



Suction cautery adenoidectomy (SCA): Is the additional cost justified?

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ABSTRACT

Objectives: Adenoidectomy is one of the oldest and most frequent ENT procedures. This study aimed to compare adenoidectomy using suction-cautery adenoidectomy (SCA) to curettage with respect to operative time, postoperative complications, and cost-effectiveness.

Methods: The data for this retrospective case control study were retrieved from the Medical Records Department at one of the few medical centers that perform this technique in the Kingdom of Saudi Arabia. The data for each case included the following: patient demographic features, type of procedure, time of operation, occurrence of any postoperative complications, length of hospital stay and cost of the procedure. To minimize the sources of variance in our data, all adenoidectomies were performed by the same consultant otolaryngologist, using either SCA or curettage.

Result: Of the 86 patients who underwent adenoidectomy in this study, SCA was performed in half of them (43) and curettage in the other half. The two groups were well matched with no significant group differences in either age or gender ($p = 0.2$ and $p = 0.19$, respectively). There was a significant reduction in operative time ($p < 0.001$) in the SCA group. There were no cases of postoperative hemorrhage after SCA, but there was one case of hemorrhage in the curette group that required a 2nd surgery to control the bleeding. Regarding cost, there were additional profits of more than 700,000 SR (US\$180,000) each month with SCA as compared to curettage.

Conclusions: The suction cautery technique was superior at reducing operative time, increasing cost-effectiveness and decreasing the risk of postoperative complications. Therefore, we suggest suction cautery as the most appropriate method for adenoidectomy.

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1. Introduction

Adenoids are masses of lymphoid tissue situated in the roof of the nasopharynx, where the nose blends into the mouth. Enlarged adenoids or adenoid hypertrophy can completely block airflow through the nasal passages. Even if enlarged adenoids are not substantial enough to physically block the back of the nose, they can obstruct airflow enough so that breathing through the nose requires an uncomfortable amount of work, and instead, inhalation occurs through an open mouth.

The search for an instrument to successfully perform adenoidectomy under direct vision with a bloodless field has been the topic of numerous clinical trials. These instruments include micro-debridement, laser and suction cautery, in addition to curettage [1,2].

The historical development of the suction cautery technique started in 1970s with the development of the coagulator. Its first experimental use was in the control of gastrointestinal bleeding in dogs. Subsequently, it was used in humans to treat bleeding from active gastric lesions in 6 patients who underwent endoscopic mucosal coagulation [3].

A study published in 2007 [4] that reported on a survey of adenoidectomy and tonsillectomy methods used by the members of the American Society of Pediatric Otolaryngology (ASPO) indicated that SCA was the most common method used for adenoidectomy. This technique has gained popularity as a result of the indirect view achieved using a mirror, and the precise resection that can therefore be achieved while reducing the amount of intraoperative time.

Therefore, it is essential to compare this relatively new method with the established conventional method. To this end, we aimed to determine whether there was a significant difference in operating time and rate of postoperative complications, which are typically hemorrhages, between suction cautery and curettage when adenoidectomy is either done alone or with another procedure. We also sought to determine whether the additional cost of the suction coagulator is justified.

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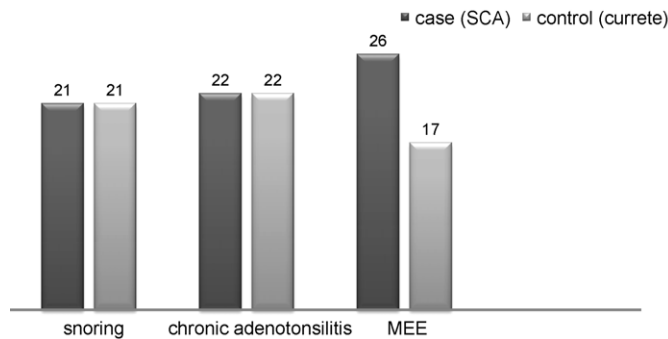


Fig. 1. Clinical presentation among case and control.

2. Materials and methods

This is a retrospective case control study that included patients undergoing adenoidectomy using either SCA (case) or curette (control); all procedures were performed by the same consultant otolaryngologist to prevent any influence on our results of inconsistent surgical technique.

