

Survey of Short-term Patient Satisfaction after Surgery for Obstructive Sleep Apnea

Han-Ren Hsiao, MD; Pa-Chun Wang^{1,2,3}, MD, MSc; Wen-Nuan Cheng⁴, MHS; Li-Ang Lee, MD; Ning-Hung Chen⁵, MD; Tuan-Jen Fang, MD; Hsueh-Yu Li⁶, MD

Background: To investigate the level of satisfaction of patients who received surgery for obstructive sleep apnea (OSA).

Methods: A patient satisfaction survey (PSS) was administered three months after surgery to 76 patients who received either a uvulopalatopharyngoplasty (UPPP) alone, or in combination with a septomeatoplasty (SMP), or a mid-line laser glossectomy (MLG). Patient satisfaction determinants were also explored.

Results: In general, 93.4% of patients rated their overall satisfaction as “excellent” or “very good”. High satisfaction levels (excellent + very good $\geq 90\%$) were observed in the dimensions of “professional skill”, “personal manner”, and “explanation of condition”. By contrast, lower satisfaction levels (excellent + very good $< 90\%$) were observed for “perioperative discomfort”. There were no significant differences among the UPPP alone, UPPP + SMP, and UPPP + MLG groups for any dimension of satisfaction ($p > 0.05$). Older patients had decreased overall levels of satisfaction (adjust $R^2 = 0.1$, $p = 0.02$).

Conclusions: The preliminary results reveal a high overall level of satisfaction after surgery for OSA in this short-term survey. However, modest satisfaction with perioperative discomfort was also noted. Combined nasal or tongue base surgeries can be performed with patient satisfaction comparative to that of UPPP alone. Age may confound satisfaction levels in patients receiving OSA surgery.

(*Chang Gung Med J* 2009;32:212-9)

Key words: patient satisfaction, obstructive sleep apnea, uvulopalatopharyngoplasty, septomeatoplasty, midline laser glossectomy

Obstructive sleep apnea (OSA) is characterized by episodes of complete or partial pharyngeal obstruction during sleep.⁽¹⁾ Studies have revealed that patients with OSA have an increased incidence of cardiovascular disease and treatment of OSA appears to reduce these complications.^(2,3)

Among various treatment modalities for OSA, nasal continuous positive airway pressure (CPAP) is the preferred treatment with the firmest evidence base.⁽⁴⁾ However, numerous patients are intolerant or unwilling to use long-term nasal CPAP and, therefore, seek surgical treatment to relieve OSA-related

From the Department of Otolaryngology; ⁵Department of Pulmonary and Critical Care Medicine, Sleep Center, Chang Gung Memorial Hospital, Taipei, Chang Gung University College of Medicine, Taoyuan, Taiwan; ¹Department of Otolaryngology, Cathay General Hospital, Taipei, Taiwan; ²School of Medicine, Fu Jen Catholic University, Taipei, Taiwan; ³School of Public Health, China Medical University, Taichung, Taiwan; ⁴Department of Sport Management, Taipei Physical Education College, Taipei, Taiwan; ⁶Department of Nursing, Chang Gung Institute of Technology, Taoyuan, Taiwan.

Received: Nov. 16, 2007; Accepted: May 13, 2008

Correspondence to: Dr. Hsueh-Yu Li, Department of Otolaryngology, Chang Gung Memorial Hospital, No. 5, Fusing St., Gueishan Township, Taoyuan County 333, Taiwan (R.O.C.) Tel.: 886-3-3281200 ext. 3967; Fax: 886-3-3979361; E-mail: hyl38@cgmh.org.tw

symptoms. Uvulopalatopharyngoplasty (UPPP), introduced by Fujita et al, is the most commonly utilized single surgical procedure for OSA.⁽⁵⁾ However, the poor success rate of traditional UPPP has led to a variety of modifications in surgical procedures and combination with other surgeries to enhance multi-level airspace to increase the success rate.⁽⁶⁻⁸⁾

The assessment of outcome for OSA surgery could be subjective or objective. A reduction in the apnea/hypopnea index (AHI) on a polysomnographic test is generally considered the principal outcome and is used to determine the success or failure of OSA surgery.⁽⁹⁾ Nevertheless, patient satisfaction should be another concern. Satisfaction is a subjective feeling about fulfillment of wishes. Patient satisfaction commonly refers to how well the patient's expectations about the service of medical care have been met.⁽¹⁰⁾ Patient satisfaction surveys have been used in investigating medical service and quality in outpatient surgery and endoscopic sinus surgery.^(11,12) However, to our knowledge, surveys of OSA surgery have rarely been reported in the literature.

