Original Article

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Coblation Tonsillectomy: A Review of Five-Year Experience in Basrah

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ABSTRACT

Background: Tonsillectomy is a very common surgery in children and it is the most routinely performed surgical operation worldwide. It is indicated for recurrent tonsillitis, chronic tonsillitis, peritonsillar abscess, suspicion of malignant diseases, and tonsillar hypertrophy causing obstructive sleep apnea. Various techniques can be employed for tonsillectomy, including cold dissection, electrocautery, bipolar diathermy dissection, radiofrequency, coblation, laser, and harmonic scalpel. Coblation is one of the most recent techniques used for tonsillectomy, which can ablate tissue by generating a field of ionized sodium molecules using a bipolar radiofrequency energy, which ablates and coagulates soft tissue into an ionized plasma layer, creating sufficient energy to break molecular bonds which result in molecular dissociation. **Aim**: To evaluate the efficacy of the coblation technique in decreasing the complications associated with tonsillectomy. **Methods**: A prospective study was conducted at Al-Moosawi Private Hospital in Basrah over a period of five years, between April 2018 to April 2023. A total of 466 patients (266 male and 240 female), aged 4 to 54 years, were included. All patients underwent coblation tonsillectomy either due to recurrent tonsillitis or tonsillar hypertrophy causing obstructive sleep apnea, or both. Several operative and postoperative parameters were evaluated, including operative time, hospital stay, postoperative bleeding, postoperative pain, and time to resume a normal diet. **Results**: The surgery was most commonly indicated due to recurrent tonsillitis in 411 patients (88%), while only 5 patients (1%) underwent surgery for tonsillar hypertrophy causing obstructive sleep apnea. The operative time ranged from 6 to 15 minutes in the majority of patients, constituting 413 (88.6%). Of the patients, 396 patients (85%) stayed in hospital for 6 hours postoperatively, while 44 patients (9.5%) stayed for 12 hours, and only 26 patients (5.5%) required an overnight stay. Among the 466 patients, only 8 (1.7%) patients experienced postoperative bleeding. The bleeding was primary in 3 (0.65%) and secondary in 5 (1.05%) patients. The mean VAS in the first postoperative day was 2.5±1.4, increasing to 4±1.4 on the third postoperative day, and decreasing to 3.5±1.7 by the 7th postoperative day. Most patients (311, or 66.7%) resumed a normal diet on the first postoperative day, while only 12 (2.5%) delayed resuming their diet to the seventh postoperative day. **Conclusions**: Based on our findings and clinical outcomes, the coblation technique is an effective, reliable, and safe method for tonsillectomy, with negligible complications. We recommend its wider adoption among otolaryngologists and pediatric ENT surgeons.

Keywords: Tonsillectomy, coblation, bleeding, pain, Basrah.

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INTRODUCTION

Tonsillectomy is a very common surgery in children and is the most routinely performed surgical operation worldwide.[1] Tonsillectomy is indicated for recurrent tonsillitis, chronic tonsillitis, peritonsillar abscess, suspicion of malignant diseases, and tonsillar hypertrophy causing obstructive sleep apnea.[2] It can be performed using various techniques, including cold steel dissection, electrocautery, bipolar diathermy dissection, radiofrequency, coblation, laser, and harmonic scalpel.[3] Coblation is one of the most recent techniques employed for tonsillectomy. It ablates tissue by generating a field of ionized sodium molecules through bipolar

radiofrequency energy. This process ablates and coagulates soft tissue into an ionized plasma layer, creating sufficient energy to break molecular bonds, resulting in molecular dissociation.[4] This technique involves the dissection of tonsillar tissue at low temperatures, resulting in less pain and discomfort compared to other techniques.[5] Compared to traditional tonsillectomy techniques, coblation tonsillectomy is believed to offer several potential advantages, including reduced postoperative pain, decreased risk of bleeding, shorter recovery time, and potentially lower risk of complications such as infection.[5] The aim of this study is to evaluate the efficacy of the coblation technique in reducing the complications associated with tonsillectomy.

MATERIALS AND METHODS

The study was conducted at Al-Moosawi Private Hospital from April 2018 to April 2023. A total of 466 patients (226 male and 240 female), aged 4 to 54 years, were included. An additional 265 patients who underwent coblation adenotonsillectomy and coblation uvulopalatoplasty were excluded. All patients underwent coblation tonsillectomy due to recurrent tonsillitis, tonsillar hypertrophy causing obstructive sleep apnea, or both. Patients with a history of peritonsillar abscess or suspicion of tonsillar malignancy were excluded. After thorough history taking and medical examination, pre-operative investigations were performed, including complete blood count, blood group and Rh typing, clotting time, bleeding time, and important virological tests. All operations were performed under general anesthesia with endotracheal intubation by the same surgical team. The tonsil was excised using the ArthroCare ENT Coblator II surgery system with Evac 70 plasma wands. The wand comprises five active electrodes located at the distal end of the tip, with the exposed portion of the shaft acting as the return electrode just proximal to the active electrodes. The settings were standardized at seven for coblation and three for coagulation. Several operative and postoperative parameters were evaluated, including:

