Factors Influencing Patient Satisfaction with Upper Blepharoplasty in Elderly Patients

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Background: Upper blepharoplasty in elderly patients has characteristics that differ from those of younger patients. Blepharoptosis in elderly patients causes not only aesthetic problems but also functional problems such as entropion, visual disturbance, and sore eyes. We hypothesized that factors influencing patient satisfaction with upper blepharoplasty in elderly patients include aesthetic outcomes, functional outcomes, and personal factors.

Methods: This study included 57 patients aged >65 years who underwent upper blepharoplasty between April 2018 and March 2019. All surgeries were performed through the “Upper Blepharoplasty Service Project” of the public health center in Geoje City. To evaluate the individual characteristics of the patients, a preoperative questionnaire (including sociodemographic characteristics, main symptoms of discomfort in the upper eyelid, and degree of expectation of surgical results) was administered to the patients. After 6 months, a satisfaction survey was conducted accordingly.

Results: The main symptoms of discomfort were sagging of the skin of the upper eyelid. The mean score for patient satisfaction was 3.84 ± 0.40, and satisfaction with the results of surgery relative to the cost was 4.53 ± 0.63, which was the highest score. Significant verification of the regression coefficients showed that functional improvement and cognitive degree of postsurgery precautions had a significant effect on patient satisfaction, whereas aesthetic outcomes and expectations of surgical results were not correlated with patient satisfaction.

Conclusion: The findings indicated that elderly patients tended to be satisfied with functional improvement that resolved their symptoms of discomfort and personal factors such as cost and cognitive degree of precautions after upper blepharoplasty.

(Plast Reconstr Surg Glob Open 2021;9:e3727; doi: 10.1097/GOX.0000000000003727; Published online 6 August 2021.)

INTRODUCTION

Upper blepharoplasty is the most commonly performed aesthetic surgery in Korea. Unlike double-eyelid operations mainly performed in younger patients, this technique is mainly performed in elderly patients for rejuvenation by resecting redundant skin. In addition, upper blepharoplasty in elderly patients with blepharoptosis is caused by dehiscence or stretching of the aponeurosis to the tarsus and by nondelivery of contractile power to the upper eyelid, which requires tucking of the levator aponeurosis and suturing of the reversed septum to the orbicularis oculi muscle to the inferior flap. The most important purpose of upper blepharoplasty for elderly patients is to achieve harmonization with the person’s overall image rather than the aesthetic completeness of the upper eyelid itself.

Unlike other fields of medicine that use mortality and morbidity rates as the basis for evaluation, patient satisfaction is an important factor in aesthetic surgery. For successful practice, it is important to understand the factors that influence patient satisfaction. In upper blepharoplasty for elderly patients, the authors had experience with some patients who showed dissatisfaction despite good aesthetic outcomes. The authors hence hypothesized that other factors could have influenced patient satisfaction with upper blepharoplasty in elderly patients.

Disclosure: The authors have no financial interest to declare in relation to the content of this article.

Related Digital Media are available in the full-text version of the article on www.PRSGlobalOpen.com.
However, until now, studies published in Korea have focused only on the innovation of the surgical technique to improve aesthetic outcomes regardless of age. Complications following blepharoplasty occur regularly, and clinical surgeons try to solve this problem only through aesthetic surgical management. There has been a lack of effort to understand the needs of patients and the factors affecting a positive response to upper blepharoplasty in elderly patients.

The authors have had experience with different responses to patient satisfaction with aesthetic sutures in thyroidectomy through a transverse cervical incision, even though they were objectively assessed as having had the same aesthetic results. Therefore, in this study, the factors influencing the satisfaction of elderly patients who underwent upper blepharoplasty through the “Upper Blepharoplasty Service Project” conducted by Geoje Public Health Center were investigated accordingly. There were no previously available objective questionnaires to evaluate the factors influencing satisfaction in elderly patients who underwent upper blepharoplasty; therefore, we developed a novel questionnaire. For the item on expectations of the results, we referred to the item that investigated influence of patient satisfaction after receiving laser in situ keratomileusis, as published by Cho et al in 2004. The purpose of this study was to identify the factors influencing satisfaction in elderly patients, which included not only aesthetic outcomes but also functional outcomes, and to determine a way to enhance patient satisfaction levels.

