Coblator™ vs. Microdebrider in Pediatric Intracapsular Tonsillotomy: A Comparison of Efficiency, Bleeding, and Revision Rates

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Introduction

Intracapsular tonsillectomy or "tonsillotomy" is an increasingly popular alternative to extracapsular tonsillectomy due to decreased bleeding risk and pain. The Coblator™ and microdebrider are most frequently used, but studies comparing these instruments are limited. Our study aimed to compare postoperative bleed rates, efficiency, and revision rates between these instruments.

Methods and Materials

A retrospective review was conducted on pediatric patients undergoing tonsillotomy with adenoidectomy using either the microdebrider (12 surgeons) or Coblator™ (3 surgeons) at a quaternary children's hospital from 2018-2024. Patients were included if they had a history of tonsillotomy with or without adenoidectomy for an obstructive condition. Logistic regression models were used to identify independent factors associated with postoperative bleeding and revision rates.

Microdebrider Tonsillotomy Technique

Microdebrider tonsillotomy was performed by removing tonsillar tissue down to the capsule while also preserving the anterior and posterior tonsillar pillars followed by suction cautery on a setting of 20-30 watts for hemostasis. In cases where the microdebrider was used for tonsillotomy the adenoidectomy was performed using the microdebrider followed by suction diathermy.
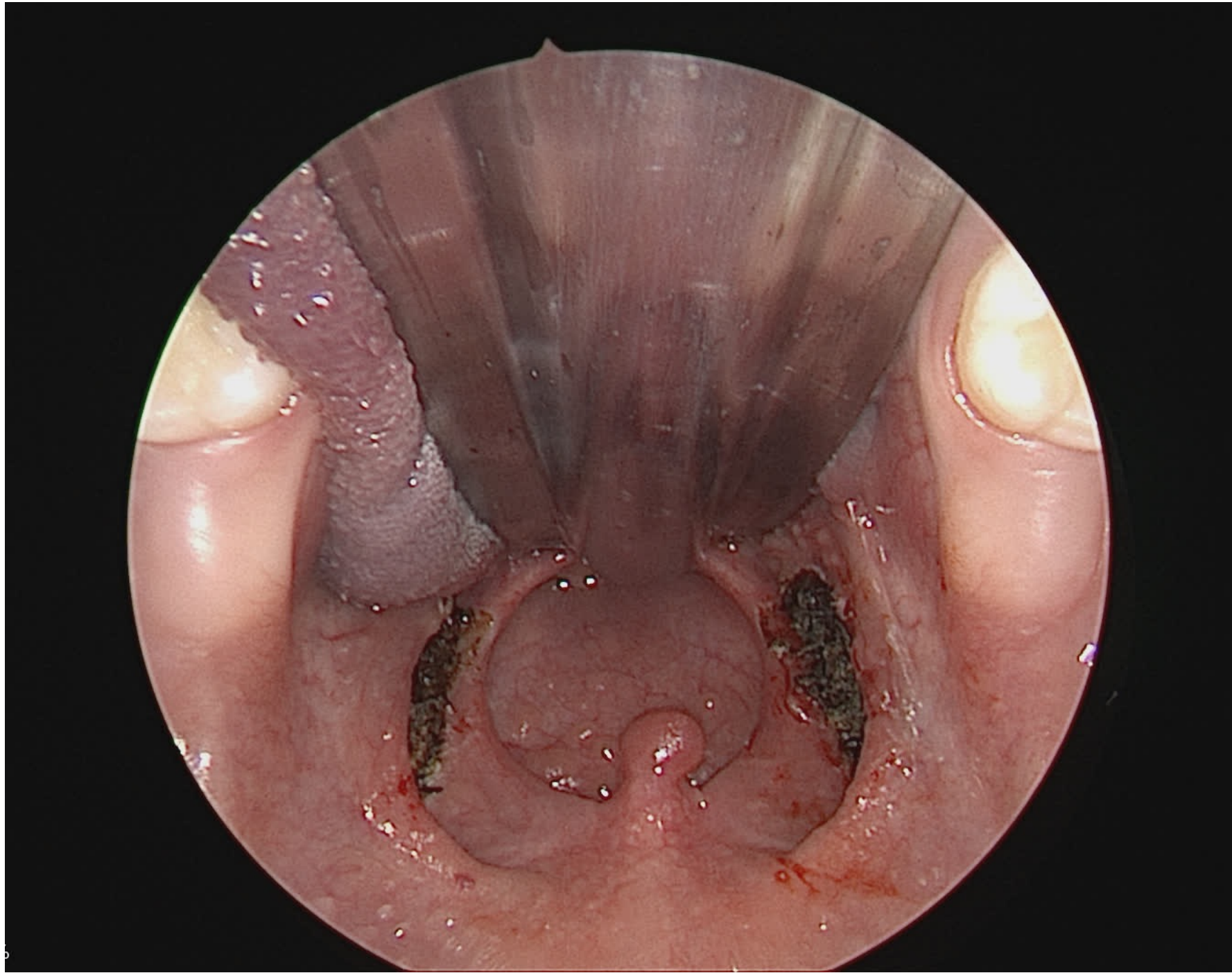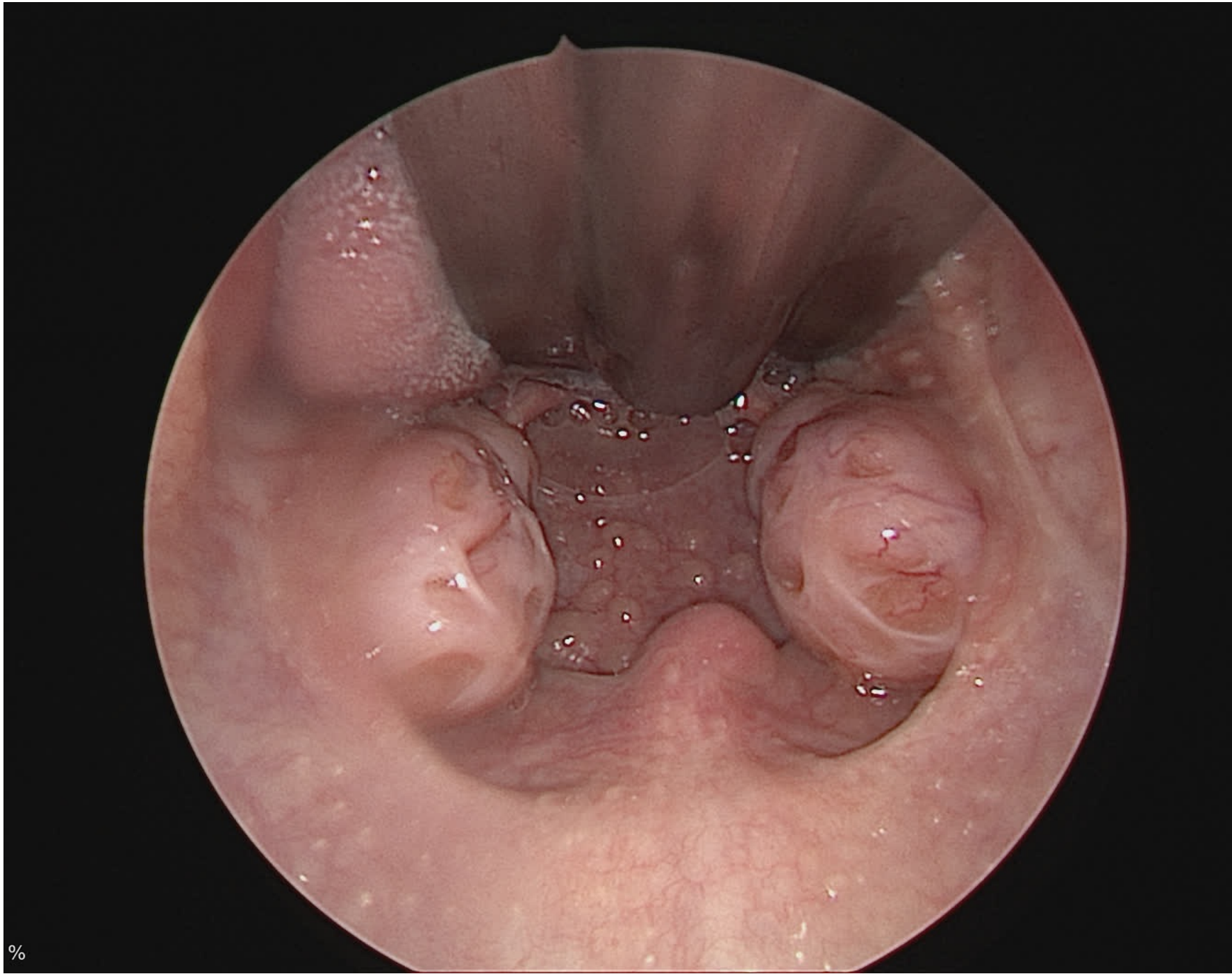
Coblator™ Tonsillotomy Technique

