

## CONSERVING THE CENTRIC RELATION POSITION OF CONDYLAR HEAD WITH MINI-HOFFMANN SETS IN VERTICAL RAMUS OSTEOTOMY

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*Several authors have proposed techniques and devices by which the correct position of the proximal segment can be maintained both during fixation and postoperatively. Schendel, Epker, Lake, Worms, Ive and Poulton have been discussed the problem of condylar distraction in mandibular orthognathic surgery.*

*This study described have showed the some advantages forward repositioning of the condyle head in vertical ramus osteotomy which used with the Mini - Hoffmann sets in external skeletal pin fixation extraorally in 19 cases.*

### I. INTRODUCTION

The treatment of maxillofacial deformities has improved in recent years, but relapse for these results has widely approached for many authors.

There are suggesting factors as contributing to relapse following mandibular orthognathic surgery ; lack of controlled repositioning of the proximal segment at the time of surgery, observed alterations in postoperative occlusion, type of fixation method(due to lack of stability of the proximal segment during the healing period), and form or degree of surgical corrections<sup>2,6)</sup>.

Condylar displacement during surgery appears to play an important role in the stability of mandibular orthognathic surgery<sup>1,17,20)</sup>. But there are few studies documenting its effects a condylar position.

Several authors have proposed the techniques associated with the proper position of the proximal segments of the mandible during fixation in the sagittal split ramus osteotomy of the mandible. Leonard (1976)<sup>10)</sup>, Zecha(1978)<sup>21)</sup>, Naumann(1980)<sup>13)</sup>, Luhr (1986)<sup>11)</sup>, Hefez(1987)<sup>3)</sup>, Raveh<sup>21)</sup> & Hiatt(1988)<sup>4)</sup>, and Cho(1987)<sup>22)</sup> have addressed techniques to repositioned the proximal segment of rami of the mandible

which applied to the maxilla.

The extraoral approaches to the ramus of the mandible was the preferred techniques when a large amount of retrusion or lengthening of the mandibular ramus is necessary, uncommonly mouth is very small and inelastic, or when visualization is restricted because of extreme bowing of the vertical rami.

So, I have gained the some advantages to repositioning the proximal segment of the mandibular rami in vertical ramus osteotomy in 19 cases among the 51 cases which treated with orthognathic surgery from Feb. 1987 to Jun. 1990 in CAFGH which indicated to the extraoral approaches by using of Mini - Hoffmann sets in external skeletal pin fixation mainly used in orthopedic department.

### II. TECHNIQUE

The method have employed in extra - oral vertical ramus osteotomy which mainly indicated to severe mandibular prognathism and facial asymmetry.

Preoperatively, we developed a plaster head cap that is located above the eyeblow which measured to 7-8cm width. This cap involves the rigid rods both side placed anterior to the ala - tragus(Fig. 1,



Fig. 1, 2. The patients has received the plaster head cap involving rigid rods ; left side (frotal view), right side(lateral view).



Fig. 3. Kirchner wire has drilled on the proximal segment parallelly.

2). This rods should resist the minor movement during adaptation and particular attention must be paid not to broen the head cap margin by moving rigid rods.

The surgical procedure begins with the routine approaches via Risdon's incision. The tissue is reflected superiorly along the mandibular rami to the sigmoid notch and slight reflected in the lingual surface to facilitate the procedure posteriorly so as to keep the circulation to the proximal segment oof the mandible.



Fig. 4. The Mini- Hoffmann Sets is applied to the two K- wire on proximal segments of the mandible.

In pre- determined position on the mandibular rami, we cut the cortical bone only buccal side incoompletely by using of saw and drilled the two holes on the proximal segment on the mandible inferiorly by using of Kirchner wire('K' wire) with hand drillll these holes should be maintained enoughly to external skeletal pin fixation(Fig. 3). Attention to drilling not to hole throughly(if drilling to the holes throughly, loosen the fixation).

The Mini- Hoffmann sets is now applied to the two K- wire on porximal segments of the mandible. Mini- Hoffmann sets are then adapted on both K- wire and rods without any minor movement on the rods(passively adapted)(Fig. 4).

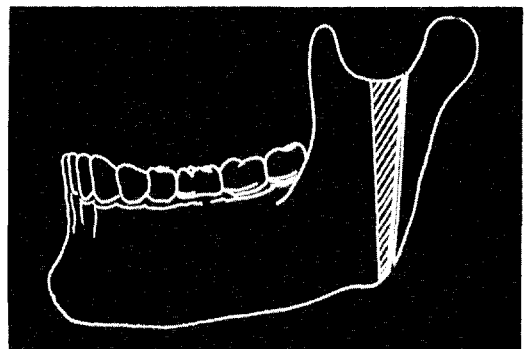


Fig. 5. The osteotomies are performed "wedge- shape" on buccal cortical bone to facilitate the surgically repositioned.

