

Revision Rhinoplasty

Jiann-Jy Chen¹, Dem-Lion Chen², Chuan-Hsiang Kao³, Hsing-Won Wang³

Department of Otorhinolaryngology, Tao-Yuan Hospital, Department of Health, Executive Yuan¹
G-Home Otorhinolaryngologic Clinic²,

Department of Otolaryngology-Head and Neck Surgery, Tri-Service General Hospital, National Defense Medical Center³

ABSTRACT

Background: Revision rhinoplasty is a challenge for facial reconstructive surgery. Previous surgery makes revision more difficult. The procedure requires detailed preoperative evaluation and planning to correct the key deformity and reconstruct the internal support, external soft tissue, or skin of the nose.

Methods: Between October 2001 and February 2005, 27 patients (24 males and 3 females) who underwent revision rhinoplasty were enrolled at a medical center in North Taiwan. Their ages ranged from 20 to 56 years with a mean age of 27.. An unsatisfactory result (n=16) or problems with an artificial or autogenous graft (n=11) were the reasons patients sought revision. Major revision procedures were performed in an open approach. These included harvest of autogenous cartilage grafts (n=18), replacement with new artificial grafts (n=4), and osteotomy with modification of previous grafting (n=5).

Results: There were 2 cases of post-revision complications (nasal hematoma and auricular hematoma) which responded to adequate incision & drainage. To date, there have been no residual functional complications although 2 patients were displeased with the results so that the rate of satisfaction was 93% (25/27).

Conclusions: Revision rhinoplasty is more difficult than primary rhinoplasty because of the

altered anatomy and scar tissue. Surgeon and patient must agree on the goal pre-operatively. A better operative field can be achieved in an open approach, and this contributes to a successful outcome.

Key words: Grafting, Revision rhinoplasty, Rhinoplasty

INTRODUCTION

Nose is located in the midline face and is the most prominent bony structure. Its size and shape is as important as eyes to the facial beauty. Rhinoplasty has developed popular in Taiwan recently. Except aesthetic plastic surgeons, more and more otorhinolaryngology head and neck surgeons attend to this professional field. They all think the goal of rhinoplasty not only to improve the nasal beauty, but also to cure functional disorders. Patients always ask revision rhinoplasty for a previous post-operative complication or an unsatisfactory result, but revision rhinoplasty is more difficult than primary rhinoplasty, so revision rhinoplasty is a special topic. The aim of the paper is to present our experience and opinion in revision rhinoplasty.

MATERIALS AND METHODS

Patients

Between October 2001 and February 2005, 27 patients (24 males and 3 females) who underwent revision rhinoplasty are enrolled (table 1) at a medical center in North Taiwan. Their ages ranged

from 20 to 56 years with a mean age of 27 years. The etiology can be divided into subjective and objective factors (table 2). The subjective factors were unsatisfactory appearance of nose, including uncorrectable twisted nose (n=11), unsatisfactory artificial grafting (n=1), nasal hump (case 3, figure 1A), wide nasal root (case 6), short nose (case 7), saddle and retrousse nose (case 4) et al, without any functional disorder. Nasal synechia was noted in case 6. The objective factors were complications of grafting (n=11), including dislocation or protrusion of artificial graft (7/11), and protrusion or absorption of autogenous graft (4/11). Case 13 and 22 suffered nasal stuffiness and wound infection respectively with complication of autogenous graft.

We took history and performed physical examination in all the patients. After they have signed the “authorization of photography”, we took pictures for pre-operative evaluations in a special photo studio. We evaluated if an autogenous graft is mandatory, which site of body denotes cartilage, and if there is a contraindication of cartilage harvesting, such as keloid tendency [1]. After a common consensus between patients and the surgeon has been made about the whole surgical procedures and possible results, patients were hospitalized for revision rhinoplasty under general anesthesia.