METHODS

Study Subjects
A total of 57 patients who underwent upper blepharoplasty surgery through the Upper Blepharoplasty Service Project conducted by Geoje City Public Health Center between April 2018 and March 2019 were included in this prospective, longitudinal, descriptive study. This project was selected as an official project by the city to promote the health of the elderly by providing comprehensive health and medical services. All surgeries were performed in a cost-free manner. Priority was given to the schedule of surgery in the order of medical benefits and health insurance. All upper blepharoplasty procedures were performed by a single plastic surgeon. Preoperatively and at 6 months postoperative, patient data were collected through questionnaires in face-to-face interviews. When the patients visited the public health center before their surgery, the doctor in charge of the surgery provided them with information on the five postoperative precautions to be taken accordingly. This study was conducted after written informed consent was obtained from the patient and in accordance with the principles of the Declaration of Helsinki.

Surgical Indications
All included patients met the following four criteria:

1. Cases of involutional blepharoptosis and blepharochalasis that occurs during the normal aging process;
2. Cases of impaired visual field that interferes with daily life;
3. Eyelids intruding into the pupils in the front view;
4. Those with a risk of keratitis or impaired vision due to entropion accompanied by involutional blepharoptosis.

Exclusion criteria were cases of severe involutional ptosis (upper eyelid margin reflex distance ≤ 1 mm), uncontrolled hypertension, and uncontrolled diabetes. Patients with severe involutional ptosis were excluded because of the necessity to correct the Müller muscle and aponeurosis. Hypertension and diabetes were identified as risk factors for postoperative wound dehiscence, hematoma, and inflammation in all patients undergoing the upper blepharoplasty service project. Patients were asked if they were using aspirin or anticoagulants; any of these medications, if being consumed, had to be stopped by the patient before the week of surgery after consulting with a physician.

Surgical Technique
Upper blepharoplasty was performed by a single plastic surgeon at the Geoje Public Health Center. All surgical procedures were performed according to a study published by Cho in 2013.

We designed a skin removal procedure in which as the upper eyelid skin was expanded to 80%–90% of its full length, the desired double fold line was drawn, which was the lower skin excision line. The line was drawn at the same level after the lifted brow was released, which was the upper skin excision line. The previous design line was infiltrated with 2% lidocaine with 1:100,000 epinephrine. The skin layer was excised along the design line. The orbicularis oculi muscle (OOM) was excised while leaving 1–2 mm of OOM on the lower and upper skin lines, respectively. After carefully identifying the preaponeurotic fat, we opened the orbital septum from the lateral to the medial direction. In case the eyelid was fatty and bulging, a small incision on the septum was created to remove some fat tissue from the lateral compartment. If there was bulging on the medial side of the upper eyelid, fat removal should be carried out on the medial side as well. To create a natural double eyelid fold, fixation should be done to the tarsus or the levator aponeurosis at the level where the skin was slightly stretched. The needle was passed shallowly through the tarsus at this level, and finally the pretarsal OOM of the inferior flap was passed through and the suture was tied. Guiding fixation sutures should be placed while suturing the skin to decrease the tension on the permanent fixation sutures due to swelling. Usually three points of guiding fixation sutures were placed. These sutures were done by passing the needle through the skin and OOM of the lower flap, tarsus, and then the skin and OOM of the upper flap, to prevent depression scars. Then the rest of the skin was sutured using continuous sutures.

Study Methods
There were no previously available objective questionnaires to evaluate the factors influencing satisfaction in
elderly patients who underwent upper blepharoplasty; therefore, we developed a novel questionnaire. (See questionnaire, Supplemental Digital Content 1, which displays the representative postoperative questionnaire. http://links.lww.com/PRSGO/B730.) Surveys were conducted preoperatively and 6 months postoperatively. Elderly patients were asked to visit the public health center 1 week before surgery, and the data were collected through questionnaires in face-to-face interviews. We evaluated the sociodemographic characteristics of patients, such as gender, age, medical level, education level, medical history (hypertension, diabetes), and main symptoms of discomfort. The questionnaires also inquired about expectations related to improvements in appearance that the patients would experience after upper blepharoplasty. In response to this question, the participants responded using a Likert five-point scale (1: not very expected, 2: not expected, 3: expected a little, 4: expected, 5: very expected). Finally, the plastic surgeon in-charge, who works at Geoje Public Health Center, explained and provided training to the patients on five postoperative precautions, which were as follows:

