

개방 코성형술에서 톱을 이용한 외절골술

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Lateral Osteotomy with Sawing Technique in Open Rhinoplasty

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Purpose: Lateral osteotomy is an essential step in the correction of nasal bony asymmetry. Direct visualization allows accurate repositioning of the nasal bones compared to blind techniques, which require precision and manual dexterity. We propose direct visualization procedures in open corrective rhinoplasty.

Methods: The technique was used on 16 patients. All patients underwent open rhinoplasty with a columellar incision. The marginal incisions were extended on either side to allow access to the piriform aperture. A double hook was used to caudally retract the lower lateral cartilages and the fibrous connections between the upper and lower lateral cartilages were released until the piriform aperture was visualized. Through the incision, lateral osteotomy was performed using a reciprocating saw at that time with direct visualization. Additional procedures including augmentation rhinoplasty, hump resection, septoplasty and tip plasty were performed simultaneously.

Results: This method provided excellent exposure to the lateral nasal bones and allowed the lateral osteotomy to be carried out precisely using the reciprocating saw.

Conclusion: This extended open rhinoplasty method is suitable for most individuals, allowing a wide surgical field.

Key Words: Corrective rhinoplasty, Reciprocating saw, Open rhinoplasty, Septoplasty

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I. INTRODUCTION

Lateral osteotomy is a key step in the correction of nasal bony asymmetry and deformities. A range of methods have been employed in this procedure, including blind percutaneous, transnasal approaches, endoscopic transnasal and intraoral approaches.¹⁻⁶ Direct visualization allows more accurate repositioning of the nasal bones than blind techniques, which require precision and manual dexterity.² This, we think, is a skill that is acquired only through surgical experience. We present a simple technique that allows direct visualization and can be carried out using an open rhinoplasty approach.

II. IDEAS AND INNOVATIONS

A. Patients

From May 2007 to July 2009, this technique was applied to 16 patients. Eleven cases underwent a correction of post-traumatic deformities, and 5 cases underwent surgery to correct a broad bony vault (Table I).

B. Methods

A transcolumellar, V-shaped incision was performed for skin flap elevation. The marginal incisions were extended 6~7 mm compared to the conventional open rhinoplasty technique on either side to allow access to the piriform aperture. Rhinoplasty proceeded in the usual manner with exposure of the upper and lower lateral cartilages. Once the nasal dorsum was reached, the dissection proceeded subperiosteally up to the nasofrontal suture. A double hook was used to retract the lower lateral cartilages caudally, and the fibrous connections between the upper and lower lateral cartilages were released until the piriform aperture was visualized (Fig. 1). This maneuver yielded a global view of the nasal bones and cartilages. The extended marginal incision is essential to give the reciprocating saw sufficient access. Further extension of the incision was made laterally to sustain

Table I. Patients' Details

Case	Sex	Age	Prior surgery	Diagnosis	Additional procedures
1	M	24	Closed reduction Corrective rhinoplasty	Deviated nose, hump Asymmetric nostril	Augmentation rhinoplasty with diced conchal cartilage wrapped in temporalis fascia, septoplasty, tip plasty, hump resection Columellar strut graft with septal cartilage
2	F	20	None	Wide bony vault	Augmentation rhinoplasty with silicone implant Tip plasty
3	M	30	Closed reduction	Deviated nose	Septoplasty
4	M	22	Closed reduction	Deviated nose, hump	Septoplasty, tip plasty, hump resection Septal derotation graft with septal cartilage
5	M	33	Closed reduction	Deviated nose, hump	Hump resection
6	F	18	Closed reduction	Deviated nose, hump	Septoplasty, tip plasty, hump resection Septal derotation graft with septal cartilage Tip plasty
7	M	27	Closed reduction Corrective rhinoplasty	Deviated nose, hump	Septoplasty, tip plasty, hump resection
8	F	23	Corrective rhinoplasty	Wide bony vault Hanging columella	Augmentation rhinoplasty with silicone implant Septoplasty, tip plasty Septal derotation graft with septal cartilage
9	M	20	Closed reduction	Deviated nose, hump	Hump resection, tip plasty, septoplasty Columellar strut graft with hump cartilage
10	M	45	Closed reduction Corrective rhinoplasty	Deviated nose, hump	Hump resection Septoplasty
11	F	36	None	Deviated nose, hump	Hump resection Septoplasty, tip plasty
12	F	29	None	Wide bony vault	Augmentation rhinoplasty with silicone implant Tip plasty
13	M	28	Closed reduction	Deviated nose, hump	Hump resection, septoplasty
14	F	25	None	Wide bony vault, hump Short columella	Augmentation rhinoplasty with silicone implant Hump resection, tip plasty, septoplasty Columellar strut graft with septal cartilage
15	F	45	Closed reduction	Wide bony vault	Augmentation rhinoplasty with silicone implant Septoplasty, tip plasty
16	M	22	Closed reduction	Deviated nose, hump	Augmentation rhinoplasty with diced conchal cartilage wrapped in temporalis fascia, septoplasty, tip plasty, hump resection Columellar strut graft with septal cartilage

the inadequate space.

