

Treatment of Canted Mandibular: A Case Report

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Abstract: Orthognathic surgery has an objective to repositioning the basal bone in the framework of maxillo-mandibular deformities that results both in esthetic and functional. It could improve the stability of dental occlusion, temporomandibular joint (TMJ) function and facial proportion in patient with skeletal occlusion disruption. Patient with skeletal occlusion disruption of lower third facial could be treated with Bilateral Sagittal Split Osteotomy (BSSO) technique. This article aimed to report the management of canted mandible with orthognathic surgery. A 19 years old male patient complaining his lower jaw tilted to the right. He feels fatigue on his facial muscles and jaws when chewing in long period of time, and soreness on his shoulders through to the lower back area, buzzing ears and clicking in both of TMJ. The patient treated with BSSO procedure to correct the skeletal disruption. The mandible was autorotated and set back to reach class I occlusion. BSSO technique in patient with canted mandibular to alter the shape of the jaw found to be effective to overcome functional and esthetic problem of the patient.

Keywords: BSSO, canted mandibular, occlusal disruption

1. Introduction

Dentofacial deformities have a major negative social impact because of its association with esthetic and functional limitations which can be drastically modified using orthognathic surgery. During recent decades, orthognathic surgery has become widely accepted as the preferred method of correcting moderate-to-severe skeletal deformities. Deformities of the jaws resulting misalignment of the teeth create functional and aesthetic difficulties for patients.^{1,2,3}

Orthognathic surgery has an objective to repositioning the basal bone in the framework of maxillo-mandibular deformities that results both in esthetic and functional defined. This treatment acted as a jaw arrangement to improve the relationship between the jaw and surrounding tissue within a craniofacial complex. It is performed to alter the shape of the jaws to improve dental occlusion stability, improve temporomandibular joint function, open the oropharyngeal airway, and improve the patient's facial proportions. In order to get a great results, surgery must be coordinated with orthodontic treatment. Growth discrepancies can occur in either the maxilla or mandible. Understanding of dental occlusion, facial growth, functional gnatology and facial aesthetics is essential in the success of care.^{1,2}

The mandibular deviation is associated with vertical asymmetry such as asymmetry at the maxilla and frontal angle. Asymmetrical functionalities in the temporomandibular joint (TMJ) are an important contributing factor in temporomandibular joint disease (TMD). Patients with mandibular deviations also have asymmetry functionally and asymmetrically morphologically. The mandibular deviation is closely related to the direction of the condyle, which will lead to the non-

deviation side during protrusive movement and maximal opening and closing of the mouth. Therefore, functional changes are important in addition to morphological changes after orthognathic surgery.^{3,4}

Patient with skeletal occlusion disruption of lower third facial could be treated with Bilateral Sagittal Split Osteotomy (BSSO) technique to correct mandibular. The advantage of BSSO technique is that it can reverse and advance the mandibula more than 10 mm, while the shortage is requiring additional cost for plate installation.^{1,2}

2. Case Report

A 19 years old male patient came to Universitas Padjadjaran Dental Hospital in Bandung, Indonesia with chief complaints of facial asymmetry. His lower jaw tilted to the right. He feels fatigue on his facial muscles and jaws muscles when chewing in long period of time, and soreness on his shoulders through to the lower back area. He also have a history of buzzing ears and clicking in both of TMJ when yawning or open mouth too wide.

Extra oral examination showed an asymmetrical facial profile with a deviation of lower jaw both in vertical and horizontal courses. Intraoral examination showed a class II relation on the right and class III relation on the left with edge to edge incisal relation. The posterior was crossbite on the right side. Dental midline between the upper jaw and lower jaw was not aligned, whereas the mandibular midline shifting to the right as much as 3 mm [Fig. 1]. During examination, asymmetric movements of the bilateral condyles were observed. There was limited range of motion of the left condyle during opening and closing, and protrusive and lateral excursive movements.



Figure 1: Pretreatment facial profile and intraoral view

The orthopantomogram showed the right condylar neck was relatively shorter than the left. The posteroanterior cephalogram showed mandibular deviation to the right and a

canted occlusal plane, with shorter ramus height on the deviated side [Fig. 2].