1. Operative time: Measured in minutes to estimate the time required to complete the surgery.
2. Hospital stay: Assessed at 6 hours, 12 hours, and overnight stay.
3. Postoperative bleeding: Divided into primary bleeding, defined as any tonsillar bleeding occurring within the first 24 hours postoperatively, and secondary bleeding, defined as any bleeding occurring after the first postoperative 24 hours.
4. Postoperative pain: Assessed using the Visual Analog Scale (VAS), where a score of 1 indicates “no pain”, while a score of 10 indicates “maximal pain.”
5. Resumption of a normal diet: Assessed daily for the first week.

Data were analyzed using the Statistical Package for Social Sciences (SPSS) software program (version 22). A p-value of equal to or less than 0.05 was considered significant.

RESULTS

The most common age group studied was 10-14 years, with 128 (27.2%) patients, followed by the 5-9 years age group with 80 patients (17.3%). The least common age group was 35-39 years, with 17 patients (3.9%). The study included 226 males (49.5%) and 240 females (51.5%), resulting in a male-to-female ratio of approximately 0.94:1 (Table 1).

The surgery was most commonly indicated due to recurrent tonsillitis in 411 patients (88%), while only 5 patients (1%) underwent surgery for tonsillar hypertrophy causing obstructive sleep apnea. The remaining 11% of patients were indicated for both infectious and obstructive symptoms (Figure 1)

The operative time ranged from 6 to 15 minutes in the majority of patients, constituting 413 (88.6%). Specifically, the operative time was 9-12 minutes for 171 (36.6%) patients, 6-9 minutes for 129 (27.7%) patients, and 12-15 minutes for 113 (24.3%) patients (Table 2).

Of the patients, 396 (85%) stayed in the hospital for 6 hours postoperatively, while 44 patients (9.5%) stayed for 12 hours, and only 26 patients (5.5%) stayed in the hospital for an overnight stay (Table 3).

Among the 466 patients, only 8 (1.7%) experienced postoperative bleeding, with primary bleeding occurring in 3 (0.65%) and secondary bleeding in 5 (1.05%) patients (Table 4). Of these, 5 (62.5%) patients were treated conservatively, while 3 (37.5%) required surgical intervention (Table 5).

The mean Visual Analog Scale (VAS) score on the first postoperative day was 2.5±1.4, increasing to 4±1.4 on the third postoperative day, and decreasing to 3.5±1.7 by the seventh postoperative day.

Most of patient started ordinary diet on the first postoperative day, while only 12 (2.5%) delayed resuming their diet until the 7th postoperative day.

Table 1: Age and sex distribution

Age Group (year)	Males No. (%)	Females No. (%)	Total No. (%)
5-9	34 (7.5%)	46 (9.8%)	80 (17.3%)
10-14	59 (12.7%)	69 (14.5%)	128 (27.2%)
15-19	22 (4.8%)	26 (5.6%)	48 (10.4%)
20-24	36 (7.9%)	34 (7.5%)	70 (15.4%)
25-29	17 (3.9%)	13 (2.8%)	30 (6.7%)
30-34	27 (5.8%)	19 (4%)	46 (9.8%)
35-39	6 (1.3%)	11 (2.6%)	17 (3.9%)
40-44	11 (2.6%)	15 (3.1%)	26 (5.7%)
45-49	14 (3%)	7 (1.6%)	21 (4.6%)
Total	226 (49.5%)	240 (51.5%)	466 (100%)

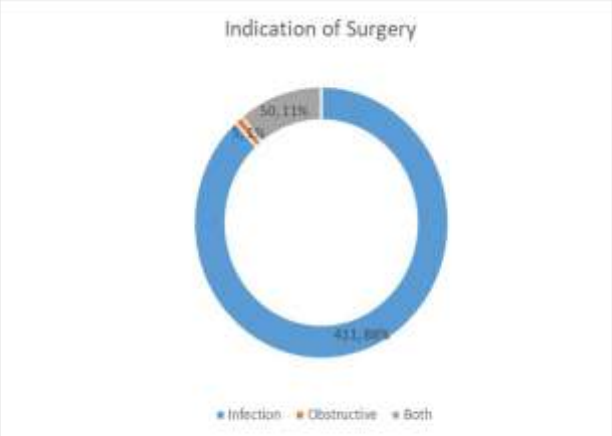

Figure 1: Distribution of Indications for Surgery (Infective, Obstructive and Both)

Table 2: Operative Time

Operative Time (Minute)	1st Year of Study	2nd Year of Study	3rd Year of Study	4th Year of Study	5th Year of Study	Total Patients No. (%)
6-9	0	3	27	33	66	129 (27.7%)
9-12	0	39	48	47	37	171 (36.6%)
12-15	36	21	23	18	15	113 (24.3%)
15-18	10	12	6	3	1	32 (6.9%)
18-21	4	2	2	1	0	9 (1.9%)
21-24	3	1	0	0	0	4 (0.9%)
24-27	3	2	0	0	0	5 (1%)
27-29	2	1	0	0	0	3 (0.7%)
Total	58	81	106	102	119	466