At this point, tumescent infiltration with lidocaine into the nasal mucosal lining under the nasal bones was performed. A surgical pencil was used to outline the precise location of the osteotomy on the nasal bone. The cutting line was designed as a low-to-high osteotomy line. The reciprocating saw was oriented precisely and the lateral osteotomy was then completed. Sawing was performed

as complete cutting without the use of a manual force. Paramedian osteotomy was performed using the reciprocating saw. The nasal bones were then repositioned. When septal deviation was present, a septal resection was performed and a 12-mm L-strut was saved to prevent nasal collapse. Septal or conchal cartilage was used when cartilage was desirable as a strut or shield graft. If necessary, augmentation procedures were performed in

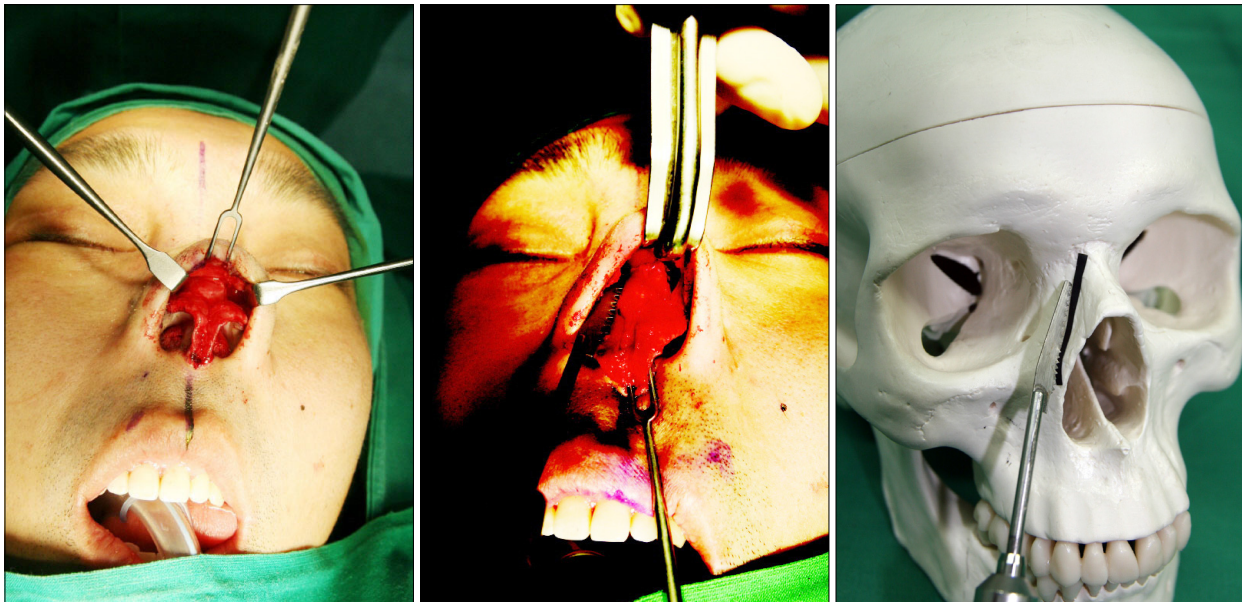


Fig. 1. (Left) The marginal incision of nostril was extended for a wider surgical field. (Center) Lower lateral cartilages was detached from the upper lateral cartilage, and de-rotated in a caudal direction. (Right) Schematic view for the position of the reciprocating saw.

the subperiosteal plane using a silicone implant or a diced cartilage graft wrapped in temporalis fascia. Further procedures were then performed as required.

As a conventional splint was not used for postoperative management, a round paper roll was placed externally alongside the lateral osteotomy for seven days. The E5 patient self satisfaction scale was used to evaluate the patients' postoperative satisfaction (from excellent to poor).⁷

C. Results

Nine patients were male, and 7 patients were female. The patients' ages ranged from 18 to 45 years (mean age, 27.9 years). The main causes of the deviation are included trauma (11 cases), and wide bony vault (5 cases). Secondary corrective rhinoplasty was performed in 4 patients who had undergone previous corrective surgery at other local clinic (3 patients with posttraumatic deformities and 1 patient with a broad bony vault). All trauma patients experienced a closed reduction for the nasal bone fracture. Seven cases of augmentation rhinoplasty were performed simultaneously. Two male patients who required augmentation rhinoplasty with autogenous materials underwent augmentation rhinoplasty with diced conchal cartilage wrapped in temporalis fascia, and 5 patients with a wide bony vault were augmented with silicone implant. Nine hump resections were carried out. Septoplasty was performed

simultaneously in 13 cases. Table I lists detailed information of the additional procedures.