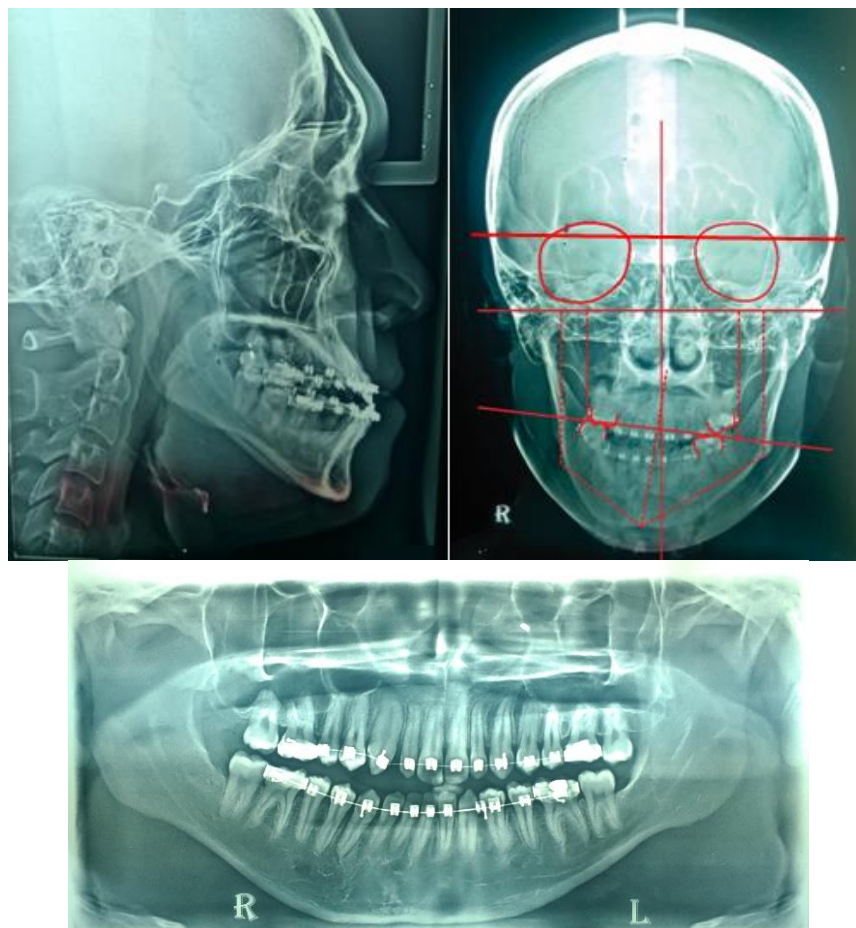


Figure 2: Pretreatment cephalometric and OPG radiographs

Wisdom teeth of the lower jaw has been removed 2 years earlier. This patient has been treated by orthodontist for approximately one year for alignment and levelling as the preparation for orthognathic surgery.

Surgery was performed on patient with an intra oral approach under general anesthesia. Local hemostatic injections were performed with 1: 200,000 adrenaline around the incision line, installation of mouth gag on the lateral side of the comb, retractor cheek and tongue spatula to obtain sufficient operating field. With a long handle scalpel, the incision is made on the soft tissue as high as the retromolar trigonum starting from the medial with deep mucosal incisions then deeper to the periosteum at the anterior margin of the ascendent ramus to the first molar and extended laterally to the second molar. The soft tissue is separated by the bone using Williger's raspa to get the lower border of the mandibular bone followed by the placement of a large Obwegeser's retractor and retractor retractor retractor then Langenbeck V-shaped retractor ram placed on the front of the ramus border to the base of the coronoid process to obtain a larger area. Forcep Cryle toothed is used after the retractor is removed.

Ash instrument number 6 is used to determine the location of the sigmoid notch traced from the lateral and toward the medial to identify the mandibularis nerve foramen. When

horizontal grinding was performed, Williger's raspa is placed on the fovea near the foramen at an angle of 45 ° to protect the neurovascular bundle.

Bone grinding is also performed on the lateral portion of the mandibular corpus up into the bone cortex by using medium size Lindemann bur. The location of bone grinding is horizontal and vertical connected with reciprocating saw as deep as 7 mm toward the cancellous bone to prevent the possibility of damage to the neurovascular bundle. Separation of bone followed by Williger's raspa and bone separator placed in the middle and 1/3 anterior at the vertical bone with a depth of 5-10 mm.

The same measures was done on the other side, then all the instruments were removed, the distal and proximal parts were mobilized with one hand to place the anteroposterior position. Furthermore, the maxillary and mandible were occluded using the wafer following the occlusion pattern on the model. The intermaxila fixation was performed with the left and right posterior power chain of the orthodontic bracket, then manipulated of the condyle position at the centric position above and the center of the glenoidal fossa, and fixation of the plate and screw on the left and right, followed by spooling 0.1 NaCl solution % and suturing.