Using a dimension-specific patient satisfaction survey, the aims of this study are to investigate patient satisfaction levels after OSA surgery and to compare the satisfaction levels among different surgical groups (UPPP alone, UPPP with nasal surgery, and UPPP with tongue base surgery). We also explore the patient characteristics that may affect the level of satisfaction with OSA surgery.

METHODS

Study population

This research was conducted in a prospective manner at a tertiary referral sleep center. Seventy-six consecutive patients with significant symptoms of snoring and/or daytime sleepiness and OSA (AHI > 5 hr/event) were enrolled in this study. Patients underwent polysomnography in the sleep laboratory, and an otolaryngologic examination, including oropharyngeal inspection and fiberoptic nasopharyngoscopy, was performed during the initial visit. All patients had failure of attempts at conservative measures such as change in sleep posture and sleep hygiene, and documented failure or unwillingness to have a trial of CPAP. Types of surgeries (UPPP alone, UPPP with nasal surgery, and UPPP with tongue base surgery) were chosen at the discretion of

a single surgeon (HYL) based on the Friedman stage and fiberoptic nasopharyngoscopic findings to identify the obstruction level(s).⁽¹³⁾

Patients with a history of cardio-pulmonary disease (coronary artery disease, chronic obstructive pulmonary disease or asthma), swallowing disorders, age > 60 years or pathological obesity (BMI > 40) were excluded from this study.

A detailed explanation of this study, including surgical procedures, complications, outcomes, alternatives and further management, was provided, and informed written consent for individual surgery was obtained from each patient. The study was approved by the institutional review board of Chang Gung Memorial Hospital.

Sleep study

Overnight polysomnography (Nicolet UltraSom System, Madison, Wisconsin, U.S.A.) was performed in the usual manner to document sleep parameters and architecture for every patient at baseline and at least 6 months after completion of surgery. The parameter used in this study was the AHI. The AHI is defined as the number of total apnea and hypopnea episodes per hour of sleep. An apnea episode is defined as cessation of airflow lasting longer than 10 seconds, whereas a hypopnea episode is defined as a 30% or greater reduction in air flow and at least a 4% decrease in oxygen saturation.

Surgical technique

Surgeries were all performed under general anesthesia. No tracheostomy was used. The UPPP operation was performed first. An extended uvulopalatal flap, which was modified from the traditional UPPP, was performed in this study cohort. The detailed procedures for an extended uvulopalatal flap have been published elsewhere.⁽⁶⁾

A nasal surgery-septoplasty (SMP) was concomitantly implemented following UPPP. The procedures include resection of the bowed septum (septoplasty) and excision of the lateral part of the inferior turbinate with out-fracturing (turbino-plasty).⁽⁷⁾ A tongue base surgery-midline laser glossectomy (MLG) was also performed following UPPP. The tongue was pulled out as much as possible. A CO₂ laser (Sharplan Laser Ltd., Tel Aviv, Israel), delivered through a handpiece, was used to remove midline tongue base tissue.⁽⁸⁾

Postoperative care

For every patient, a single dose of intravenous dexamethasone (10 mg) was given immediately before the termination of surgery to prevent postoperative airway edema. Intravenous ampicillin e (500 mg) and ketololac (30 mg) were given every 6 hours for 3 days. Humidified oxygen was supplied to maintain oxygen saturation and to reduce postoperative throat discomfort during sleep. Patients with an AHI ≥ 30 and those who received UPPP + MLG surgery were under continuous oximeter monitoring postoperatively. Nasal packing was removed one day after nasal surgery.