Coblator™ tonsillotomy was performed using the Coblator™ Procise MAX wand. Hypertrophic tonsillar tissue was removed while leaving a thin layer over the capsule, with anterior and posterior tonsillar pillars left intact. Bleeding was controlled using the Coblator™ coagulation setting. In cases where the Coblator™ was used for tonsillotomy, the adenoidectomy was subsequently performed using suction diathermy.
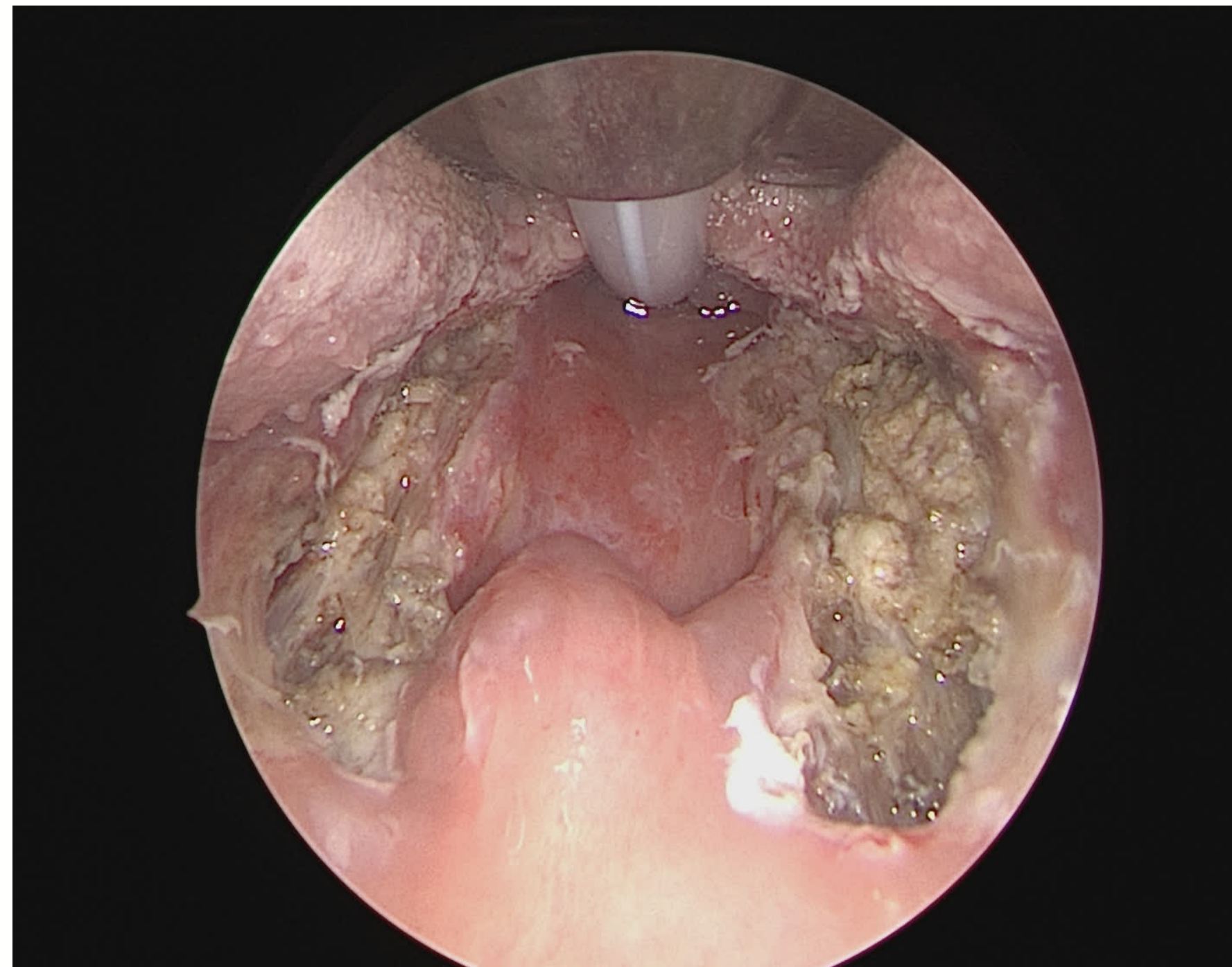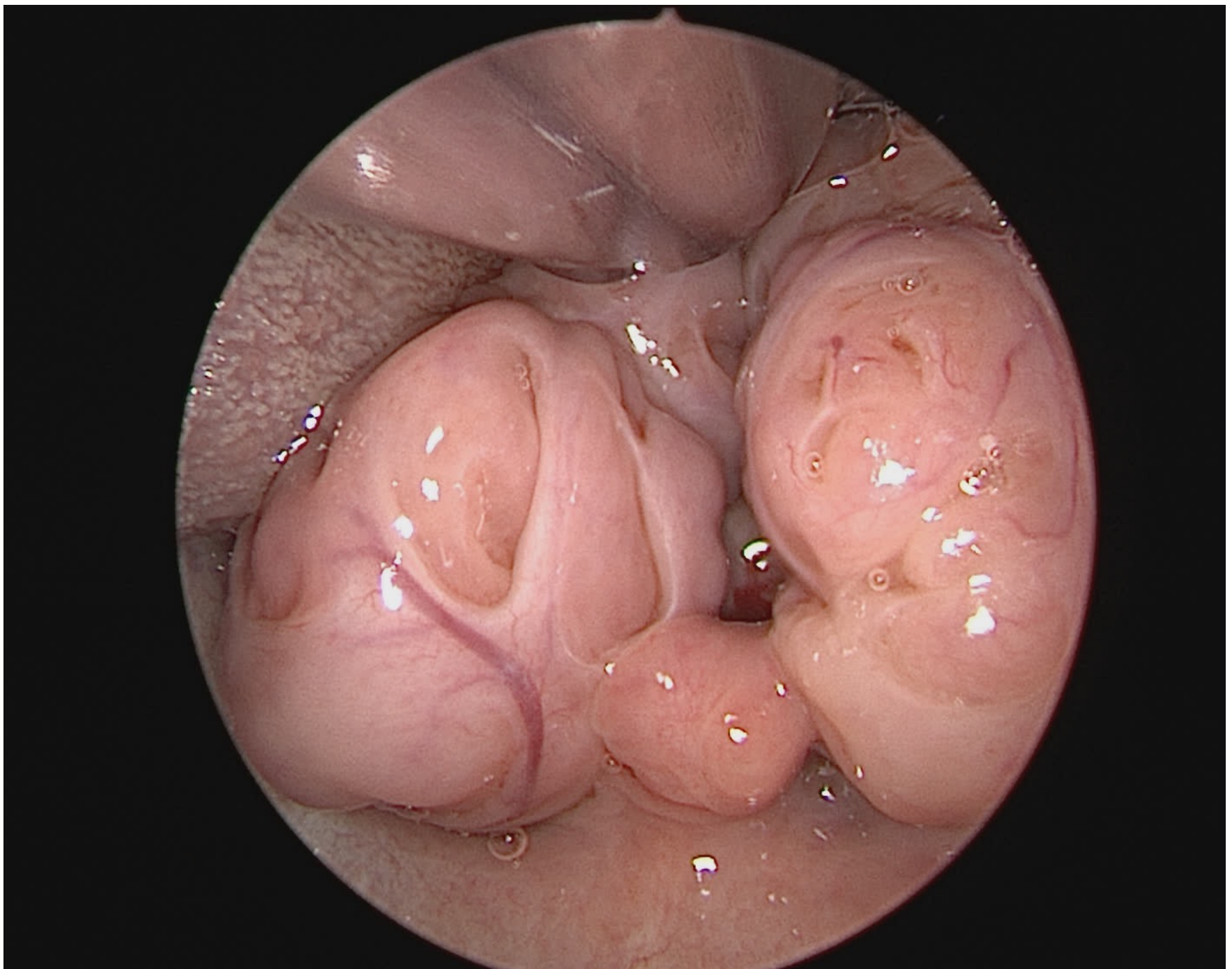
Results