There were no postoperative complications during the mean postoperative follow-up period of 6 months. The patients' postoperative satisfaction was good to excellent.

D. Case references

Case 1

A 30-year-old man involved in a road traffic accident sustained a panfacial fracture. He underwent an open reduction, internal fixation of his facial bone fractures and closed reduction of the nasal bones. On the follow-up in 4 weeks, there was still a severely deviated nose. Corrective rhinoplasty with septoplasty was performed (Fig. 2).

Case 2

A 28-year-old man suffered from severe nasal bone deviation. The patient wanted to correct the deviation and augment his nasal dorsum simultaneously. Corrective rhinoplasty with septoplasty was performed. Augmentation rhinoplasty with diced conchal cartilage wrapped in temporalis fascia was also performed.

Additional procedures included tip plasty, hump resection and a columellar strut graft with septal cartilage (Fig. 3).



Fig. 2. (Left) Preoperative view of a 30-year-old man who had a severe deviated nose. (Right) Postoperative view 6 months later.



Fig. 3. (Left) Preoperative view of a 28-year-old man who had a severe deviated nose. (Right) Postoperative view 2 months later.

III. DISCUSSION

Although lateral osteotomy is a common procedure in conventional rhinoplasty, unsatisfactory results are encountered occasionally, even with an experienced surgeon.^{2,5} Lateral osteotomy is a procedure with a steep learning curve. A range of approaches have been used to overcome this, occasionally leading to less than ideal results. The use of numerous methods highlights the lack of an ideal method for all patients. The initial methods included "blind" techniques either via the transnasal or percutaneous route.

The transnasal route is a disadvantage as it requires experience and an estimation of the osteotomy line. Rohrich et al. proposed an external perforated lateral nasal osteotomy to overcome the pitfalls of conventional "blind" techniques.^{1,5} It preserves the support of the periosteum, reduces the lateral nasal wall collapse and minimizes hemorrhage and edema. However, the complications include nasal asymmetry and external scarring, which is a major concern in young Oriental women who are prone to hyperpigmentation and hypertrophic scarring. Other methods include visualization of the nasal bones because some surgeons still experienced difficulty in

controlling the osteotome. The endoscopic transnasal route espoused by Park et al.³ was fraught with problems associated with maneuvering the camera and osteotome within a tight pocket. This frequently led to delays and was associated with more complications as reiterated by the author. The intra-oral approach described previously by our author² required separate access. This is associated with the possible risk of infection via the oral passage, even though the endoscope could now be manipulated better in a larger surgical field.

The "blind" techniques and transnasal endoscopic-assisted method employ hand held osteotomes, which can give rise to irregular bony edges. The reciprocating saw had the advantages of being fast, able to achieve symmetric cutting and regular bony edges by changing the sawing angle.²

Giampapa and DiBernardo described the use of the reciprocating saw⁶ to access the piriform aperture via an external approach. They used a large two dimensional saw blade that required large access. Their technique was a "blind" procedure that could potentially injure the nasal lining.

Conventional "blind" osteotomes often injure the nasal mucosa, which often requires a subperiosteal dissection of the nasal mucosa. The soft tissue, including nasal mucosa, cannot be cut if gentle and precise application of the reciprocating saw in cutting the bone is performed. In this series, there were no nasal mucosal injuries, and it is believed that the hyperinfiltration of local anesthesia on the nasal lining is sufficient to prevent injury.

The open rhinoplasty approach is preferred for the management of a deviated nose, which usually requires a restoration of the septal component. An open rhinoplasty provides an excellent view of the intranasal anatomy, allowing for cartilage and septal work to be performed.⁸ Additional procedures including tip plasty, septoplasty, augmentation rhinoplasty and hump resection can be performed simultaneously for better aesthetic results. The upper and lower lateral cartilages often need to be detached to effectively introduce the reciprocating

saw. This technique precludes the need for further access incisions for lateral osteotomy.

Long marginal incisions might cause contracture deformity of the nostril. Hence, accurate apposition of the suture margins in the nostril is important. Gentle manipulation is required during the limited detachment of the lower lateral cartilage from the upper lateral cartilage to allow for de-rotation and a wider field. However, this technique is unsuitable for individuals with very small nostrils.

The extended open rhinoplasty method is well suited for most individuals and allows a wide surgical field. This method provides excellent exposure to the lateral nasal bones and allows lateral osteotomy to be carried out precisely with reciprocating saw. This method is a simple, fast and effective alternative to a lateral osteotomy.

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