Surgical Methods

1) The open procedure started as an inverted “V” transcolumellar and bilateral marginal incision. The myocutaneous flap of nasal dorsum was elevated along the lower lateral cartilages and upper lateral cartilages. The related structures below the myocutaneous flap are identified, such as lower lateral cartilages, upper lateral cartilages, and septal cartilage etc. The scar tissue was cleaned, and the vasculature of the underlying tissue was preserved. The periosteal flap should be elevated cephalically to the forehead and the whole nasal bones are exposed if we want to change the position of radix [2]. 2) The cymba and cavum donated an auricular cartilage [3], and the right 7th rib donated a costal

cartilage if cartilage grafting is required. 3) The previous grafting was taken out, and the adhering scar tissue was cleaned out. 4) The perichondria were separated from the anterior margin of septal cartilage. The deviated nasal septum was corrected, or the middle region of septal cartilage was harvested for the following grafting [4]. 5) The grafts were sculptured for grafting, such as auricular, costal, or septal cartilages, artificial grafts and previous grafting etc. 6) In order to correct the twist of nasal bone, medial osteotomy was performed in medial side of nasal bone of nasal pyramid, and lateral osteotomy was performed in lateral side of frontal process of maxilla. 7) The grafts were placed in their planned positions and fixed with 6-0 monofilament polydioxanone suture (PDS) in the nose to form a fire-new nose. 8) The surgical field was covered back with the myocutaneous flap. The nasal septum and bilateral mucosa layer were trans-fixed sutured with a 4-0 chromic catgut thread, and the anterior marginal incisions of nasal ala were closed with 5-0 chromic catgut suture. The transcolumellar incision was closed by subdermal suture with 6-0 PDS and then vertical mattress suture with a 7-0-nylon thread. 9) The nasal cavities were packed with Merocele if inferior turbinectomy has been performed. A thermoplastic plate was applied externally to keep the nasal dorsum in following 5 to 7 days.

Preventive broad-spectrum antibiotics (1st generation cephalosporin) were administered intravenously in the following 3 days after surgery. The dressing of surgical incision was changed regularly. The patient was discharged 3 days after surgery. In the following month, he was warned against violent exercise, scrubbing the nose, sunlight exposure, cigarette smoking and alcohol drinking. In the 7th day after surgery, the stitches were removed from the nasal column, and auricle, and the thermoplastic external fixation was removed at out-patient-department, too. But the stitches were not removed from the right chest till the 10th day after surgery.

RESULTS

Major procedures

After an open procedure started as an inverted “V” transcolumnellar and bilateral marginal incisions, the major procedures are listed in table 3 and described as followed: A). Autogenous cartilage grafting was performed in 18 cases, including 12 pieces of auricular cartilages, 10 nasal septal cartilages, and 6 rib cartilages. Fresh cartilage grafts were replaced with the previous artificial grafts in 6 cases (figure 2). B). Artificial grafting was performed in 4 cases, that ascribed to the previous unsatisfactory artificial graft in patient 8, the previous absorbed and deformed autogenous graft in case 13, and unsatisfactory appearance in case 4 and 7. C). Osteotomy was performed simply in 5 cases with modification or removal of previous grafting because of unsatisfactory appearance.

Of all, reuse and modification of previous artificial grafting was performed in 2 cases (figure 3) because of dislocation. Autogenous fresh cartilage grafting with osteotomy was performed in 2 patients, case 23 and 24. The previous autogenous grafting was removed from 2 cases, case 16 and 9. Then case 16 underwent a fresh autogenous cartilage grafting, and case 9 underwent osteotomy simply.

Postoperative follow up

There were 2 cases of post-revision complications, including nasal hematoma in case 22 and auricular hematoma in case 16, which were cured after adequate incision and drainage. Up to the present time, there were no residual functional complications, except 2 cases were not satisfied with this revision rhinoplasty, including patient 18 and 27, so satisfactory rate only achieved 93%(25/27). The nostrils were asymmetrical after reuse and modification of the previous troublemaking L shape silicon graft in case 18 (figure 3D), and scar hypertrophy recurred in case 27 (figure 4) despite that most post-multiple-revisions hypertrophic scar tissue has been cleaned in this revision. The postoperative duration is 41.2 months in average, ranging from 20.5 to 61 months.

DISCUSSION

Detailed history taking and physical examination are mandatory for revision rhinoplasty, and the mental state of patient should be taken meanwhile [5]. History taking should cover which kind of nasal surgery has been performed in the past, including functional endoscopic sinus surgery, septoplasty, rhinoplasty and augmentation rhinoplasty etc. But the patient sometimes cannot confirm which kind of nasal surgery was performed, and the past history he declared disagrees with the fact. Therefore, it is important to perform a detailed physical examination. We inspect if there is a surgical scar at nasal column, auricle, chest, or inside nasal mucosa, and if there is nasal polyp, hypertrophic turbinate, nasal septal deviation or septal perforation in nasal cavities. Besides, we should palpate the shape and rigidity of nose, auricle and chest to evaluate which kind of autogenous cartilage graft is available or suitable for transplantation, which kind of revision is indicated, and if there is a contraindication of revision. We should ask the patient which kind of graft, autogenous or artificial, he/she prefers for augmentation rhinoplasty. The patient and his/her family should be informed of the risk of revision. A revision rhinoplasty should be hold till surgeons and patients come to terms with a common consensus that the goal of revision is improvement instead of perfection [6].

