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Original Research Article

Comparison of microdebrider assisted adenoidectomy and adenoid curette adenoidectomy

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ABSTRACT

Background: Adenoidectomy is the surgical procedure to remove the adenoids. It is conventionally performed using the curettage method. The aim is to compare between adenoid curette adenoidectomy and microdebrider assisted adenoidectomy.
Methods: From April 2016 to March 2017, 50 patients (34 males and 16 females), requiring adenoidectomy were randomized into two groups each of twenty five. Group A underwent microdebrider assisted adenoidectomy. Group B underwent conventional adenoidectomy using the curettage method. The parameters studied were intra-operative time, blood loss, residual tissue, associated trauma, and post-operative symptomatic relief and complications.
Results: Microdebrider assisted adenoidectomy was significantly better in terms of residual tissue left behind as compared to adenoid curette adenoidectomy ($p<0.001$), similar operative blood loss and operative time with no difference in complications.
Conclusions: Microdebrider-assisted adenoidectomy is a safe and effective alternative to curettage method as it allows complete removal of adenoid tissue under direct vision.

Keywords: Microdebrider, Adenoidectomy, Intra-operative, Microdebrider-assisted

INTRODUCTION

Adenoid is a part of Waldeyer's ring. It was initially described by Meyer in 1968. Adenoids provide protection against bacterial infection, viral infection and against various toxins.[1]

The size of adenoid increases during the first 6 to 8 years and gradually decreases by adolescence.[2]

An adenoidectomy can be done as an isolated procedure or as a part of an adenotonsillectomy operation. Adenoidectomy is conventionally performed with an adenoid curette. This surgery is a blind procedure. It was described since 1885.[3]

Various methods have been developed either used alone or in the combinations, such as monopolar and bipolar diathermy, radiofrequency, laser, microdebrider, stripping under endoscopic control and coblation. The aim is to reduce operative time, intra-operative blood loss, and post-operative morbidity.[4]

Powered instrumentation is an important tool for sinus surgeons. Further development is power assisted adenoidectomy. This surgical technique used can have considerable influence on the duration of surgery, intra-operative bleeding, post-operative pain, recovery time and completeness of removal of the adenoid tissue.[5]

We propose the use of microdebrider-assisted adenoidectomy method over the conventional

adenoidectomy method. In this study, we compared the surgical outcome of adenoid curette adenoidectomy and microdebrider assisted adenoidectomy, the advantages and complications associated with microdebrider and also compared operative time, blood loss and residual tissue.

METHODS

This study was a prospective randomized interventional study conducted in the department of ENT and HNS at Indira Gandhi Medical College, Shimla, Himachal Pradesh, India. The study was done for a period of 1 year (duration from April 1, 2016 to March 31, 2017), after the approval of Institutional Research and Ethics Committee). The study was aimed to compare adenoid curette adenoidectomy and microdebrider assisted adenoidectomy.

A total number of 50 patients were taken, out of which 25 patients underwent adenoid curette adenoidectomy and rest 25 underwent microdebrider assisted adenoidectomy, were included in this study after taking prior written consent.

Inclusion criteria

Children having age of 2-16 years; various signs and or symptoms of chronic adenoiditis such as nasal obstruction, mouth breathing, snoring, and witnessed apnoea; adenoid hypertrophy confirmed on X-ray nasopharynx.

Exclusion criteria

Children having neuromuscular disorders or craniofacial anomalies (submucous cleft, cleft palate); previously underwent adenoidectomy; significant deviated nasal septum; bleeding disorders.

Methodology

Patients of either sex, having symptoms and signs suggestive of chronic adenoiditis and fulfilling the inclusion criteria was enrolled in the study.

Informed consent was obtained. Detailed evaluation of patient including history, routine blood investigation, X-ray nasopharynx was done.

Patients were randomly divided in two groups A and B.

Group A: Microdebrider assisted adenoidectomy

Group B: Adenoid curette adenoidectomy

Surgical methods

Initial steps common to both surgical techniques

An adenoidectomy was performed under general anesthesia with orotracheal intubation. The patient was covered with sterile drapes, and the palate was palpated to exclude a submucosal clefting. After these common steps, either curette adenoidectomy or microdebrider assisted adenoidectomy was used for performing adenoidectomy. The recording of operative time started when a microdebrider or a curette first touched the adenoid tissue, and stopped when the hemostasis was announced to be complete by the surgeon. The length of the procedure was recorded in minutes and seconds.

