Slimming of Lower Face by Contouring of the Mandibular Body in Orthognathic Surgery Patients

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Abstract

The patient’s appearance can be dramatically enhanced as a result of orthognathic surgery. However, esthetic contouring of the mandibular body portion is often overlooked in the surgery. Restoring a more beautiful jaw line is important and directly affects surgical results. From December 2010 to February 2012, we performed mandibular body contouring for the slimming of the third lower part of the face in 37 patients who had undergone either 1-jaw surgery or 2-jaw surgery. The third lower part of the facial contour was improved in all the patients after at least 3 months follow-up. Mandibular body contouring is a simple method that can be additionally used for the slimming of the third lower part of the face in patients who require orthognathic surgeries. It makes the lower face look more attractive from both the anterior and lateral perspectives.

Key words: Orthognathic surgery, Mandibular contouring

Introduction

Orthognathic surgery or corrective jaw surgery involves the surgical manipulation of the elements of the facial skeleton to restore the proper anatomic and functional relationship in patients with dentofacial skeletal anomalies. Although the surgery is originally performed to improve the jaw function through correction of the gross jaw discrepancy, such as anteroposterior, vertical and/or transverse discrepancies of maxilla and/or mandible, some patients also experience considerable enhancements to their appearance[1-3].

Recent trends in facial contouring surgery are to make the size of the face smaller, the contour line of the face smoother and slimmer. The most frequently used facial contour surgeries are performed at the lower part of the face. These operations narrow the bottom part of the face to reshape the facial contour into the ideal oval or egg shape. For correction of the prominent mandible and square contour of the face, in the past, the surgery just resects the mandibular angle. However, mandibular body ostectomy is necessary in addition to resecting the mandible angle so that the width of lower jaw can be narrowed more[4-7].

Although orthognathic surgery is primarily indicated whenever the deviation in skeletal relationships becomes...
severe enough to be functionally handicapping and cannot be resolved by dental procedures, it may not achieve ideal facial appearance that correcting the skeletal deformity until a certain ideal occlusal relation was achieved[8]. No less than ideal maxillar-mandibular jaw relation, the attractive and beautiful face has been a major focus in orthognathic surgery patients in Korea and in many other Asian countries. To achieve this, ostectomy of the lower part of mandibular ramus, including the gonial angle portion, is usually included to the mandibular bilateral sagittal split ramus osteotomy (BSSO). Although it is a simple method, this method can result in reduction of the mandibular width, from the frontal view, through the removing the half-thickness of the outer cortex of the mandibular ramus[9,10]. Nonetheless, in some patients, the resection of the lower part of mandibular ramus may be somewhat lacking in making the slender face. In addition to the resection of the lower part of mandibular ramal portion, a further procedure may be needed to make a small and slim face in orthognathic surgery patients.

In any case of dentofacial deformity, because the perfect intermaxillary relation through correction of the underlying skeletal problem has been the primary goal of the orthognathic surgery, a mandibular body contouring procedure is rarely incorporated into treatment planning in the meantime. To create a slimmer facial contour, we integrated mandibular body contouring to make a slim and delicate jaw line in orthognathic surgery.

Case Report

1. Patients

Thirty-seven patients who had surgical correction of dental and skeletal Class III malocclusion and mandibular prognathism from December 2010 through February 2012 were reviewed in this study. Data were obtained from patients, with informed consent, as required by the ethics committee of Gyeongsang National University Hospital. All surgical corrections for mandibular prognathism involved the 1-jaw surgery (BSSO) or 2-jaw surgery (LeFort I maxillary osteotomy and BSSO). Whenever required, genioplasty or para-nasal augmentation with autologous bone graft was performed. Autologous bone for grafting was harvested from BBSO and mandibular body contouring procedures. Rigid fixations were used to immobilize the bony segments for both jaws.

