The Effect of Septorhinoplasty on Quality of Life and Nasal Function in Asians

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Abstract: This is the first study that aimed to assess the effects of septrhinoplasty on quality of life (QOL) in an Asian population. The study consisted of 2 parts. First, the Derriford Appearance Scale 59 (DAS-59) was translated into Korean, and the reliability and validity were assessed by administering the Korean version of Derriford Appearance Scale 59 (DAS-59K) and 36-item short-form health survey to 88 inpatients scheduled for operations. Then, a prospective study was conducted which included 31 patients who underwent primary septrhinoplasty from October 2008 through May 2009. The changes in QOL and nasal symptoms were evaluated by comparing the preoperative and postoperative 3 month DAS-59K and nasal obstruction symptom evaluation scales. Principal component analysis of the DAS-59K showed an optimum 5-factor and the Cronbach α for each factor was greater than 0.7. Significant correlation was found between the DAS-59K and 36-item short-form health survey. Objective evaluation showed at least an improvement in every patient. After septrhinoplasty, there was improvement at scores related to general self-consciousness, negative self-concept, and physical stress (P < 0.05). The pattern of improvement differed by sex, age, and the presence of external nose deviation. Mean nasal obstruction symptom evaluation scores decreased significantly after surgery. The DAS-59K is a reliable and valid test, which can be a useful tool to assess individual response to living with problems of appearance. Septorhinoplasty improves both QOL and nasal function which should be taken into consideration in future counseling of individual patients expecting septrhinoplasty.

Key Words: rhinoplasty, quality of life, nasal function, Asian (Ann Plast Surg 2013;71: 40–44)

Patients who seek septrhinoplasty usually have complaints which include both aesthetic and functional aspects of the nose. The surgical goal in these patients involves managing both the cosmetic and functional problems that will eventually lead to improvement in their quality of life (QOL). Traditional assessment modalities of surgical success after surgery have been focused on morbidity, complications, and objective changes in nasal shape. However, the true surgical success of septrhinoplasty lies in improvement in QOL associated with self-perceived postoperative changes.

Only few studies have evaluated subjective improvement in QOL after septrhinoplasty,1,2 because it is difficult to measure a patients’ psychosocial and subjective satisfaction precisely. Several instruments, such as the Glasgow Benefit Inventory, the Medical Outcomes Study’s 36-item short-form health survey (SF-36), and the World Health Organization’s QOL assessment have been introduced to assess QOL quantitatively.3,4 However, these methods are limited in that their items are not directed specifically toward cosmetic surgery. The Derriford Appearance Scale 59 (DAS-59) is a self-reported scale that evaluates distress and dysfunction in problems of appearance.5 Previous studies using the DAS-59 have proven it to be a reliable method of assessing appearance-related QOL after aesthetic surgeries.6–8 The DAS-59 contains 59 self-reported items designed to generate a comprehensive assessment of the disruption of everyday living, problems with personal relations, and psychological distress associated with a perceived problem of appearance.5 Two items measure physical distress and dysfunction (PDD) and are not included in the total scoring. The items are subdivided into 6 factors, which are as follows: full scale score, 57 items; factor 1, General Self-consciousness of Appearance (GSC) (17 items); factor 2, Social Self-consciousness of Appearance (SSC) (20 items); factor 3, Self-consciousness of Sexual and Bodily appearance (SBSC) (9 items); factor 4, Negative Self-concept (NSC) (5 items); factor 5, Self-consciousness of Facial Appearance (FSC) (4 items); and factor 6, PDD (2 items). A higher score on the DAS-59 is associated with a greater degree of image-related distress and dysfunction.

The objective of this study was first to perform the translation of the DAS-59 questionnaire into Korean and to perform its psychometric validation. Then, we assessed the effect of septrhinoplasty on the QOL and nasal function using the validated Korean version of DAS-59 (DAS-59K).

To our knowledge, this is the first study to evaluate changes in QOL of patients undergoing rhinoplasty in Asians. Asian patients differ not only in anatomy, goals, and expectations but also the psychology behind cosmetic surgery certainly has some differences that stem from differences in culture.