Table 1. Patient characteristics*

Characteristics	Total	Coblator group	Microdebrider group	p-value
N	1734	385	1349	
Age at surgery, years				
Mean (SD)	4.95 (2.21)	5.42 (2.24)	4.81 (2.18)	<0.001
Range	1.11 to 13.00	1.42 to 12.45	1.11 to 13.00	
Gender				
Female	785 (45.3%)	196 (50.9%)	589 (43.7%)	0.012
Male	948 (54.7%)	189 (49.1%)	759 (56.3%)	
Main hospital and satellite site surgery time, min**				
N	1112	258	854	
Mean (SD)	29.10 (13.04)	28.11 (12.79)	29.40 (13.10)	0.007
Median (IQR)	26.00 (21.50, 33.50)	25.00 (21.00, 36.00)	27.00 (24.00, 38.00)	
Satellite site surgery time, min				
N	647	157	490	
Mean (SD)	24.34 (6.40)	22.62 (6.35)	24.89 (6.33)	<0.001
Median (IQR)	24.00 (20.00, 28.00)	22.00 (18.00, 26.00)	24.00 (20.00, 29.00)	
Surgical site				
Main hospital	755 (43.5%)	153 (39.7%)	602 (44.6%)	0.088
Satellite	979 (56.5%)	232 (60.3%)	747 (55.4%)	
Bleeding disorder				
Yes	29 (1.7%)	5 (1.3%)	24 (1.8%)	0.517
Tonsil bleed cauterization				
Yes	16 (0.9%)	4 (1.0%)	12 (0.9%)	0.765
Underwent revision surgery				
Yes	15 (0.9%)	2 (0.5%)	13 (1.0%)	0.544