Patient satisfaction survey (PSS)

The PSS, which was derived from Rubin and Ware's model, was designed specifically to measure the satisfaction level of surgical patients by surveying 6 dimensions of service including an overall evaluation, discomfort during the operation, postoperative discomfort, professional skill of the caregiver, personal manner of the hospital staff, and explanation of condition by the caregiver.^(14,15) The PSS was administered three months after surgery at the completion of wound healing to decrease bias from links between the caregiver (doctor) and the care-receiver (patient). Patients rated each dimension on a five-point Likert-type scale with responses of excellent, very good, good, fair, or poor. Item scores of the PSS were normalized and transformed into a scale ranging from 0 (lowest satisfaction) to 100 (highest satisfaction). The PSS was in traditional Chinese format and was validated before use.

Data collection and statistical analysis

Patient characteristics (age, gender, body mass index, marital status, education, income, baseline AHI and type of surgery) were collected at entry. Satisfaction levels among patients with UPPP alone, UPPPP + SMP, and UPPP + MLG were compared using the independent Kruskal-Wallis test. Distributions of satisfaction levels and other categorical variables were compared using the non-parametric χ^2 (Fisher's exact) test among different groups.

Multiple regression models were applied using patient satisfaction levels (0-100) as dependent variables against independent variables (such as patient characteristics) to analyze factors that affected patient satisfaction.

Statistical analyses were performed using SPSS11.0 for Windows (SPSS Inc., Chicago, IL, U.S.A.). A *p* value of less than 0.05 was considered significant.

RESULTS

Patient characteristics and surgical data

Most patients were middle-aged, married (73.7%), and obese (mean BMI, 26.5) men with incomes ranging from 1,501 to 3,000 USD/month (44.7%), and were college-educated (school years ≥ 13 , 65.8%). Patient information is presented in Table 1.

Analytical results revealed that the patient characteristics were indistinguishable among surgery groups (*p* > 0.05) (Table 2). Body mass index remained unchanged 3 months after the operation (26.4 ± 2.8 vs 26.3 ± 2.9 kg/m², *p* = 0.90). The AHI decreased significantly from 38.4 ± 25.1 to 12.6 ± 18.3 /hr, *p* < 0.001.

Patient satisfaction data

The results of the PSS showed that most patients were quite satisfied with the services. The distribution of satisfaction levels, except for postoperative discomfort, were skewed to the positive side (Fig. 1). In general, 93.4% of patients rated the "overall" satisfaction as excellent or very good. Satisfaction levels for the dimensions of "personal manner" "explanation of condition" and "professional skill" were over 90% (excellent + very good). "Discomfort during operation" and "post-operative discomfort" were rated high by only 73.7% and 53.9%, respectively (Table 2). The mean scores for the dimensions were indistinguishable among surgery groups (*p* > 0.05) (Table 3). The 3 surgery groups showed similar levels of "overall" satisfaction (*p* = 0.175).

Satisfaction confounders

All independent variables (age, sex, BMI, baseline AHI, education, income, operation type) were entered into multi-level regression models to determine whether they were predictive of patient satisfaction levels. The results of analysis show that age was the factor most relevant to the satisfaction level; increased age was accompanied by decreasing satisfaction levels for "overall", "discomfort during operation", "personal manner", and "explanation of con-