MATERIALS AND METHODS

Validation of DAS-59K

First, a linguistic and cultural translation of the DAS-59 from English to Korean was performed. Then a prospective instrument validation study was performed at the Boramae Medical Center (BMC), Seoul, Korea. The study was approved by the institutional review board at the BMC.

Translation and Psychometric Validation of DAS-59K

The DAS-59 questionnaire was translated and adapted to the Korean language, with permission from the original authors, following internationally accepted guidelines.9,10 Ninety-six patients (53 men and 43 women), aged 18 to 60 years (mean age, 36.5 years), scheduled for any otolaryngologic surgery between March 2009 and August 2009 were the subjects of the psychometric validation. Patients who did not elect to participate in this study because of perceived time pressure or disinterest or any other reason were excluded, leaving 88 patients. Reliability was estimated by the internal
consistency (Cronbach α). Internal consistency was considered good if α exceed 0.70.

To determine construct validity, correlation of the DAS-59K with the mental component summary of the SF-36 questionnaire was evaluated. The present study used the Korean version of the SF-36. The relationship of DAS-59K with SF-36 was assessed by Spearman correlation.

Effect of Septorhinoplasty on QOL and Nasal Function

A prospective study was performed on patients who underwent septorhinoplasty from October 2008 to May 2009. Informed consent was obtained from all patients before enlisting their participation in the study. From a total of 72 patients, 31 patients (21 men and 10 women) who completed both the preoperative and postoperative questionnaires and were willing to participate with the objectives of the study were included. Age ranged from 15 to 65 years, with a mean age of 29 years. Patients with chronic sinusitis, intractable allergic rhinitis, and a history of rhinoplasty, septoplasty, or turbinoplasty were excluded. Patients without complaints of nasal obstruction were excluded from this study.

Outcome Measure

Initial diagnosis, surgical procedures, and complications were evaluated. Preoperative and postoperative 3 month photographs were evaluated for objective changes in the appearance of the nose by 2 rhinoplasty surgeons who were blinded to the objectives of this study. The postoperative result was graded in a 4-point scale (1 = worse, 2 = no change, 3 = improved, and 4 = much improved).

To evaluate the changes of QOL and nasal function after surgery, DAS-59K and the nasal obstruction symptom evaluation (NOSE) scale was administered preoperatively and 3 months after surgery.

Surgical Procedure and Follow-Up

Septorhinoplasty was performed, focusing on both aesthetic and functional aspects. All procedures were performed by the senior author (H.R.J.). Autologous cartilage (septal, auricular, or rib) was used for grafting purposes. External or endonasal approaches were chosen according to the type and severity of the nasal and septal deformity. Clinical follow-up included a complete physical examination, including rhinoscopic, endoscopic, and palpation of the nose, as well as regular photographs of the face. A representative case from our series is depicted in Figure 1.

Statistical Analysis

Statistical analyses were performed using the SPSS statistical software package (version 16.0; SPSS Inc, Chicago, IL). P values of less than 0.05 were considered to indicate statistical significance. The DAS-59K and the NOSE scale were analyzed preoperatively and postoperatively using both paired t tests and the Wilcoxon test. The mean percentage changes by sex, age, and the presence of a deviated nose were analyzed using the Mann-Whitney test to determine significant differences according to each group. The study was approved by the institutional review board of the BMC.

RESULTS

Reliability and Validity of DAS-59K

The translation was successful. After minor adjustments, the back-translation was compared with the original English version and did not show any conceptual content discrepancies between each version. The DAS-59K showed excellent results of principal component analysis and had strong internal consistency reliability with all domains showing Cronbach α greater than 0.7. Significant correlation was found between DAS-59K and the mental component summary of the SF-36.

Effect of Septorhinoplasty on QOL and Nasal Function

Initial Diagnosis, Surgical Procedure, Objective Outcome, and Complications

The 2 most common indications for septorhinoplasty were deviated nose (15 [48.4%] patients) and saddle nose (12 [38.7%] patients). Other diagnosis of the external nose included hump nose (6 [19.4%] patients), low profile nose (4 [12.9%] patients), and short nose (1 [3.2%] patient).

The surgical procedures performed are listed in Table 1. Surgical procedures to enhance cosmetic outcome included dorsal augmentation, hump removal, osteotomy, tip augmentation, and other tip-modifying techniques. Septal deviations, turbinate hypertrophy, and narrow nasal valves were corrected using septoplasty, submucosal turbinoplasty, spreader grafts, and alar batten grafts.