Revision rhinoplasty is more difficult than primary rhinoplasty because of unclear anatomies and scar tissues. The internal nasal structures should be dissected delicately and identified after hypertrophic scar tissue is cleaned appropriately. The nasal tip should be reconstructed with grafting because the support of lower lateral cartilages must be insufficient after multiple surgeries. The nasal septal cartilage, auricular cartilage, and costal cartilage should be manipulated in a scaled chopping block to form an appropriate shape and size. In order to be manipulated into tip shield graft, lateral crural strut, splinting graft, columellar strut, onlay graft, spreader graft etc, grafts are double or

multiple combined with 6-0 PDS suture. They are placed and fixed to the key positions of original nasal cartilages and bones with 5-0 or 6-0 PDS suture, so as to correct short nose, retrousse nose, twisted nose, saddle nose, nasal hump (figure 1A), and asymmetric nostrils (figure 3A). We frequently turned back the myocutaneous flap to judge if the shape had come to that we has bargained with the patient, especially when the patient received revision in the cause of unsatisfactory appearance.

Case 11, who underwent augmentation rhinoplasty with nasal septal cartilage and artificial graft (porous high-density polyethylene, Medpor) before, went in quest of revision because the artificial grafting dislocated. We modified the troublemaking Medpor and reconstructed the nasal tip with his auricular cartilage graft. Case 17, who suffered from congenital cleft lip nose and underwent repair when young, underwent augmentation rhinoplasty with nasal septal cartilage and Medpor at our department before. But in the 3rd year after primary rhinoplasty, the Medpor was removed for the sake of protrusion and exposure. Two months after the wound healed, he underwent this revision rhinoplasty. The fresh auricular cartilage and the previous nasal septal cartilage graft were both manipulated into new grafting. Therefore in our opinion, the autogenous cartilage graft is preferred for young people if they undergo revision rhinoplasty, so as to avoid the protrusion of artificial graft and another revision.

We suggest the grafts are steeped in normal saline with Chloramphenical in revision surgery, and the surgical field is irrigated at the end of revision though it is controversial to prevent wound infection with the method [7]. But an absolute aseptic field is essential when we harvest the auricular or costal cartilage. A broad-spectrum antibiotic (1st generation cephalosprin) is suggested administered intravenously 30 minutes before surgery, and maintaining doses are given every 4 hours during surgery. The post-operative care of revision is the same as primary rhinoplasty, so as to relieve pain, find complication early, and prevent further infection,

dislocation or deformity. Unfortunately, there were 2 cases of post-revision complications in our revisions, including auricular hematoma and nasal hematoma, which might be caused by insufficient compression of auricular tie-over and missed bleeders in surgical field respectively. They were found early and then cured after adequate incision and drainage.

Diabetes mellitus, heavy smoking, connective tissue disease, scleroderma, rheumatoid disease, systemic lupus erythromatosus, relapsing polychondritis, sarcoidosis, Wegener's granulomatosis, and keloid formation are contraindications for rhinoplasty because they must influence the quality of cartilage graft and the healing of wound [1,8] The previous autogenous grafts can be reused after the scar tissue is cleaned. If they are insufficient, we harvest more septal cartilage from nasal septum despite it has denoted some cartilage in primary surgery. But 1cm safe margin should be preserved in the anterior and superior margin of septum to keep an intact L strut, so as to prevent saddle nose or further columellar retraction in the future. Or we harvest a fresh cartilage graft from auricle or rib. If the 3 sites mentioned above cannot donate enough grafts, or a patient hesitates to be harvested fresh autogenous grafts, an artificial graft is recommended. For example, case 7 and 13 underwent revision rhinoplasty with Medpor augmentation. However, 2 cases, case 11 and 18 with dislocation of previous Medpor and silicon graft (figure 3) respectively, were tenacious of their opinion to reuse the troublemaking artificial grafts despite of our advisement. Case 18's nostrils were a little asymmetric after surgery (figure 3D). Therefore, L shape silicon grafting is discouraged. If necessary, we encourage other new-developed artificial grafts, such as expanded polytetrafluoroethylene (GoretexR) [9] or AlloDerm (Cymetra) [10], but the patient should be informed of the risk adequately, so as to prevent the possible argument in the future.