Microdebrider assisted adenoidectomy technique

The patient was placed in supine position and while performing the procedure, the surgeon was standing on the right side of the patient.

A Boyle-Davis mouth gag was used to open the mouth. The soft palate was retracted with bilateral rubber catheters passed from the nose to mouth and the two ends clamped tightly by artery forceps.

The tip of the microdebrider guarding an inner rotating blade had a cutting window for resection of adenoid tissue.

Under an endoscopic view of a 0° or 30^0 the microdebrider was inserted transorally into the nasopharyngeal hollow and the foot switch was depressed to adjust the blade at a speed of 1,500 rpm in oscillating mode. The handpiece of the microdebrider was connected to a continuous suction and irrigation system, and the adenoid tissue sucked into the cutting window was resected by the rotating blade. Microdebrider assisted adenoidectomy began from the choanal sill, and the resection was performed with a side-to-side sweeping motion of the microdebrider, progressing posteriorly and inferiorly until the inferior border of the adenoid pad was reached. Care was taken to preserve the velopharyngeal function by leaving a rim of adenoid tissue just above the Passavant's ridge. Furthermore, for the resection of peritubaric and laterally based adenoid tissue, the shaver worked in the furrow between the adenoid pad and the lateral nasopharyngeal wall. Ample care was taken by keeping the tip of the microdebrider under continuous endoscopic view all through the operation to protect the nearby structures. A gentle resection was performed to keep the depth of resection on a level above the prevertebral fascia.

Adenoid curette adenoidectomy technique

The child was placed in the rose position, with a roll under the shoulders and a head ring enhancing neck extension. While performing the procedure, surgeon was standing on the head end of the patient. The adenoid mass was examined with digital palpation, and removed with a proper adenoid curette having a horizontal sharp edge for cutting through the adenoid base. Initially, a large adenoid curette was swept from the posterior border of the vomer to the inferior margin of the nasopharyngeal

hollow with a slight side-to-side rocking motion. After removing the bulk of adenoid mass, the procedure was repeated with medium and smaller-sized curettes to remove choanal and peritubaric adenoid tissue. Removal was then confirmed by using an endoscopic examination.

End steps common to both surgical techniques

For hemostasis, a tonsil pack was placed in the operative field for a period of approximately 60 seconds, and then removed. In all patients, any remaining bleeding point was controlled with bipolar electrocautery at a low power setting. After achieving hemostasis, the hardware was removed, and the child was left to the anesthetist. Intraoperative and immediate complications (e.g., hemorrhage, injury to a neighbouring structure, laryngospasm, and prolonged recovery) were recorded.

Endoscopic examination was done for residual tissue after surgery.

Postoperative follow-up

A control examination was performed after 1 month, and surgical outcome and complications were noted.

Statistical analysis

The statistical analysis was done using SPSS (Statistical Package for Social Sciences) version 17. Data was analyzed as categorical variables using Chi-square test and Fisher's exact test. Level of significance (α) was set at 5%. Hence, a $p<0.05$ was accepted as statistically significant.

RESULTS

A total number of 50 patients were screened for this study out of which 25 patients were underwent Adenoid curette adenoidectomy and rest of the 25 underwent microdebrider assisted adenoidectomy.

Table 1: Demographic profile of patients under study.

Gender	Group A	Group B	Total (%)
Male	18	16	34 (68.0)
Female	7	9	16 (32)

In the present study, overall sex distribution showed a male preponderance of 68%, only 32% were females. P value was 0.544 which was statistically insignificant (chi squared p=0.05; level of significance=5%) (Table 1).

Results of the study were evaluated using various parameters.

There was a greater incidence of higher grade of residual adenoid tissue post-operatively in Group B as compared to Group A ($p<0.001$) (Figure 1).

Table 2: Operative time.

Operative time (Min)	Group A	Group B	Total (%)
10-20	14	14	28 (56)
20-30	9	11	20 (40)
>30	2	0	2 (4)

Table 3: Blood loss.