2. Surgical technique

The 2-jaw patients underwent BSSO of the mandible

![Fig. 1. (A) Marking of the resected portion of proximal segment. (B, C) The lower portion of proximal segment is resected with reciprocating saw.](image)
and posterior impaction of the maxilla with LeFort I osteotomy. The maxilla was rotated in a clockwise manner at the center of rotation between the anterior nasal spine and the upper incisal tip, which resulted in posterior impaction. The 1-jaw patients underwent mandibular setback surgery with BSSO. BSSO of the mandible was performed with a short lingual osteotomy method for enhanced stability. When performing BSSO, once the mandible is divided into the proximal segment including mandibular ramus and distal segment including mandibular body, the lower part of mandibular ramus including the gonial angle portion was resected with a reciprocating saw under direct vision after antero-superior traction of the proximal segment with a Kocher clamp (Fig. 1). Whenever required, resected bone was used for procedures of autologous bone grafting such as augmentation genioplasty or paranasal augmentation. After predicted positioning of distal segment using a prefabricated splint, fixation is done with bicortical screws. For mandibular body contouring, the chin and mandibular body were exposed through the degloving procedure, and the mental nerve was dissected and carefully protected. The starting point of the osteotomy is the inferior portion of posterior outer cortex of mandibular body portion. The end point of the osteotomy is the point where the vertical line from canine meets the edge of the mandible. The full thickness of the inferior portion of the mandibular body was resected with a reciprocating saw. The important point in the procedure is the osteotomy located usually 3 mm below the mental foramen. The bones below the osteotomy lines were removed, and the edges of the lower borders were contoured with a bone file (Fig. 2).

There were no complications such as unexpected fracture or severe injury of the mental nerve. All patients reported transient sensory disturbance of the lower lip, which was nearly all recovered by 6 months postoperation. The mean follow-up period was 5.6 months (range, 3～9 months). The lower facial contour of all patients significantly improved from both frontal and lateral projection. Slender and smooth jaw line was obtained in all patients. However, in three cases, the patients were not fully satisfied with the unstable postoperative occlusal states (Fig. 3～6).

**Discussion**

In recent times, the young generation prefers their face to be slender and oval with smooth curves and outlines in Korea and many other Asian countries. Reflecting the current trend in esthetic surgery, facial contouring surgery is being undertaken to make the face appear smaller and

![Fig. 2. (A) Marking of the resected portion of mandibular body. (B, C) The lower portion of mandibular body is resected with reciprocating saw.](image-url)
more delicate in various ways. Multi-stage curved osteotomy, mandibular outer cortex ostectomy with mandibular V line ostectomy, inclined-fullness mandibular reshaping, or narrowing genioplasty with additional resection of the lower mandibular border to the angle is being performed for correction of prominent and square lower face, instead of simple mandibular angle resection[6,11-13]. We included this kind of additional esthetic procedure for slim and slender face in orthognathic surgery.

Orthognathic surgery combines orthodontic treatment with surgery of the jaw to establish a stable, functional balance between the teeth, jaws, and facial structures. The goals of maxillofacial surgery are to ensure proper jaw and teeth function and improve facial appearance. In addition, orthognathic surgery accompanied by some additional
procedures can effectively provide more attractiveness to the face. Actually, the lower part of the proximal ramal segment is usually resected for more esthetic results during BSSO. The removal of the lower part of the proximal ramal segment provides a slim and slender face, by reducing the lateral projection of the lower face[9,10]. Although the inner cortex portion of the distal segment including mandibular body remains after the resection of the lower part of the mandibular ramal portion, there is little effect on facial appearance, from the frontal and lateral view. After the removal of the ramal portion with reciprocating saw, the resection the inner cortex portion of the mandibular body with oscillating saw is also not easy technically. It is also known that the resection of the mandibular ramal portion including gonial angle reduces the tendency of postoperative skeletal instability by means of shortening
the pterygomasseteric sling[9]. However, in some patients, the partial resection of the mandibular ramal portion alone does not make the face appear slender in orthognathic surgery. Sometimes the procedure may leave residual square body. Considering the mandibular ramus and body as one esthetic unit, therefore, besides the resection of the lower part of the proximal ramal segment, the contouring procedure of the distal mandibular body segment may be needed for slimmer face in orthognathic surgery.

In addition to the ostectomy of the lower part of mandibular ramus, we performed the technique of mandibular body contouring, and achieved significant improvement of the lower facial contour in orthognathic surgery patients. The full thickness of the inferior portion of the mandibular body was resected with a reciprocating saw, and the edges of the lower border and the junction portion with remaining inner cortex portion of the mandibular body was contoured with bone file. There were no cases of permanent numbness of the lower lip. During the mandibular body contouring, the osteotomy line must be located at least 3 mm below the mental foramen.

In conclusion, this study suggests that the face appears more slim and harmonious by reducing lower facial width, via a simple method, often overlooked, that the outer cortical bone mandible ramus and complete cortical bone of inferior portion of the mandibular body are resected in orthognathic surgery.

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References