1. An ice pack should be applied for 2 days after surgery to prevent swelling and bruising. A warm pack was applied after stitching out. An ice pack and warm pack should be used as often as possible.
2. Swelling and bruises appear immediately after the surgery. These bruises usually disappear in about 2 weeks; however, the swelling can gradually disappear in 3–6 months, which could be prolonged in cases of physical problems or reoperation.
3. Side effects such as height differences, swelling, and scarring may occur. Corrections can be made after consulting with the doctor in charge of the surgery.
4. Alcohol, smoking, heavy exercise, overstraining, and saunas should be avoided for 1 month after surgery.
5. Those genetically susceptible to scarring constitution or who have undergone multiple surgeries may use scar ointment. However, in normal cases, direct sunlight should be avoided, and the use of sunscreen is sufficient.

A satisfaction survey was conducted at the time of the follow-up observation at 6 months. (See questionnaire, Supplemental Digital Content 2, which displays the representative postoperative questionnaire. http://links.lww.com/PRSGO/B731.)

This survey consisted of seven categories: overall satisfaction with the operation, quality of life improvement after surgery, degree of expected satisfaction through surgery, satisfaction with postoperative recovery speed, recommendation to operate on friends and family, achievement of surgical purpose, and satisfaction with the results of surgery relative to the cost. Each question was calculated by calculating the average value of the seven categories. The authors defined the uncomfortable symptoms of patients caused by blepharoptosis or dermatochalasis in elderly patients as functional problems, and classified them as sagging skin of the upper eyelids, entropion, visual disturbances, wrinkles around the eyes, abnormal eyebrow position, and sore eyes. Functional improvement was measured using a Likert five-point scale (1: not improved at all, 2: not improved, 3: slightly improved, 4: improved, 5: very improved). The subjects gave points based on their satisfaction with the improvement of their main symptoms. To measure the level of awareness of postoperative precautions, five questions from the postoperative precautions were used to measure satisfaction. One point was assigned for each of these questions to measure the perceived degree on a Likert five-point scale (the higher the points for the five questions, the higher the recognition). Finally, clinical photographs were evaluated by two plastic surgeons who were not involved in the surgery for aesthetic outcome scores. The mean of the two scores was calculated. (See table, Supplemental Digital Content 3, which displays the representative postoperative doctor’s records. http://links.lww.com/PRSGO/B732.)

**Statistical Analysis**

The collected data were analyzed using the SPSS WIN version 18.0 (SPSS Inc., Chicago, Ill.). In all statistical comparisons, a P value of 0.05 or less, was considered significant. Data analysis was performed as follows:

1. Frequency analysis was conducted on the sociodemographic characteristics of subjects.
2. Frequency analysis was conducted on patients’ postoperative satisfaction with upper blepharoplasty.
3. Frequency analysis was conducted on the scores of functional improvement and aesthetic outcomes.
4. An independent sample t-test was conducted to verify that there were significant differences in the average satisfaction according to gender, medical level, hypertension, and diabetes.
5. A one-way analysis of variance was conducted to verify whether the mean of average satisfaction differed significantly with age, education level, and main symptoms of discomfort. Differences between groups were examined using the Scheffe test.
6. Multiple regression analysis was conducted to identify the factors affecting the satisfaction level, using the average satisfaction as a dependent variable, and the aesthetic outcome, functional improvement, preoperative expectations of surgical results, and cognitive degree of postsurgery precautions as independent variables.

**RESULTS**

**Sociodemographic Characteristics**

The results of the sociodemographic analysis are presented in Table 1. There were 42 women (73.7%) and 15 men (26.3%). The number of subjects in each age group was as follows: 16 (28.1%) in their 60s, 33 (57.9%) in their 70s, and eight (14.0%) in their 80s. Eight patients (14.0%) were covered by health care benefits, whereas the remaining 49 (86.0%) were covered by health insurance. Most patients
for satisfaction with the results of surgery relative to the satisfaction with upper blepharoplasty. The average score was 3.84 ± 0.40 in terms of patient satisfaction. The average aesthetic outcome score of the elderly patients who underwent upper blepharoplasty was an average score of 4.00 ± 0.65 (Table 3). The average aesthetic outcome score evaluated by two plastic surgeons who were not involved in surgery was 3.69 ± 0.55 (Table 4).