Table 1. Patient Information

	Total (N = 76)	UPPP (N = 17)	UPPP + SMP (N = 32)	UPPP + MLG (N = 27)	<i>p</i> value
Age (years)*	40.2 ± 9.6	40.1 ± 10.4	38.4 ± 9.1	42.4 ± 9.6	0.269
AHI (events/hr)*	38.4 ± 25.1	36.1 ± 28.9	36.5 ± 23.7	42.1 ± 24.8	0.482
BMI (kg/ m ²)*	26.4 ± 2.8	26.9 ± 3.4	26.5 ± 2.0	26.1 ± 3.2	0.708
Gender M:F†	65:11	11:6	15:1	8:1	0.019
Marital Status†					0.022
Single	15 (19.7%)	1 (5.8%)	11 (34.4%)	3 (11.1%)	
Married	56 (73.7%)	14 (82.4%)	21 (65.6%)	21 (77.8%)	
Divorced/Widowed	5 (6.6%)	2 (11.8%)	0 (0%)	3 (11.1%)	
Education (years)†					0.192
≤ 12	26 (34.2%)	5 (29.4%)	10 (31.2%)	11 (40.7%)	
13-16	41 (53.9%)	11 (64.7%)	20 (62.5%)	10 (37.1%)	
17 or more	9 (11.9%)	1 (5.9%)	2 (6.3%)	6 (22.2%)	
Income (\$USD/mo)†					0.582
< 1500	16 (21.1%)	4 (23.5%)	8 (25%)	4 (14.8%)	
1501-3000	34 (44.7%)	6 (35.3%)	17 (53.1%)	11 (40.8%)	
3001-6000	17 (22.3%)	4 (23.5%)	5 (15.6%)	8 (29.6%)	
> 6001	9 (11.9%)	3 (17.7%)	2 (6.3%)	4 (14.8%)	

Abbreviations: UPPP: uvulopalatopharyngoplasty; SMP: septomeatoplasty; MLG: midline laser glossectomy; AHI: apnea/hypopnea index; BMI: body mass index USD: US dollars; *: Kruskal-Wallis test comparing UPPP, UPPP + SMP, and UPPP + MLG; †: Fisher's exact test comparing UPPP, UPPP + SMP, and UPPP + MLG.

Table 2. Distribution of Patient Ratings in Specific Dimensions of the Patient Satisfaction Survey (number, %)

Dimension	Excellent	Very good	Good	Fair	Poor
Overall	43 (56.6)	28 (36.8)	5 (6.6)	0	0
Discomfort during operation	32 (42.1)	24 (31.6)	17 (22.4)	2 (2.6)	1 (1.3)
Post-operative discomfort	14 (18.4)	27 (35.5)	21 (27.6)	13 (17.2)	1 (1.3)
Professional skill	53 (69.8)	21 (27.6)	2 (2.6)	0	0
Personal manner	48 (63.2)	24 (31.6)	4 (5.2)	0	0
Explanation of condition	50 (65.8)	19 (25.0)	7 (9.2)	0	0

dition". Significant confounders are shown in Table 4.

DISCUSSION

Patient satisfaction is an important feature in modern quality of care but is rarely used in assessing OSA surgery. This study revealed that OSA patients have high overall satisfaction levels with caregivers

after surgery. No significant differences were noted in satisfaction levels among patients having UPPP alone and those with combined surgeries. Increased age may decrease satisfaction levels.

Quality of care is greatly emphasized in today's patient-centered health care environment.⁽¹⁶⁾ Patient satisfaction, an evaluation of services fully from the consumers' viewpoint, is a useful tool to assess quality of care.⁽¹⁷⁾ The PSS applied in this study was

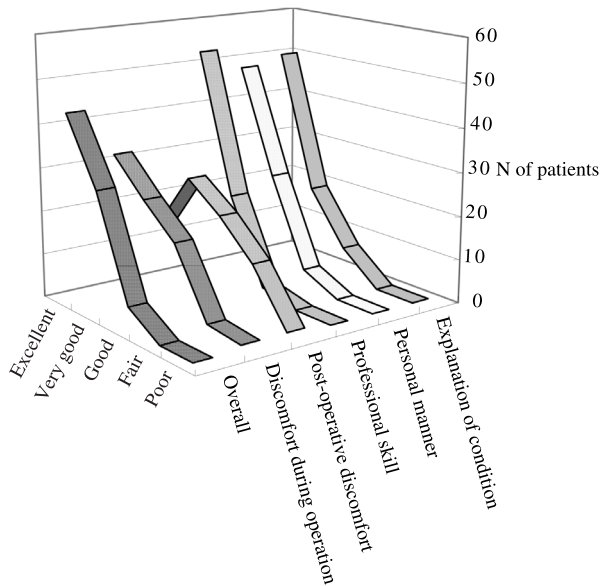


Fig. 1 Results of Patient Satisfaction Survey.