FIGURE 1. Preoperative frontal, lateral, and basal photographs (A, C, and E) of a 32-year-old patient from our series showing combined bony and cartilaginous deviation. Postoperative frontal, lateral, and basal photographs show improvement of her external nose deviation (B, D, and F).
Average postoperative objective score of the appearance of the nose was 3.6 with every patient showing at least an improvement (improved and much improved). No major complications occurred related to the surgical procedures.

### TABLE 1. Surgical Procedures Performed (N = 31)

| Mainly Cosmetic Procedures (%) |  |
|-------------------------------|--|
| Dorsal augmentation | 23 (74.2) |
| Osteotomy | 17 (54.8) |
| Tip augmentation | 14 (45.2) |
| Tip refinement | 12 (38.7) |
| Lateral osteotomy | 4 (12.9) |

| Mainly Functional Procedures (%) |  |
|---------------------------------|--|
| Septoplasty | 15 (48.4) |
| Spreader graft | 13 (41.9) |
| Turbinoplasty | 20 (64.3) |
| Alar batten graft | 6 (19.4) |

The numbers are not mutually exclusive.

### DAS-59K Scores

Total baseline DAS-59K scores and scores according to sex, age (<30 and >31), and the presence of a deviated nose are summarized in Table 2. The mean baseline total DAS-59K score in men and age group of 30 years or younger showed a tendency for a higher score than that in women and age group of older than 30 years. A statistically significant difference was observed in the mean baseline total DAS-59K score between the deviated nose group and non-deviated nose group (95.6 and 71.1, respectively; P < 0.05).

Mean total score of the DAS-59K decreased 3 months after surgery (79.8 vs 72.8). Scores for general self-consciousness (24.1 vs 20.6; P = 0.040), negative self-consciousness (13.7 vs 12.6; P = 0.033), and PDD (1.7 vs 1.5; P = 0.048) showed statistically significant decrease after surgery (Table 3).

The mean percentage change in the DAS-59K score was analyzed by subtracting the preoperative score from the postoperative score. The mean percentage change for the entire group showed a decrease in total score, GSC, NSC, and PDD, whereas SSC, SBSC, and FSC did not (Fig. 2).

Although the FSC score increased in the male group, it decreased in the female group. The PDD score decreased greatly in the male group compared to the female group (P = 0.032) (Fig. 3).

A different pattern of response was observed between 2 age groups arbitrarily divided into younger and older than 30 years, with respect to the GSC score (Fig. 4). Although the younger age group showed a decrease in mean percentage change, the older age group showed an increase.

The non-deviated nose group showed a decrease in the mean percentage change of GSC and FSC scores, whereas the deviated nose group showed an increase (Fig. 5) and was also observed after controlling for sex.

### The NOSE Score

In the baseline scores for the NOSE scale, men showed statistically higher NO1 and NO2 scores than women (2.8 vs 2.1; P < 0.05) (Table 1). The mean scores of the NOSE scale decreased in all patients after septorhinoplasty. Patients experienced statistically significant improvement in each of the 5 items on the NOSE scale (Table 2).

### DISCUSSION

This study aimed at evaluating the changes in QOL of Asian patients undergoing septorhinoplasty. The DAS-59, a psychometric scale for the evaluation of patients with aesthetic problems of appearance, was chosen for our investigation because it has been shown to demonstrate excellent validity, reliability, and internal consistency in both clinical and general populations.

To introduce the DAS-59 in our study population, it had to be translated and culturally adapted to the Korean language. It was also psychometrically validated to ensure its accuracy. To obtain these 2 goals, the first part of this study consisted of translation and validation of DAS-59K. The original English version of DAS-59 was successfully translated into the Korean language according to guidelines. The Korean version (DAS-59K) showed excellent reliability and internal consistency reflected by a Cronbach’s greater than 0.7 for every factor. Construct validity was proven in a population expecting surgery, by showing that the composite score of the