### Functional Improvement and Aesthetic Outcome Scores in Elderly Patients

The average functional improvement of the elderly patients who underwent upper blepharoplasty was an average score of 4.00 ± 0.65 (Table 3). The average aesthetic outcome score evaluated by two plastic surgeons who were not involved in surgery was 3.69 ± 0.55 (Table 4).

### Comparison of Patient Satisfaction by Sociodemographic Characteristics and Main Symptom of Discomfort

An independent sample t-test was conducted to verify whether there were significant differences in the average satisfaction scores according to gender, medical level, hypertension, and diabetes. Satisfaction scores based on gender were 3.80 for women and 3.93 for men. The scores were 3.75 for those covered by health care benefits and 3.85 for those covered by health insurance. Patients diagnosed and those who were not diagnosed with hypertension had average scores of 3.87 and 3.81, respectively. People diagnosed and those who were not diagnosed with diabetes had average scores of 3.95 and 3.82, respectively. However, the average satisfaction scores were not significantly different with respect to gender, medical level, hypertension, and diabetes (Table 5). One-way analysis of variance was conducted to verify whether the mean of average patient satisfaction scores differed significantly with age, education level, and the main symptom of discomfort. Regarding age, patients in their 60s, 70s, and 80s had average scores of 3.84, 3.88, and 3.64, respectively. According to their educational background, patients with no institutional education, elementary school graduates, middle school graduates, and high school graduates had average scores of 3.63, 3.82, 3.90, and 3.65, respectively. Regarding the main symptoms of discomfort related to the preoperative upper eyelid, patient satisfaction related to “sagging skin of the upper eyelid,” “eyelashes poke the pupils due to entropion,” “visual disturbances due to redundant skin,” “wrinkles around the eyes,” “abnormal eyebrow positions,” and “sore eyes” had average scores of 3.93 and 0.84.
the following average scores: 3.86, 3.83, 3.81, 4.13, 3.75, and 3.82, respectively. However, the average satisfaction scores did not show significant differences according to age, education level, and main symptoms of discomfort (Table 6).

### Influencing Factors of Satisfaction on the Upper Blepharoplasty for Elderly Patients

Multiple regression analysis was conducted to verify the effect of aesthetic outcomes, functional improvement, expectations of surgical results, and cognitive degree of postsurgery precautions on average patient satisfaction. Subsequently, the regression model was significant ($F = 39.854, P < 0.001$), and the explanatory power of the regression model was approximately 75.4% ($R^2 = 0.754$, $\text{adj}R^2 = 0.735$). Meanwhile, the Durbin-Watson statistic was 1.968, which was close to two, indicating no problem with the independence assumption of the residuals. The variance inflation factor was 10 or less, indicating no multicollinearity. The significance verification of the regression coefficients showed that functional improvement ($\beta = 0.371, P < 0.001$) and cognitive degree of postsurgery precautions ($\beta = 0.511, P < 0.001$) had a significant effect on average patient satisfaction. Thus, the average satisfaction increased with functional improvement and cognitive degree of postsurgery precautions. Comparing the size of the standardized coefficient, it has been verified that the standardized coefficient greatly affects average satisfaction with respect to the cognitive degree of precautions after surgery ($\beta = 0.511$) and functional improvement ($\beta = 0.371$). In contrast, aesthetic outcomes and expectations of surgical results were not correlated with average satisfaction (Table 7).

| Table 3. Measurement of Functional Improvement Scores |
|-----------------------------------------------|
| n (%)                                      |
| Not Improved At All (Score = 1) | Not Improved (2) | Slightly Improved (3) | Improved (4) | Very Improved (5) | Mean Score (SD) |
|------------------------------------------|------------------|-----------------------|--------------|------------------|-----------------|
| Functional Improvement                  | 0                | 0                     | 12           | 33               | 12              | 4.00 (0.65)     |

| Table 4. Measurement of Aesthetic Outcomes by Two Plastic Surgeons |
|---------------------------------------------------------------|
| n (%)                                                                |
| Very Negative (Score = 1) | Negative (2) | Neither Positive nor Negative (3) | Positive (4) | Very Positive (5) | Mean Score |
|---------------------------|--------------|---------------------------------|--------------|------------------|------------|
| Plastic surgeon 1         | 0            | 1                               | 16           | 37               | 5          | 3.74 (0.58)  |
| Plastic surgeon 2         | 0            | 3                               | 19           | 30               | 5          | 3.65 (0.71)  |
| Total                     | 0            | 4                               | 35           | 67               | 10         | 3.69 (0.55)  |