CONCLUSION

Revision rhinoplasty is more difficult than

primary rhinoplasty. The operator not only deals with the possible anatomical variation caused by the previous surgery, but also meets the expectation of the patient. A better operative field can be achieved in an open approach. The most challenge is unclear anatomies and scar tissues in revision rhinoplasty. The previous autogenous cartilage grafts can be reused after the scar tissues are cleaned. If they are insufficient for revision, autogenous cartilages from nasal septum, auricles, or ribs are preferred.

REFERENCES

- 1.Murrell, George L: Auricular cartilage grafts and nasal surgery. *Laryngoscope* 2004;114:2092-102.
- 2.Kao CH, Wang HW, Lee JC, et al: Use of porous high-density polyethylene (Medpor, nasal shell) in rhinoplasty. *J Taiwan Otolaryngol Head Neck Surg* 2003;38:S18-21.
- 3.Chen JJ, Kao CH, Hsiao YC, et al: Application of auricular cartilage graft in open rhinoplasty. *J Taiwan Otolaryngol Head Neck Surg* 2005;40:19-25.
- 4.Kao CH, Wang HW: Open rhinoplasty. *J Taiwan Otolaryngol Head Neck Surg* 2003;38:153-60.
- 5.Vuyk HD, Watts SJ, Vindayak B: Revision rhinoplasty: review of deformities, aetiology and treatment strategies. *Clin Otolaryngol Allied Sci* 2000;25:476-81.
- 6.Bagal AA, Adamson PA: Revision rhinoplasty. *Facial Plast Surg* 2002;18:233-44.
- 7.Yoder MG, Weimert TA: Antibiotics and topical surgical preparation solution in septal surgery. *Otolaryngol Head Neck Surg* 1992;106:243-4.
- 8.Holt GR, Garner ET, McLarey D: Postoperative sequelae and complications of rhinoplasty. *Otolaryngol Clin North Am* 1987;20:853-76.
- 9.Godin MS, Waldman SR, Johnson CM Jr: Nasal augmentation using Gore-Tex. A 10-year experience. *Arch Facial Plast Surg* 1999;1:118-21; discussion 122.
- 10.Gryskiewicz JM, Rohrich RJ, Reagan BJ: The use of alloderm for the correction of nasal contour deformities. *Plast Reconstr Surg* 2001;107:561-70; discussion 571.

修正性鼻整形術

陳建志¹、陳登郎²、高全祥³、王興萬³

行政院衛生署桃園醫院 耳鼻喉科¹

吉豐耳鼻喉科診所²

國防大學三軍總醫院 耳鼻喉頭頸外科部³

摘 要

- **目的：**修正性鼻整形術是顏面重建手術中最具挑戰性手術之一，因先前的手術增加了手術的困難度，必須要能正確診斷需矯治的變形，重建鼻內部支撐結構及外覆皮膚軟組織。
- **材料及方法：**收集自2001年10月至2005年2月間，在北部某醫學中心施行修正性鼻整形手術案例，共有27名，其中男性24名，女性3名，平均年齡27歲(介於20~56歲)，含病患的性別、年齡、病因、過去曾接受過的治療及手術。手術原因為病患自覺未達理想鼻形 (n=16)及人工異體填充物或自體移植物的併發症 (n=11)。主要手術步驟手術路徑皆採鼻小柱中間倒V字形及兩側邊緣切口之開放式路徑，包括採用耳殼軟骨、鼻中隔軟骨及肋軟骨等自體軟骨移植植物 (n=18)，採用新的人工異體填充物 (n=4)，及僅以開放式路徑行切骨術，將之前的鼻部軟骨及移植植物做相關的調整或移除 (n=5)。
- **結果：**術後併發鼻中隔血腫及耳殼血腫各有1名，均皆接受清創引流手術治癒。追蹤迄今，除2名對外觀改善不滿外，整體滿意度高達93% (25/27)，無殘留鼻塞等功能性的問題。
- **討論：**修正性鼻整形術因手術中解剖構造不清及疤痕組織，較初次的鼻整形術困難。術前需取得病人及醫師雙方對治療方法的共識，手術以有較佳的視野的開放式路徑，可提高成功率。

關鍵字：移植植物，修正性鼻整形術，鼻整形術