derived from Rubin and Ware’s model. It covers 6 important components of services and is customized specifically for surgical patients. The results revealed that 93.4% of patients rated their “overall” satisfaction as “very good” or “excellent”. This implies that the results of OSA surgery reach expectations among the majority of patients in the short-term. We assume the effect may come from surgical improvement of snoring, daytime somnolence and other OSA-related symptoms in highly-selected and site-specific treated study groups, as proved in previous studies.⁽¹⁸⁾ Of note, surgical outcomes may vary at different periods postoperatively. More specifically, the results of

OSA surgery usually deteriorate with time. Hence, it’s possible that the overall satisfaction with OSA surgery decreases in the long-term. In addition, patient satisfaction may differ with distinct societal and ethnic values. As a consequence, satisfaction with the same issue could be different in individual study populations.

Among the individual dimensions, “explanation of condition”, “personal manner” and “professional skill” showed high satisfaction levels (> 90% in “excellent” + “very good”) and these reflected patients’ great satisfaction with the caregiver’s explanation of OSA and surgery, with the quality of care, and with their postoperative condition, respectively. Meanwhile, the lowest satisfaction (53.9%)

Table 4. Significant Confounders in Patient Satisfaction

Dimension	β for Independent Variables		
	Age	Income	Baseline AHI
Overall (adjust R ² = 0.1)	‡-0.3*		
Discomfort during operation (adjust R ² = 0.07)	‡-0.4*	§5.5*	
Professional skill (adjust R ² = 0.07)			-0.1*
Personal manner (adjust R ² = 0.14)	‡-0.4†		
Explanation of condition (adjust R ² = 0.18)	‡-0.4†		

*: $p < 0.05$, †: $p < 0.01$; ‡: Patients satisfaction decreased with age; §: Patient satisfaction increased with income level; ||: Higher baseline AHIs had lower scores.

Table 3. Satisfaction Scores by Dimension

Dimension	UPPP (N = 17)	UPPP + SMP (N = 32)	UPPP + MLG (N = 27)	p value*
Overall	94.1 ± 9.4	86.9 ± 14.0	91.1 ± 11.5	0.175
Discomfort during operation	80 ± 17.3	83.1 ± 20.4	82.2 ± 17.8	0.718
Post-operative discomfort	69.4 ± 22.5	73.8 ± 19.3	67.4 ± 20.9	0.432
Professional skill	95.3 ± 8.7	92.5 ± 11.1	93.3 ± 11.1	0.711
Personal manner	90.6 ± 14.3	91.3 ± 11.3	92.6 ± 11.3	0.869
Explanation of condition	92.9 ± 12.1	91.3 ± 14.3	90.4 ± 12.9	0.750

Abbreviations: UPPP: uvulopalatopharyngoplasty; SMP: septomeatoplasty; MLG: midline laser glossectomy; *: Kruskal-Wallis test comparing UPPP, UPPP + SMP, and UPPP + MLG.

was noted in “postoperative discomfort” and this indicates that patients were only moderately satisfied with measures used to relieve postoperative pain and swallowing disturbance, demonstrating the necessity to improve in this area.

Different surgical methods in treating OSA may cause different outcomes. Combined surgery (UPPP plus SMP or UPPP plus MLG) involves surgical intervention at two levels of the upper airway and is intuitively considered to incur more postoperative discomfort than UPPP alone. However, the study showed no significant differences in patient satisfaction in all 6 dimensions of the PSS among the 3 surgical groups. We assume that postoperative discomfort is largely from the UPPP procedure with discomfort from the concomitant SMP or MLG relatively insignificant. As a consequence, patient satisfaction is less concerned with determination of the type of surgery (UPPP, or UPPP + SMP or UPPP + MLG). The choice of surgery needs to be made according to the levels of obstruction in the upper airway based on anatomic staging.⁽¹⁹⁾