After fixation, we osteomized the mandibular rami throughly which previous incomplete cutting. We have operated the same method both sides. Now,

the proximal segment is placed on the centric relation position.

To facilitate the jaw surgically repositioned, the osteotomies are performed "wedge - shape" on buccal cortical bone to overlapped the two segments(Fig. 5).

### III. RESULTS AND DISCUSSION

Although numerous etiologic factors have been proposed, postoperative relapse still appears to have many causes and show a great deal of individual variation<sup>19</sup>. Suggested contributing factors in mandibular orthognathic surgery include the inadequate periods of maxillomandibular fixation<sup>7</sup>), osteosynthesis technique<sup>14</sup>), perioral musculature<sup>12,18</sup>), condylar distraction<sup>5,7,14</sup>).

The problem of condylar distraction in particular has been discussed by many authors. Epker et al and Pulton et al reported the immediate relapse upon the release of fixation if distraction of the condylar head from the glenoid fossa at the time of surgery<sup>2,14</sup>). Also, Schendel and Epker found that control of the proximal segment was the sinle most important surgical aspect in determining the stability or relapse of the mandibular surgery. Lake<sup>9</sup>) found the position of the proximal segment to be the predominant influence on postoperative stability. Worms<sup>20</sup>) warned of the consequences of condylar distraction that in cases where the condyle is displaced, there is obviously no possibility for spontaneous repositioning. Will et al reported that both condyles moved superiorly during fixation, with the change in the left condyle being greater and at a higher level of significance<sup>19</sup>). The observed superior changes may well be the combined result of masticatory muscle function, cervical collar pressure, and resolution of postoperative intracapsular edema<sup>19</sup>).

The general concern has been that the proximal segment should be maintained in its correct anatomic and preoperative position following the surgical positioning of the distal, or tooth bearing, segment and fixation of the mandible. Failure to correctly position

the proximal segment can result in a bulit - in relapse potential, loss of the gonial angle, condylar sag, pain and dysfunction of the temporomandibular joint, and functional impairment of the masticatory system<sup>22</sup>). In recently, Luhr described a method using on "L" or "T" shaped miniplate adapted to the lateral ascending ramus and to the maxillary arch wire in mandibular surgery<sup>11</sup>). Hiatt et al developed the modification of Luhr's original technique using two 37mm L-shaped miniplates<sup>4</sup>). Raveh et al also developed the three - dimensionally adaptable fixation bar<sup>15</sup>). Kraut have used the stabilizing bone plate in intraoral vertical ramus osteotomy<sup>8</sup>).

This study described in this article were developed to improve the operative techniques and to lessen the postoperative complications in mandibular orthognathic surgery. Advantages to the use of vertical osteotomy for treatment of mandibular prognathism compared to the sagittal split osteotomy include a lower incidence of permanant or temporary inferior alveolar nerve anesthesia or hyperesthesia, decreased incidence of proximal fragment necrosis, less interoperative hemorrhage, easy manipulation, and decrease in amount of soft tissue edema<sup>19</sup>).

We have performed the extraoral vertical ramus osteotomy, but we suggested to gained the same advantages in intraoral approaches by using of transcutaneous trocha.

Particular attention was paid to dysfunction of the temporomandibular joint after the operation. We examined the patients for muscle tenderness to palpation, limitation of mouth opening, and joint noise on movement preor postoperatively. According to records and our examinations, there was no significant findings. Reich and Dolwick found that cracking sounds in the temporomandibular joint region, normally observed in up to 40% of the population without any real complatints<sup>16</sup>).

The possible iatrogenic development of TM joint pain and dysfunction are greatly absent with the correct application of this technique, But this results was short term follow - up studies, further studies are needed to address this problems.

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## 하악골 수직골절단술시 MINI-HOFFMANN SETS 을 이용한 하악 과두의 중심위의 보존

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정인원

악안면 기형에 대한 활발한 치료가 행해지고 있는 가운데 악교정술 후에 발생하는 회귀현상(Relapse)에 대해서는 아직도 많은 연구가 진행되고 있다.

특히 하악골 전돌증으로 후방이동술을 시술받은 환자의 경우에 회귀의 원인으로 Schendel, Epker, Lake, Worms, Ive, Poulton 과 Ware 등 많은 학자들이 하악과두의 부적합한 위치를 강조하였다.

하악골 시상골절단술시에는 이미 Leonard(1976), Zecha 등(1978)이 상악의 선부자에 acrylic 과 wire 또는 retainer 등을 이용하여 하악근심 골편의 보존을 시도하였다.

이에 저자는 하악골 전돌증의 후방 이동량이 큰 경우나 심한 안면 기형이 있는 19명의 환자에 대해 하악지 수직골절단술을 시술한 경우에 주로 정형외과에서 사용하는 External Skeletal Pin Fixation 인 Mini-Hoffmann Sets 을 이용하여 하악과두의 중심교합위 보존에 도움을 주었기에 보고하는 바이다.