Surgery may have been combined with other procedures, such as tonsillectomy and myringotomy with tube insertion, according to the operative goals of each case. The only exclusion criterion was a surgical history of revision adenoidectomy due to recurrence. The study period was from January 1st, 2005 to December 31st, 2009. Informed consent was obtained from the Medical Records Department at Dr. Suleiman Al Habib Medical Center (SHMC), which is a private center and one of the pioneers of this technique in the Kingdom of Saudi Arabia. The consent process included permission to use the data for research purposes. Data were retrieved from the Medical Records Department at the center and included demographic features of each patient (i.e., age and gender), time of operation, the occurrence of any postoperative complications, the length of hospital stay, the cost and type of the procedure and whether it was done alone or combined with tonsillectomy and/or tube insertion.

Inform consent was obtained from all patients in both groups after detail explanation of the surgery. The procedures were performed under general anesthesia; the patients were positioned supine with a sandbag under their shoulders, and their neck extended. Adenoidectomy was done either by SCA or with a curette.

In SCA technique a red rubber catheter is passed transnasally and used for gentle retraction of the soft palate. A nasopharyngeal mirror is used to visualize the nasopharynx and to guide the

Table 1

Operations performed in conjunction with adenoidectomy.

Operation	Cases	Controls
A alone	2 (4.7%)	8 (18.6%)
A+T	13 (30.2%)	18 (41.9%)
A+G	20 (46.5%)	13 (30.2%)
A+T+G	8 (18.6%)	4 (9.3%)
Total	43 (100.0%)	43 (100.0%)
Chi-square		7.23
p-Value		0.065

Key: A, adenoidectomy; G, myringotomy with tube insertion; T, tonsillectomy.

surgical dissection. While the tip of coagulator is in contact with the adenoidal tissue a current (45 spray) is applied simultaneously with suction. Valley lab E2610-6 Foot switching suction coagulators a division of Tyco Healthcare Group LP 5920 Longbow Drive Boulder, CO 80301-3299, USA was used in each procedure.

Regarding the curette technique adenoids were removed using variable sized adenotomes using similar technique (red rubber catheter and nasopharyngeal mirror).

The procedures were combined with tonsillectomy or tube insertion depending on the case. For adenotonsillectomies patients all the tonsillectomies were performed in a standard way using unipolar diathermy in either group to avoid any impact on the length of the procedure. Both groups had Augmentin (combination of amoxicillin and clavulanate potassium) and all patients were discharged successfully after 4–8 h of observation unless any complications occurred.

3. Results

During the 5 years included in the study, 86 patients who underwent adenoidectomy alone or combined with other procedures were included. Half of the cases (43) were curette adenoidectomies, and half (43) were SCA. Clinical presentations included snoring due to adenoid hypertrophy, recurrent adenotonsillitis and chronic otitis media with effusion (OME) (Fig. 1).

Very few adenoidectomies were performed alone. Tonsillectomy and/or myringotomy with tube insertion were most frequently combined with adenoidectomy (Table 1). The two treatment groups were well matched for age and gender ($p = 0.2$ and $p = 0.19$, respectively) (Fig. 2 and Table 2).

There was one reported case of postoperative hemorrhage in the curette group, and the patient underwent a 2nd surgery to control the bleeding; there were no cases of postoperative hemorrhage in the SCA group.

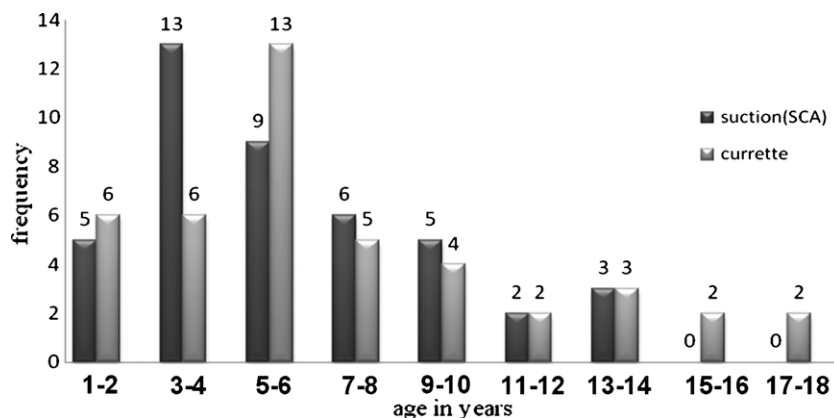


Fig. 2. Age distribution among case and control.