| Table 5. Comparison of Patient Satisfaction based on Sociodemographic Characteristics Using Independent T-test |
|---------------------------------------------------------------------------------------------------------------|
| Dependent Variables | Group | Mean | SD | t | P |
|---------------------|-------|------|----|---|---|
| Gender              | Men   | 3.93 | 0.460 | 1.000 | 0.322 |
|                     | Women | 3.80 | 0.383 |
| Medical level       | Medical benefits | 3.75 | 0.347 | -0.643 | 0.523 |
|                     | Health insurance | 3.85 | 0.414 |
| Hypertension        | Normal | 3.81 | 0.441 | -0.508 | 0.614 |
|                     | Hypertension | 3.87 | 0.360 |
| Diabetes            | Normal | 3.82 | 0.398 | -0.773 | 0.443 |
|                     | Diabetes | 3.95 | 0.461 |

| Table 6. Comparison of Patient Satisfaction Based on Sociodemographic Characteristics Using One-way Analysis of Variance |
|-------------------------------------------------------------------------------------------------------------------------------|
| Variables | Group | Mean | SD | F | P | Scheffe |
|------------|-------|------|----|---|---|---------|
| Age        | 65–69 | 3.84 | 0.389 | 1.163 | 0.320 | — |
|            | 70–79 | 3.88 | 0.436 |
|            | 80–89 | 3.64 | 0.236 |
|            | Total | 3.85 | 0.404 |
| Education  | Uneducated | 3.00 | 0.000 | 0.641 | 0.592 | — |
|            | Elementary school | 3.22 | 0.902 |
|            | Middle school | 3.41 | 0.931 |
|            | High school | 2.83 | 1.329 |
|            | Total | 3.26 | 0.955 |
| Main uncomfortable symptom | Sagging skin of the upper eyelid | 3.86 | 0.359 | 0.405 | 0.843 | — |
|            | Eyelashes poke the pupils due to entropion | 3.83 | 0.584 |
|            | Visual disturbances | 3.81 | 0.439 |
|            | Wrinkles around the eyes | 4.13 | 0.000 |
|            | Abnormal eyebrow positions | 3.75 | 0.345 |
|            | Sore eyes | 3.82 | 0.507 |
|            | Total | 3.84 | 0.404 |
In this study, we described the factors affecting upper blepharoplasty and patient satisfaction in elderly patients. Upper blepharoplasty in young patients aims to yield aesthetically pleasing upper eyelids by creating a fold and thinning of the eyelids. In contrast, upper blepharoplasty in elderly patients is employed to achieve youthful eyelids by excising sagging tissue. The primary purpose of upper blepharoplasty for elderly patients is to achieve harmonization with the person’s overall image rather than the aesthetic completeness of the upper eyelid itself. In this study, we hypothesized that factors other than aesthetic outcomes affect the satisfaction level of elderly patients, as the purpose of surgery differs with age.

In terms of sociodemographic characteristics, we expected active participation from health care benefit targets because of the low cost of the public health center project. The study found that only eight people (14.0%) were eligible for health care benefit targets. The reasons were as follows: absence of personal transportation; high financial burden, such as loss of wages on days when one cannot work and return transportation expenses; high illiteracy rate; and lack of information about the project. Most discomfort symptoms were caused by the redundant skin. According to Cho, the purpose of upper blepharoplasty for elderly patients is to correct the sagging of the eyelids.

The overall patient satisfaction level was high at 3.84 ± 0.40. Of the seven questions that measured satisfaction, the question “satisfaction with the results of surgery relative to the cost” scored the highest at 4.53 ± 0.63. This shows that costs are an essential consideration for elderly patients. According to Swami et al, the cost is significantly affected satisfaction levels. Previous studies by Olson et al and Mira et al revealed that a surgeon’s explanation significantly affected satisfaction levels.

Comparison of patient satisfaction by sociodemographic characteristics in this study showed that there was no statistically significant difference in gender, age, medical level, educational background, high blood pressure, diabetes, and main uncomfortable symptoms of discomfort. Chung et al conducted a study on the prognosis of plastic surgery outpatients and reported that patient age did not significantly affect patient satisfaction levels. According to a study that reported on the expectations of patients regarding orthognathic surgery, educational background did not affect the satisfaction level.