### TABLE 2. Baseline Scores of DAS-59K and NOSE Scale According to Sex, Age, and the Presence of External Nose Deviation

| Total (n = 31) | Male (n = 21) | Female (n = 10) | Age ≤ 30 y (n = 20) | Age > 31 y (n = 11) | Nondeviated Nose (n = 16) | Deviated Nose (n = 15) |
|---------------|--------------|----------------|---------------------|---------------------|---------------------|----------------------|
| **DAS-59K**   |              |                |                     |                     |                     |                      |
| Total score   | 79.8         | 81.2           | 76.7                | 85.7                | 69.0                | 91.8*                | 66.8*                |
| Factor 1, GSC | 24.1         | 23.8           | 24.9                | 26.3                | 20.1                | 29.8*                | 18.1*                |
| Factor 2, SSC | 21.4         | 22.8           | 18.5                | 23.4                | 17.8                | 24.6                | 18.0                |
| Factor 3, SBSC| 10.5         | 11.2           | 9.0                 | 11.6                | 8.5                 | 11.8                | 9.2                 |
| Factor 4, NSC | 13.7         | 13.0           | 15.1                | 13.4                | 14.1                | 14.0                | 13.3                |
| Factor 5, FSC | 6.1          | 6.4            | 6.7                 | 6.8                 | 6.5                 | 7.1                 | 5.2                 |
| Factor 6, PDD | 1.7          | 2.1            | 2.0                 | 2.3                 | 1.7                 | 2.6                 | 1.5                 |
| **NOSE scale**|              |                |                     |                     |                     |                      |                      |
| NO1           | 2.6          | 2.8*           | 2.1*                | 2.8                 | 2.3                 | 2.7                 | 2.6                 |
| NO2           | 2.3          | 2.6*           | 1.8*                | 2.5                 | 2.1                 | 2.5                 | 2.3                 |
| NO3           | 2.6          | 2.7            | 2.3                 | 2.7                 | 2.4                 | 2.6                 | 2.6                 |
| NO4           | 2.0          | 2.1            | 1.8                 | 2.1                 | 1.9                 | 2.0                 | 2.1                 |
| NO5           | 2.2          | 2.4            | 1.8                 | 2.3                 | 2.0                 | 2.2                 | 2.2                 |

*The P value for Mann-Whitney test was <0.05.

NO1 indicates nasal congestion, severity; NO2, nasal obstruction, frequency; NO3, trouble breathing; NO4, trouble sleeping; NO5, trouble exercising.
DAS-59K correlated with the mental component summary of the SF-36, which is one of the most popular tools to evaluate QOL.11,12 There was a difference in baseline scores between nondeviated and deviated nose group in total score and GSC, which implies that patients with nondeviated nose (saddle nose, hump nose, low profile nose, and short nose) had more appearance-related emotional concerns. We can speculate that among different types of external nasal deformities, the saddle nose, hump nose, and short nose exerts more emotional concern than a deviated nose, at least in Asians. The baseline scores for the men and in the younger-than-30-year age group were higher compared to their counterparts but did not show statistical difference.

Among the 6 factors evaluated in the DAS-59K, the current study showed significant improvement on F1 (GSC), F4 (NSC), and F6 (PDD) after surgery, whereas total score (FT), F2 (SBSC), F3 (SSC), and F5 (FSC) failed to show statistical improvement.

Our results show discrepancies from the original study of DAS 59 where all domains including the total score showed improvement after the same follow-up period of 3 months.5 Few explanations for this discrepancy may include the following. First, the original study was developed to evaluate QOL changes after facial cosmetic surgery not for septorhinoplasty alone. Rhinoplasty alone may have less impact in SBSC or FSC compared to patients receiving breast augmentation or reduction abdominoplasty or aging-face surgery, which showed a greater reduction in scores related to SBSC or FSC.14 Thus, rhinoplasty can provide better QOL through improvement in GSC and NSC, whereas other surgeries that manipulate general facial features or sexual body parts may improve FSC and SBSC.5 Second, cultural differences between the East and the West can be another reason for this discrepancy. Although it is not prudent to generalize the psychology of Asian patients undergoing rhinoplasty, Asian patients are somewhat modest in expressing their feelings and are more conscious of other people in their social life than Western people. They may be afraid of being depicted by others of their change in appearance, and consciously or unconsciously keep hiding they had surgery. This may have been reflected on the total score and SSC scores. Third, the concerns of the patients from our study group were a little different from concerns of patients with purely cosmetic issues, because they had concurrent functional issues. Although a