Table 2

Gender distribution among cases and controls.

	Cases	Controls
Male	23 (53.5%)	17 (39.5%)
Female	20 (46.5%)	26 (60.5%)
Total	43 (100.0%)	43 (100.0%)
Chi-square		1.7
p-Value		0.19

Table 3

Mean operative time among cases and controls according to procedure.

Type of procedure	Cases ^a	Controls ^a
A alone	7 ± 2	23 ± 5
A + T	14 ± 3	26 ± 9
A + G	21 ± 8	25 ± 6
A + T + G	21 ± 5	32 ± 5
Total	18 ± 7	26 ± 8

Key: A, adenoidectomy; G, myringotomy with tube insertion; T, tonsillectomy.

^a Data is expressed as mean ± SD, p-value < 0.001.

Duration of procedure was recorded in the OR sheets – according to the surgeon it begin from insertion of Boyle–Davis gag until homeostasis was obtained – showed a wide variation in both groups (Table 3). There was a significant difference in the duration of surgery between suction cautery and curettage adenoidectomy. In general, operative time was significantly shorter for suction cautery than for curette ($p < 0.001$). From the data, there were 20 cases in the suction cautery group in which surgery required 15 min or less compared to only 2 patients in the curette group. The reason for the prolonged curette adenoidectomies was difficulty with homeostasis and visualization, whereas recurrent blocking of the cautery was the main reason for prolonged surgery in SCA.

Regarding length of hospital stay, except for 2 patients in the curette group who were required to remain at the hospital until the next day, all patients were discharged successfully after 6–8 h of observation.

4. Discussion

Adenoidectomy is one of the oldest and most frequent ENT procedures. This procedure is often grouped with either tonsillectomy or myringotomy with tube insertion or both. Its indications are extensive and include obstructive sleep apnea, recurrent otitis media with and without effusion, nasal obstruction and recurrent sinusitis. Previously, suction cautery was used for homeostasis following curettage adenoidectomy [5], whereas more recently, the entire procedure has been performed using this technique, and it has now been accepted as a suitable technique, especially in the pediatric population. The benefit of suction diathermy in reducing intraoperative blood loss and postoperative bleeding has been well documented [6–9]. This benefit was also demonstrated in our study; the complication of postoperative hemorrhage was not encountered in any of the SCA patients. The small difference in procedure time between the two techniques is potentially important when one considers the high frequency with which adenoidectomies, one of the most common surgical procedures, are performed. Wright et al. demonstrated a reduction in operative time for patients who underwent adenoidectomy alone when comparing curette and SCA [10]. Length of SCA has been reported to vary between 5 and 18 min [8]. In this study, the procedure time of adenoidectomy alone or in combination with another procedure was significantly less when using suction cautery ($p < 0.001$). The

results of other studies have demonstrated that procedure time was similar for curette and suction cautery when performing adenoidectomy alone [10]. However, in the literature, operating time has also been shown to vary with the experience of the surgeon [11]. Therefore, the relatively longer suction cautery time in previous studies may be attributable to the surgeon's relative inexperience with the newer procedure.

What is relatively new in this study is the assessment of whether the additional cost of SCA is justified by comparing the benefit of the reduced operative time to the additional cost of the coagulator needed to perform the procedure. We have permission from the hospital to access the data for audit purposes. In general, the cost of adenoidectomy is SR3000 (US\$800) with an additional cost of only SR100 (US\$27) for the coagulator for SCA procedures. The reduction in operative time achieved with the coagulator results in 8 additional SCA adenoidectomies each day. Time is money, and by simple calculation, this reduction in time will produce $8 \times 3100 = 24,800$ SR (US\$6,613) each day and $24,000 \times 30 = 744,000$ SR (US\$198,400) each month. This difference can be explained in part, by the costs at this center, but our goal was to demonstrate the benefit of reducing operative time in small children. Moreover, the difference in operative time is particularly important for physicians considering that this is one of the most common procedures performed worldwide.

Future study may be directed at comparing the pain and long-term outcomes of suction cautery to that of newer adenoidectomy techniques to identify and validate the preferred method for this commonly performed procedure.

5. Conclusion

Suction cautery adenoidectomy is a relatively new technique that is acceptable, safe, rapid and cost-effective. Therefore, we suggest suction cautery as the most appropriate method for adenoidectomy.

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