Abbreviations: SD = standard deviation
*Wilcoxon rank sum test was used for continuous variable and fisher's exact test or Chi-square test was used for categorical variables.
**Surgery time was calculated only for cases of tonsillotomy and adenoidectomy

Table 2. Factors associated with post-op bleeding*

Factors	Total	Post-op bleeding	No post-op bleeding	Unadjusted OR (95% CI)	p-value	Adjusted OR (95% CI)	p-value
N	1734	16	1718				
Age at surgery, years							
Mean (SD)	4.95 (2.21)	5.94 (2.60)	4.94 (2.20)	1.19 (0.98, 1.44)	0.072	1.19 (0.98, 1.43)	0.084
Range	1.11 to 12.997	2.69 to 11.75	1.11 to 12.997				
Instrument							
Microdebrider	1349	12 (0.9%)	1337 (99.1%)	Reference	-	Reference	-
Coblator	385	4 (1.0%)	381 (99.0%)	1.17 (0.38, 3.65)	0.787	1.1 (0.35, 3.47)	0.876
Gender							
Female	785	7 (0.9%)	778 (99.1%)	Reference	-	Reference	-
Male	948	9 (0.9%)	939 (99.1%)	1.07 (0.39, 2.87)	0.901	1.18 (0.43, 3.23)	0.744
Bleeding disorder							
No	1705	14 (0.8%)	1691 (99.2%)	Reference	-	Reference	-
Yes	29	2 (6.9%)	27 (93.1%)	8.95 (1.94, 41.30)	**0.005**	8.73 (1.86, 40.92)	**0.006**
Surgical Site							
Satellite	979	9 (0.9%)	970 (99.1%)	Reference	-	-	-
Main hospital	755	7 (0.9%)	748 (99.1%)	1.01 (0.37, 2.72)	0.986	-	-

Abbreviations: CI = confidence interval; OR = odds ratio; SD = standard deviation
*Logistic regression was used. For the variables with the small number of events, the firth adjusted method was applied.

Table 3. Factors associated with revision*

Factors	Total	Revision	No revision	Unadjusted OR (95% CI)	p-value	Adjusted OR (95% CI)	p-value
N	1734	15	1719				
Age at surgery, years							
Mean (SD)	4.95 (2.21)	3.33 (1.24)	4.96 (2.21)	0.57 (0.38, 0.84)	**0.005**	0.59 (0.41, 0.85)	**0.004**
Range	1.11 to 12.997	1.31 to 5.47	1.11 to 12.997				
Instrument							
Microdebrider	1349	13 (1.0%)	1336 (99.0%)	Reference	-	Reference	-
Coblator	385	2 (0.5%)	383 (99.5%)	0.54 (0.12, 2.39)	0.414	0.85 (0.23, 3.15)	0.808
Gender							
Female	785	6 (0.8%)	779 (99.2%)	Reference	-	Reference	-
Male	948	9 (0.9%)	939 (99.1%)	1.24 (0.44, 3.51)	0.680	1.08 (0.41, 2.84)	0.874
Bleeding disorder							
No	1705	15 (0.9%)	1690 (99.1%)	Reference	-	Reference	-
Yes	29	0 (0.0%)	29 (100.0%)	1.85 (0.10, 33.2)	0.677	1.73 (0.10, 29.2)	0.705
Surgical Site							
Satellite	979	6 (0.6%)	973 (99.4%)	Reference	-	-	-
Main hospital	755	9 (1.2%)	746 (98.8%)	1.96 (0.69, 5.52)	0.205	-	-

Abbreviations: CI = confidence interval; OR = odds ratio; SD = standard deviation
*Logistic regression was used. For the variables with the small number of events, the Firth adjusted method was applied.

Conclusion

We found no difference in postoperative hemorrhage or revision between the Coblator™ and microdebrider groups. The Coblator™ technique was more time efficient which could ultimately allow surgeons to increase their operative volume over the course of a day. Future directions for this study include a cost-analysis between the Coblator™ and microdebrider as well as evaluating differences in postoperative pain and return to normal activity.

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