### Table 3. Preoperative and Postoperative DAS-59K and NOSE Scores

|                   | Preoperative (n = 31) | Postoperative (n = 31) | Change | P*   |
|-------------------|----------------------|------------------------|--------|------|
| DAS-59            |                      |                        |        |      |
| Total score       | 79.8                 | 72.8                   | -6.9   | 0.270|
| Factor 1, GSC     | 24.1                 | 20.6                   | -3.5   | 0.040*|
| Factor 2, SSC     | 21.4                 | 20.5                   | -1.4   | 0.431|
| Factor 3, SBSC    | 10.5                 | 10.5                   | 0      | 1.000|
| Factor 4, NSC     | 13.7                 | 12.6                   | -1.1   | 0.033*|
| Factor 5, FSC     | 6.1                  | 6.0                    | -0.1   | 0.717|
| Factor 6, PDD     | 1.7                  | 1.5                    | -0.2   | 0.048*|
| NOSE scale        |                      |                        |        |      |
| NO1               | 2.4                  | 1.3                    | -1.1   | <0.000|
| NO2               | 2.2                  | 1.4                    | -0.8   | <0.000|
| NO3               | 2.3                  | 0.8                    | -1.5   | <0.000|
| NO4               | 1.8                  | 0.6                    | -1.2   | <0.000|
| NO5               | 2.0                  | 0.7                    | -1.3   | <0.000|

*Paired t test was used.
The mean percentage of change in scores according to the existence of a deviated nose. The nondeviated nose group showed a decrease in total scores, whereas the deviated nose group did not. The decreased mean percentage of change in GSC (F1) and FSC (F5) was only noted in the nondeviated nose group.

When the patients were grouped according to their sex, 2 salient features were noted. There was a discrepancy in the change of score in FSC, whereas the mean percentage change in women showed improvement, it showed worsening in men and there was a considerable improvement in PDD in the male group. Although a definitive conclusion cannot be drawn, the main concerns in septorhinoplasty seem to differ between the 2 sexes. That is, women are more sensitive to their appearance, whereas men are more sensitive to physical dysfunction. A previous study has shown similar results of worsening of scores in the facial self-consciousness and the authors speculated that this was because cosmetic surgery is less socially acceptable for men and early results in a visible area such as the face can cause more distress in men.15

When the mean percentage of change in score was compared between 2 arbitrary age groups, the 30 years or younger age group showed decreased levels of postoperative discomfort in GSC compared to the older age group (>30). This may indicate that the younger population tends to be more favorable in accepting their changes in the short postoperative period. This result is in line with the report that appearance-related concern decreases with age; so young people pay more attention to their appearance and tend to be more sensitive to changes of facial features than old people.5 However, in another Western study, the youngest subgroup (16–30) was observed to have slightly increased levels of postoperative discomfort in the areas of self-consciousness compared to other age groups. We think that this also reflects the difference between the 2 cultures. Recently, in Asia, the young people feel more comfortable with the idea of cosmetic surgery as celebrities frequently appear with altered looks, as opposed to the more traditional age group who tend to be more conservative.

The greater change in DAS-59K score after surgery in the nondeviated nose group compared with the deviated nose group is noteworthy. Our data also showed that baseline DAS-59K scores in the nondeviated nose group were higher than the deviated nose group in all factors. Although very little is known about the psychological differences between the 2 groups, these findings collectively indicate that the nondeviated nose group, which includes low profile nose, hump nose, and saddle nose, experiences more distress and are more concerned about their external nasal features compared to the deviated nose group. This might be because the deviated nose group has a tendency to be more concerned about the recovery of their nasal function.

CONCLUSIONS

This is the first study that evaluates the changes in QOL after septorhinoplasty in an Asian population. The DAS-59K is a reliable and useful tool that can be used to assess individual response to living with problems of appearance in Korea. Our study suggests that septorhinoplasty may have a positive effect on QOL in Asians. The pattern of improvement differs according to sex, age, and the presence of external nose deviation. These factors should be taken into consideration in future counseling of individual patients who are expecting septorhinoplasty.

ACKNOWLEDGMENT

Informed consent was received for publication of the figures in this article.

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