Previous studies have claimed that patient satisfaction ratings can be biased by general attitude, life style, education level, disease severity, and perceptions of health.^(10,20) We confirm that this phenomena is also applicable for these OSA patients. Our regression analysis showed that patient characteristics confound satisfaction levels in many ways (Table 4). It is particularly interesting to find that older patients had lower overall satisfaction levels, were less tolerant of “perioperative discomfort”, and had lower satisfaction with the provider’s “personal manner”, and “explanation of condition”. We presume that older patients may have more comorbid disease and generally need longer wound recovery time after surgery than younger patients, and this consequently leads to lower satisfaction levels.

Conclusions

The dimension-specific PSS is an efficient measure to provide worthwhile information on patient satisfaction with surgery for OSA. Our preliminary survey reveals that the majority of patients are generally satisfied with UPPP and associated surgeries conducted simultaneously in the short-term. Combined nasal or tongue base surgeries can achieve patient satisfaction equivalent to that of UPPP alone. This study shows that patient factors such as age,

baseline severity and income level have various impacts on different dimensions of patient satisfaction.

Acknowledgements

The authors thank Ms. Ya-Hui Chen MHA at Cathay Medical Research Institute, Taipei, Taiwan for data management.

REFERENCES

1. Bassiri AG, Guilleminault C. Clinical features and evaluation of obstructive sleep apnea-hypopnea syndrome. In: Meir HK, Thomas R, Willaim CD, eds. Principles and Practice of Sleep Medicine. 3rd ed. Philadelphia, Pennsylvania: W.B. Saunders Co., 2000:869.
2. Peker Y, Hedner J, Norum J, Kraiczi H, Carlson J. Increased incidence of cardiovascular disease in middle-aged men with obstructive sleep apnea: a 7-year follow-up. *Am J Respir Crit Care Med* 2002;166:159-65.
3. He J, Kryger MH, Zorick FJ, Conway W, Roth T. Mortality and apnea index in obstructive sleep apnea. Experience in 385 male patients. *Chest* 1988;94:9-14.
4. Douglas NJ. Systemic review of the efficacy of nasal CPAP. *Thorax* 1998;53:414-5.
5. Fujita S, Conway W, Zorick F, Roth T. Surgical correction of anatomic abnormalities in obstructive sleep apnea syndrome: uvulopalatopharyngoplasty. *Otolaryngol Head Neck Surg* 1981;89:923-34.
6. Li HY, Li KK, Chen NH, Wang PC. Modified uvulopalatopharyngoplasty: the extended uvulopalatal flap. *Am J Otolaryngol* 2003;24:311-6.
7. Li HY, Wang PC, Hsu CY, Lee SW, Chen NH, Liu SA. Concomitant nasal and palatopharyngeal surgery for obstructive sleep apnea: simultaneous or staged. *Acta Otolaryngol* 2005;125:298-303.
8. Li HY, Wang PC, Hsu CY, Chen NH, Lee LA, Fang TJ. Same-stage palatopharyngeal and hypopharyngeal surgery for severe obstructive sleep apnea. *Acta Otolaryngol* 2004;124:820-6.
9. Sher E, Kenneth B, Jay F. The efficacy of surgical modifications of the upper airway in adults with obstructive sleep apnea syndrome. *Sleep* 1996;19:156-77.
10. Young GJ, Meterko M, Desai KR. Patient satisfaction with hospital care: effects of demographic and institutional characteristics. *Med Care* 2000;38:325-34.
11. Holland MS, Counte MA, Hinrichs BG. Determinants of patient satisfaction with outpatient surgery. *Qual Manag Health Care* 1995;4:82-90.
12. Tai CJ, Chu CC, Liang SC, Lin TF, Huang ZJ, Tsai YH, Wang PC. Use of patient satisfaction data in a continuous quality improvement program for endoscopic sinus surgery. *Otolaryngol Head Neck Surg* 2003;129:210-6.
13. Friedman M, Ibrahim H, Joseph NJ. Staging of obstructive