Figure 3: A. Separation of mandibular bone, B. Reposition of mandible and maxilla, C. Fixation of intermaxila with power chain, D. Fixation with plate and screw

First day follow up after surgery, the patient still complained of nausea and dizziness as the side effect of general anesthesia. Clinically there was swelling at both of cheek and angle regions of lower jaw. Intraorally, there was no blood seepage on post surgical site. The occlusion was centric, open bite was seen. Elastic bands was placed on the second day after surgery as a guide to reach contact

occlusion and to guide the patient's bite during the healing process, also as a compensation for postoperative swelling that tends to shift the patient's bite, and seat the TMJs. The patient complained of the elastic bands placement makes eating and drinking was difficult for the patient. Even though the was diet liquid and blended.

Paresthesia of mentalis nerve was noticed since day one after surgery. The patient was given antibiotic, analgetic and anti inflammation. Oral hygiene was maintained and surgical wound site was treated with triamcinolone acetoneid ointment twice daily.

On day seven after surgery, the paresthesia persist, the swelling decreased, molar occlusion at class I Angle and patient feel more comfort with the facial appearance [Fig. 4].

On 2 weeks after surgery OPG showed a good occlusion. The soreness on his shoulders and lower back has subside and completely dissapeared. Since the occlusion has set to normal relation, it was affected directly to patient's facial profile which showed aligned jaw relation and shorter facial profile. There was no mouth opening problems, there was no additional mandibular deviations when the patient open or closing his mouth.



Figure 4: Post operation day 7

3. Discussion

Disharmony of the lower third is imperative that management of these anomalies includes surgery of the mandible and/or of the chin area. Latero-mandible; with the mandible displaced toward one side and canted occlusal plane, there is usually a discrepancy between upper and lower midlines. This type of problem requires unilateral or bilateral osteotomy, sometimes associated with osseous adjustment of the chin area^{4,5}

Various techniques are used for correction of skeletal occlusion disruption. In patients with cantedocclusal plane and mandibular deviation Vertical Ramus Osteotomy (VRO) and BSSO are the most common. In general, both techniques aim to correct the angle of the mandibular problem with the cranial bone. In severe deformity, the ramus osteotomy may be combined with osteotomy in the chin or alveolar. Advantages of VRO technique when compared with BSSO technique, such as trauma to minimal nerve bundle, shorter operation time, minimal bleeding risk, and does not require plate and screw so the cost is more minimal. While BSSO technique advantage is able to setback or advancement more from 10 mm and does not require intermaxilla fixation.^{5,6,7}

A case of laterognathi skeletal mandibular dextra has been reported and treated with orthognathic surgery with Bilateral Sagittal Split Osteotomy (BSSO) technique, show satisfactory results even though the complicating factor of impaired motor control function may affect success in correcting laterognathi skeletal mandibular dextra.^{6,7}

BSSO General Description

BSSO technique, first introduced by Obwegeser and Trauner in 1957, and became popularly used to correct prognathi disorders to date. This technique is done with intraoral approach and can be setback or advancement more than 10 mm, but its drawback compared to VRO is require plate.^{2,4}

Bilateral Sagittal Split Osteotomy (BSSO) aims to advance the mandibular so that the mandibular plane is very important. Counterclockwise or anterior rotational movement the mandibular position is less stable resulting in frequent relapse, as well as progressing the mandible more than 10 mm. But if the mandibular plane is parallel to the initial position or the clockwise movement towards the posterior rotation, it can provide a stable position.^{2,4}

A major disadvantage of this technique is that it can damage the mandibular neurovascular bundle that conserves the

lower lip and chin. This needs to be conveyed to the patient if some time found sense of numbness in the lower lip and chin for several weeks or months after surgery. The advantage of this technique can be used by plates and screws to allow not to use intermaxilla fixation, and jaw joint complaints are rare. Impact third molar teeth are recommended to be removed at least 6 months in advance to achieve maximum bone healing before orthognathic surgery. This is done to facilitate the sagittal split osteotomy and fixation of the screw.²Complications that may occur in this technique are bleeding, parastesis due to trauma to the inferior alveolar neurovascular bundle, swelling, infection, unanticipated bony split, relapse, airway disturbance, non-union (inadequat closure).^{4,5}

4. Conclusion

Orthognathic surgery is a measure for correcting abnormal facial proportions by combining orthodontic treatment and jaw surgery. BSSO technique in patient with canted mandibular to alter the shape of the jaw found to be effective to overcome functional and esthetic problem of the patient.

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