Table 3: Hospital stay

Age Group (Year)	6 Hours	12 Hours	Overnight	Total
5-9	33(7%)	29(6.2%)	18(3.7%)	80(16.9%)
10-14	121 (26%)	4(0.85%)	3(0.7%)	128(27.55%)
15-19	47(10%)	1(0.2%)	0	48(10.2%)
20-24	69 (14.9%)	1(0.2%)	0	70(15.1%)
25-29	30 (6.5%)	0	0	30(6.5%)
30-34	46 (9.9%)	0	0	46(9.9%)
35-39	16 (3.4%)	1(0.2%)	0	17(3.6%)
40-44	21 (4.5%)	3 (0.7%)	2(0.4%)	26(5.6%)
45-49	13 (2.8%)	5(1.15%)	3(0.7%)	21(4.65%)

Table 4: Postoperative bleeding

Age Group (year)	Primary	Secondary	Total
5-9	1	1	2
10-14	1	0	1
15-19	0	0	0
20-24	0	0	0
25-29	0	1	1
30-34	0	0	0
35-39	0	0	0
40-44	0	1	1
45-49	1	2	3
Total	3	5	8

Table 5: Postoperative bleeding consequences

Postoperative bleeding consequences	Primary	Secondary	Total
Re-surgery	2	1	3
Conservative	1	4	5
Total	3	5	8

Table 6: Postoperative pain scale (VAS)

DAY	Mean VAS	SD
Day 1	2.5	1.4
Day 3	4	1.4
Day 7	3.5	1.7

Table 7: Postoperative ordinary diet

Postoperative day	Patients No. (%)
Day 1	311 (66.7%)
Day 2	63 (13.5%)
Day 3	34 (7.3%)
Day 4	15 (3.2%)
Day 5	21 (4.6%)
Day 6	10 (2.2%)
Day 7	12 (2.5%)
Total	466

DISCUSSION

The coblation technique is one of the recent methods used for tonsillectomy. It is suggested that coblation tonsillectomy has fewer complications compared to traditional methods. This study aimed to evaluate the efficacy of coblation tonsillectomy by assessing various parameters. We found that the operative time ranged from 6-15 minutes for the majority of patients (88.6%). This finding is comparable to the study by MA Matin et al.[6] which reported an operative time ranging from 10-25 min (mean 12 minutes). However, it was longer than the study by Sermed Ebdollatif Tahyr and Moyaser Abdul-Rahman Yaseen.[7] which reported an operative time ranging from 1.35-7.50 minutes (mean 3.38 minutes). In contrast, the study by Santosh Kumar Swain et al.[8] reported a longer operative time with a mean of 24.2 ± 3 minutes. Most patients (85%) stayed in the hospital for 6 hours postoperatively, while only 26 patients (5.5%) required an overnight stay. In the study by Abdelmaksoud et al.[9] nearly half of the procedures were conducted as day cases (44%), with only a small proportion staying in the hospital for more than one night (7%). Postoperative hospital stay was reported as 2.5 days in the study by KS Santosh et al.[8] We found that only 8 (1.7%) experienced postoperative bleeding, with primary bleeding occurring in 3 (0.65%) of these patients, while it was secondary bleeding in 5 (1.05%) patients. This rate was slightly higher than that reported by MA Matin et al.[6] who stated that there was no reactionary or secondary hemorrhage in the coblation group. Our results were comparable to those of Powell S et al.[10] who reported that 1.2% of patients were readmitted with bleeding, and 0.2% required a return to the operating room for control of secondary hemorrhage. Mostafa El-Taher and Zaki Aref found that primary hemorrhage occurred in 0.2% of patients, while secondary hemorrhage occurred in 1.2%, which is similar to our findings.[11] The mean VAS score on the 1st postoperative day was 2.5±1.4, while it was 3.5±1.7 on the 7th postoperative day. Our results differ from those of Sermed E T, Moyaser A Y.[8] who reported a mean VAS of 1.73 ± 1.144 on the first postoperative day and 0.61 ± 1.05 at 7th postoperative day. MA Matin et al. found that the mean VAS was mild to moderate in the first 24-48 hours, with no pain reported by the 8th postoperative day. Most patients (311, or 66.7%) resumed a normal diet on the first postoperative day, with only (2.5%) of patients had a delay in starting ordinary diet until the 7th postoperative day. This contrasts with the findings of Mostafa El-Taher and Zaki Aref, who reported a postoperative diet intake of 5.00 ± 1.41 days.

CONCLUSIONS

Based on our findings and clinical outcomes, the coblation technique for tonsillectomy is an effective, reliable, and safe procedure with negligible complications. We recommend its wider adoption among otolaryngologists and pediatric ENT surgeons.

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