At the outset of this investigation, we formulated the following four testable hypotheses of factors that affect satisfaction level of elderly patients after upper blepharoplasty: aesthetic outcomes, functional improvement, preoperative expectations of surgical results, and cognitive degree of postsurgery precautions. In contrast to our expectations, the preoperative expectations of surgical results were not significantly correlated with the satisfaction level. Various studies have been conducted on the effects of patient expectations on satisfaction. Some studies have shown that expectations are a strong predictor of satisfaction. In contrast, studies have shown a weak correlation between expectations and satisfaction. The reason for this inconsistency in findings may be attributed to the differences in the fundamental characteristics of the target medical service, the tools used to measure expectations, the timing and method of measurement, and the types of confounding variables corrected. In general, even with the same level of treatment results, the patient’s satisfaction differs according to the patient’s expectations before treatment. In other words, satisfaction is determined by the degree of achievement of expectations before and after treatment.

In 2002, Eisle et al reported that postsurgical satisfaction increased with an increase in disease severity. However, our study did not demonstrate any significant correlation between the degree of discomfort due to preoperative blepharoptosis and satisfaction. The study participants completed the questionnaire regarding their expectations and main symptoms of discomfort after we explained the operation procedure and precautions to them, so that they had sufficient knowledge and understanding of aging blepharoplasty. This is believed to be due to the relatively realistic state of measurement and the relatively small gap between expectations and perceived outcomes.

In this study, multiple regression analysis showed that the cognitive degree of postsurgery precautions significantly affected satisfaction levels. Previous studies by Olson et al and Mira et al revealed that a surgeon’s explanation
of the surgical process and postoperative precautions had a significant effect on patient satisfaction.\textsuperscript{13,20} To improve the satisfaction level among elderly patients, it is, hence, necessary to provide a detailed explanation of postoperative precautions according to the age of the subject.

Clapham et al modified Ware’s taxonomy, which affects patient satisfaction, making it applicable to the field of plastic surgery. In addition, they conducted a literature review of 178 studies on the factors that affect patient satisfaction after plastic surgery. They found that cosmetic and functional factors were significantly correlated with satisfaction levels.\textsuperscript{21} In this study, functional improvement significantly affected satisfaction, but aesthetic outcomes were not significantly correlated.
with satisfaction level. The reason for this could be that, in contrast to the double eyelid operations performed to obtain aesthetically pleasing upper eyelids mainly in young patients, upper blepharoplasty for elderly patients is mainly performed to improve their quality of life by resecting redundant skin, muscle, and fat around the periorbital. Notably, some elderly patients answered that, despite a high aesthetic outcome score, the degree of functional improvement was low. Conversely, some patients with low aesthetic outcome scores were satisfied with the functional improvement (Figs. 1, 2). This is an important finding because many plastic surgeons still focus only on the aesthetic outcome of upper blepharoplasty, regardless of the patient’s age. The goal of surgery performed on elderly patients must be to understand and relieve the difficulties faced by the patients because of the symptoms of discomfort, which will subsequently help achieve patient satisfaction.

The limitations of this study are as follows. First, because the subjects were selected only from the local residents of Geoje, the group was not representative of the entire elderly population who underwent upper blepharoplasty. Second, attention should be paid to generalization of the satisfaction of the entire plastic surgery clinic or direct comparison with the satisfaction of various aesthetic procedures, given that the health care center projects involving the subjects have performed the surgery. This study targeted elderly patients who received upper blepharoplasty through the Upper Blepharoplasty Service Project by the public health center in Geoje City, which was a public project. Therefore, they underwent cost-free surgery. We believe that because the subjects of this study received the surgery for free, they reported relatively higher satisfaction in terms of cost than they might have otherwise.

In conclusion, elderly patients who underwent upper blepharoplasty tended to be satisfied with the functional improvement that resolved their symptoms of discomfort due to blepharoptosis and dermatochalasis and personal factors such as cost and cognitive degree of postsurgery precautions. Therefore, understanding and relieving the difficulties faced by elderly patients because of the symptoms of discomfort, sufficient explanation of postoperative precautions, and the application of health care insurance may contribute to enhanced postoperative satisfaction in elderly patients (Figs. 3, 4).

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**PATIENT CONSENT**

The patients provided written informed consent for the use of their images.