. This was followed by middle ear pathology (OME & CSOM), with 9 cases in Group A and 10 cases in Group B.
Recurrent adenotonsillitis was an equally frequent indication in both groups (7 patients each), while

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pediatric chronic rhinosinusitis was a less common indication, reported in 2 patients in Group A and 3 in Group B.

Table 1: Table showing Association between Age

	Group A (Conventional Adenoidectomy)	Group B (Powered Endoscopic Adenoidectomy)
Mean Age (in years)	8.14	9.2

Table 2: Table showing Association between Comparisons of operative time.

Group	Time Range (minutes)	Mean Time (minutes)	95% Confidence Interval	Significance (p-value)
Group A (Conventional)	22 – 39	29.3	27.7 – 30.9	$p < 0.05$ (Significant)
Group B (Powered Endoscopic)	27 – 55	39.3	36.6 – 41.9	

Table 3: Table showing distribution of Comparison of Intra-Operative Blood LOSS

Group	Blood Loss Range (ml)	Average Blood Loss (ml)	Significance (p-value)
Group A (Conventional)	10 – 50 ml	21 ml	$p < 0.05$ (Significant)
Group B (Powered Endoscopic)	10 – 60 ml	31.67 ml	

Table 4: Table showing Association between Comparative post-operative pains in the two procedures

Parameter	Group A (Conventional)	Group B (Powered Endoscopic)	Significance (p-value)
Pain Score (95% CI)	1.64 – 2.64 – 3.63	1.19 – 2.13 – 3.06	$p > 0.05$ (Not Significant)
Mean Recovery Period	3.5 days	2.93 days	$p < 0.05$ (Significant)

DISCUSSION

Demographic Characteristics: The mean age of patients in Group A was 8.14 years, while in Group B, it was 9.2 years. This slight age difference is consistent with previous studies, such as Datta et al,[5] (2009), who reported a mean age of 10.0 ± 2.42 years in Group A and 9.0 ± 2.87 years in Group B. The comparable age distribution across both groups supports the validity of our comparisons.

Operative Time: Group A had a mean operative time of 29.3 minutes, whereas Group B had a longer mean of 39.3 minutes ($p < 0.05$). This aligns with findings from other studies, such as one by Shaweta et al (2018),[6] which reported similar operative times between the two groups, suggesting that the powered technique may require more time due to the precision and equipment setup involved.

Intra-operative Blood Loss: Regarding intra-operative blood loss, our study observed an average of 21 ml in Group A and 31.67 ml in Group B, with a statistically significant difference ($p < 0.05$). This aligns with the findings of Datta et al. [5] (2009), who reported average blood losses of 18.4 ± 4.72 ml in Group A and 29.32 ± 2.59 ml in Group B ($p < 0.0001$). The increased blood loss in the powered endoscopic group may be attributed to prolonged exposure of the surgical site during the procedure.

Post-operative Pain and Recovery: Our study found no significant difference in post-operative pain scores between the two groups ($p > 0.05$). However, the mean recovery period was shorter in Group B (2.93 days) compared to Group A (3.5 days), with a statistically significant difference ($p < 0.05$). This is consistent with the findings of Datta et al (2009),[5] who reported a mean recovery time of 4.93 days for Group A and 3.06 days for Group B ($p = 0.00$) . The shorter recovery time in the powered endoscopic group may be due to more precise tissue removal and reduced post-operative inflammation.

Surgical Indications: Sleep-disordered breathing was the most common indication for surgery in both groups, followed by middle ear pathology (OME & CSOM). These findings are consistent with the study by Datta et al (2009),[5] who reported similar indications for surgery in their patient population.

CONCLUSION

In conclusion, this comparative study between conventional adenoidectomy and powered endoscopic adenoidectomy demonstrates that while the powered endoscopic approach is associated with a longer operative time and slightly higher intraoperative blood loss, it offers notable advantages in terms of a significantly shorter recovery period and comparable postoperative pain levels. Both techniques were similarly effective in addressing common indications such as sleep-disordered breathing and middle ear pathology, with no major differences in the distribution of surgical indications or associated procedures like adeno-tonsillectomy. The findings suggest that powered endoscopic adenoidectomy may provide improved surgical precision and faster post-operative recovery, making it a valuable alternative to the conventional technique in pediatric patients.

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