Blood loss (ml)	Group A	Group B	Total (%)
<10	3	1	4 (8)
10-20	18	21	39 (78)
20-30	2	3	5 (10)
>30	2	0	2 (4)

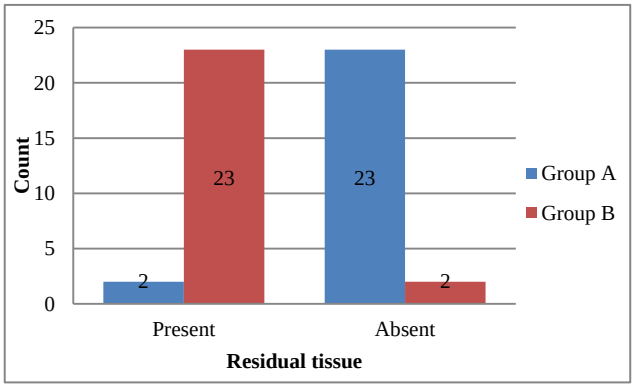

Figure 1: Residual tissue.

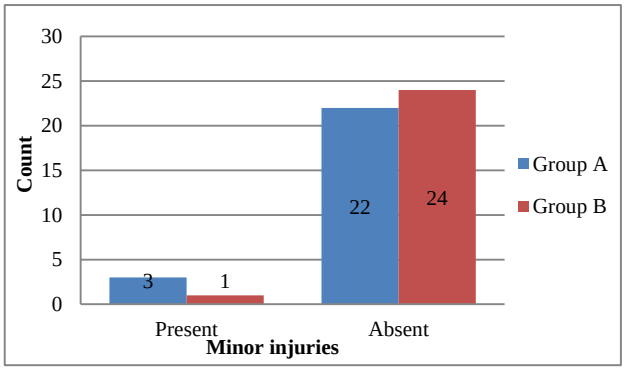

Figure 2: Minor injuries.

The mean blood loss, operative time, minor injuries were similar in both groups (Table 2 and 3) (Figure 2).

On follow up, after 1 month, no postoperative complications in the form of postoperative bleeding, velopharyngeal insufficiency, atlantoaxial dislocation, Eustachian tube scarring, etc. were observed in either group.

In the present study, a subjective 5 point scale was used to grade the degree of symptom relief. In group A, 20 patients were symptom free, 5 patients reported improvement.

In group B, 14 patients were symptom free and 11 patients reported improvement.

DISCUSSION

Adenoidectomy is the most common surgery performed in paediatric age group. Adenoid curette adenoidectomy is a traditional method but having good results. Some disadvantages are damage to torus tubaris, mucosa and eustachian tube orifices.[6]

In our study we compared microdebrider assisted adenoidectomy and Adenoid curette Adenoidectomy. There was a greater incidence of higher grade of residual adenoid tissue post-operatively in Group B as compared to Group A ($p<0.001$). The mean blood loss, operative time, minor injuries were similar in both groups. On follow up, after 1 month, no postoperative complications in the form of postoperative bleeding, velopharyngeal insufficiency, atlantoaxial dislocation, Eustachian tube scarring, etc. were observed in either group.

Stanislaw et al proved that endoscopic assisted powered shaver adenoidectomy is more effective in shaving adenoid tissue under direct visualization; thus requiring less operating time, causing less blood loss, and providing more complete removal of the adenoid tissue.[7] Also in our study, residual tissue present in only 2 cases of microdebrider assisted adenoidectomy and in 23 cases present residual tissue in adenoid curette adenoidectomy which is statistically significant ($p<0.001$).

In another study done by Datta et al, they stated that Endoscopic powered adenoidectomy was found to be a safe and effective tool for adenoidectomy.[8] The study parameters where endoscopic powered adenoidectomy fared better were completeness of resection, accurate resection under vision, lesser collateral damage and faster recovery time. On the other hand, conventional adenoidectomy scored in matter of lesser operative time and intra-operative bleeding**.** Their study also confirms our findings.

In an another study, Costantini done 2 years of routine use of adenoidectomy with a microdebrider and a 70° endoscope, both introduced through the mouth, have demonstrated that the technique is characterized by a high level of precision and a very low incidence of post-operative bleeding.[9] The precision offered by the improved visual field of the endoscope combined with the extreme manageability of the microdebrider allows the surgeon to control the efficient removal of the adenoid tissue, to the great advantage of the patient.

In conclusion, microdebrider assisted adenoidectomy is a safe and effective alternative to curette adenoidectomy, more complete and accurate.

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

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