- tive sleep apnea/hypopnea syndrome: a guide to appropriate treatment. *Laryngoscope* 2004;114:454-9.
14. Rubin HR, Gandek B, Rogers WH, Kosinski M, McHorney CA, Ware JE Jr. Patients' rating of outpatient visits in different practice setting. *JAMA* 1993;270:835-40.
 15. Ware JE Jr, Hays RD. Methods for measuring patient satisfaction with specific medical encounters. *Med Care* 1988;26:393-402.
 16. Berwick DM. Continuous improvement as an ideal in health care. *N Engl J Med* 1989;320:53-6.
 17. Ware JE, Davies-Avery A, Steward AL. The measurement and meaning of patient satisfaction. *Health Med Care Serv Rev* 1978;1:1, 3-15.
 18. Li HY, Chen NH, Shu YH, Wang PC. Changes of quality of life and respiratory disturbance after extended uvulopalatal flap surgery in patients with obstructive sleep apnea. *Arch Otolaryngol Head Neck Surg* 2004;130:195-200.
 19. Li HY, Wang PC, Li LA, Chen NH, Fang TJ. Prediction of uvulopalatopharyngoplasty outcome: anatomy-based staging system versus severity-based staging system. *Sleep* 2006;29:1537-41.
 20. Woodbury D, Tracey D, McNight E. Does considering severity of illness improve interpretation of patient satisfaction data? *J Health Care Qual* 1998;20:33-40.

阻塞型睡眠呼吸中止症病人術後短期滿意度調查

蕭涵仁 王拔群^{1,2,3} 鄭溫暖⁴ 李立昂 陳寧宏⁵ 方端仁 李學禹⁶

背景：為了解因睡眠呼吸中止症 (obstructive sleep apnea) 接受手術後病患的滿意度。

方法：對於曾接受單純懸壅垂顎咽成型術 (uvulopalatopharyngoplasty)、或合併鼻中膈鼻道成型術 (septomeatoplasty) 或正中雷射舌切開術 (midline laser glossectomy) 等共 76 名病人，給予填寫病患滿意度問卷 (patient satisfaction survey)。並針對影響滿意度的各項因子加以探討。

結果：總體上，有 93.4% 病人認為整體的滿意度為「很好」(very good) 或是「非常好」(excellent)。在「專業技能」、「醫護人員態度」、「病情解釋」這幾個項目上病人有較高的滿意度 (非常好+很好 $\geq 90\%$)。相反地，在「手術前後的不適」項目上病人有較低的滿意度 (非常好+很好 $< 90\%$)。無論是接受單獨懸壅垂顎咽成型術、或合併鼻中膈鼻道成型術或正中雷射舌切開術的病人，滿意度並無顯著差異 ($p > 0.05$)。年齡增加會降低整體的滿意度 (adjust $R^2 = 0.1, p = 0.02$)。

結論：初步結果顯示因睡眠呼吸中止症接受手術的病人有高的整體滿意度。然而，因手術前後的不適會有較低的滿意度。即使加上鼻部或舌部的手術也能達到與單純接受懸壅垂顎咽成型術相同的滿意度。在接受睡眠呼吸中止症術後病人，年齡可能會干擾滿意度。

(長庚醫誌 2009;32:212-9)

關鍵詞：病人滿意度，睡眠呼吸中止症，懸壅垂顎咽成型術，鼻中膈鼻道成型術，正中雷射舌切開術

長庚紀念醫院 台北院區 耳鼻喉部，¹睡眠中心；長庚大學 醫學院；²國泰醫院 耳鼻喉部；³輔仁大學 醫學院；³中國醫藥大學 公共衛生學院；⁴台北體育大學 運動管理系；⁶長庚技術學院 護理系

受文日期：民國96年11月16日；接受刊載：民國97年5月13日

通訊作者：李學禹醫師，長庚紀念醫院 耳鼻喉部。桃園縣333龜山鄉復興街5號。Tel.: (03) 3281200轉3967;

Fax: (03) 3979361; E-mail: hyl38@cgmh.org.tw