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ESTHETIC MANDIBULAR ANGLE REDUCTION ; IST USE AND COMPLICATIONS

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The bulging of mandibular angle area, frequently, make some difficulties in social life due to its reckless appearence, especially in oriental nations. So, many authors had reported its causes and surgical techniques for correction since late 19th century with diagnosis of masseter hypertrophy. But in spite of its muscular origin, major surgical techniques, in general, should aim complete bony reduction or osteotomy and supplemental myotomy as in hemimandibular hypertrophy or mandibular elongation. We used ultrasonogram for soft tissue depth estimation and expearenced some complications such as incomplete lingual cortical bony reduction, condylar fracture in mandibular angle reduction via intraoral circumvestibular approach.

So we reported our surgical technique for angle reduction with possible complications.

I. INTRODUCTION

Maxillofacial deformities are not considered to be a trouble in social life but function. So many maxillofacial plastic surgeons has made efforts to overcome these troubles and bring out more positive life.

Many surgical techiques as ramus osteotomy, segmental osteotomy, genioplasty and etc were developed for those purpose. But almost all of those technique was designed for improving plateral profile or occlusion. Because one saw oneself by mirror, one apt to recognize self unattractive point in his or her frontal profile.

The proper proportion and shape decide esthetic quality. Lower third of face was consist with lip, cheek, mandibular lower border and madibular angle. Widening lower third of face give a impression with muscular and recklessness. And lower and wide mandibular angle makes face squrare shape. Unilateral involovement shows asymmetric face. Those face is considered unfavorable, especially in Korea or Japan.

In the english literature, these features was described "Masseter muscle hypertrophy" or "Benign masseter hypertrophy" and authors reported some surgical procedures for masseter myotomy.

We present a number of cases with mandibular angle bulging which was corrected with mandibular osteotomy or masseter myotomy.

II. EVALUATION

Evaluation for the mandibular angle prominance was variable according to individual character. Hypertrophic mandibular angle was seen more prominent in case with relatively thin neck and neck looks short. The relation or continuity of mandible and neck should be considered severely. Generally esthetic mandibule and neck make smooth line looks like "Hour - glass"[1,2]. Laterally, prominent mandibular angle elongated posterior facial height and shows retruded gonion and steep gonial angle.

For profile evaluations, frontal, lateral, oblique - la-

teral and basal facial photography was utilized. Soft tissue profile and asymmetry could be detected without any difficultes.

The orthopantomogram and cephalo P-A, lateral view have some advantage in evaluation of skeletal pattern. Deformities of mandible could be detected and design for osteotomy could be performed on these X-rays.

Soft tissue depth of mandible angle area was mesured by ultrasonogram or face mask model. Ultrasonogram has many advantages[3] : easy, simple, non-invasive, rapid and inexpensive diagnostic tools. Asymmetric angle hypertrophy was evaluated with ultrasonogram. The ultrasonograms reveal relative depth of masseter muscle or inflammatory muscle changes, if any. These information about muscle depth difference was helpful in masseter myotomy.

Facial mask model was a olny diagnostic tools with 3-demensional character, precise preoperative estimate was made with these model and persuasive data were furnished.

Those preoperative evlauation for osteotomy and myotomy did not provide absolute value for operation but prevent macroscopic error in surgical precedures.

III. TECHNIQUE

All patient was administrated with general anesthesia via nasotracheal intubation. Lidocaine with 1 : 100,000 epinephrine was infiltrated on incision site and on subperiosteal layer for vasoconstriction and clear elevation of periosteum.

Incision was made on mucosa from anterior ascending ramus down to premolar area. And circumvestibular incision was introduced in one case(Fig. 1).

After elevation of periosteum from the mandiblear ascending ramus, to posterior part of mandibular body, direct inspection of mandibula angle and identify bony spurs, mandibular notch, and other anatomical landmarks.

Masster muscle was retracted and entire preoperative osteotomy line was marked on lateral cortex of mandible with small round bur after lateral corticotomy.

Hypertrophied mandibular angle was resected with full thickness along the designed line by sagittal saw (Fig. 2). Sharp edge was smoothened with vulcanite bur. Full extension osteotomy line superiorly to posterior ramus border and anteriorly to inferior border

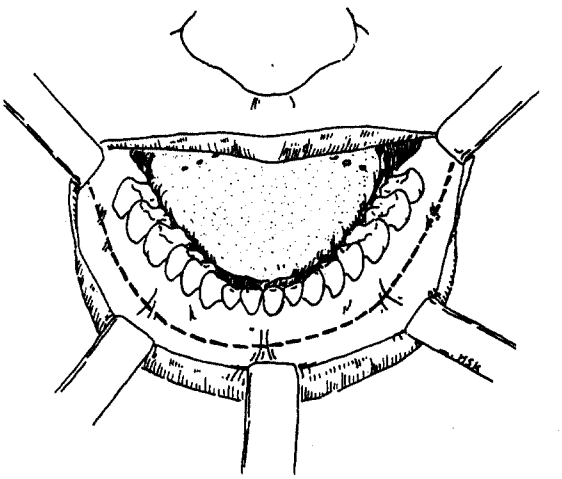

Fig. 1. Designed circumvestibular incision.

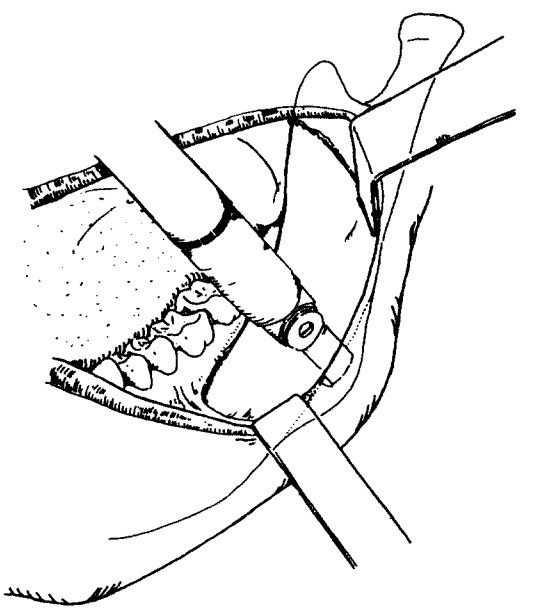

Fig. 2. Intraoral osteotomy by sagittal saw was performed through intraoral incision.

was helpful in avoiding double mandibular angle. Masseter muscle was resected as indicated.

After complete hemostasis, vacuum suction drain was inserted and water tight suture was performed. Pressure dressing was continuing for postoperative 3-4 days.

Ⅳ. CASE REPORTS

case 1

This 27-year-old female patient complained square face due to prominent mandibular angle. her both mandibular angle was resected as described above in surgical technique. Postoperative orthopantomogram showed undesigned, partially remained lingual cortical bone due to the incomplete resection of lateral and lingual cortex and visual disturbance. (Fig. 3).

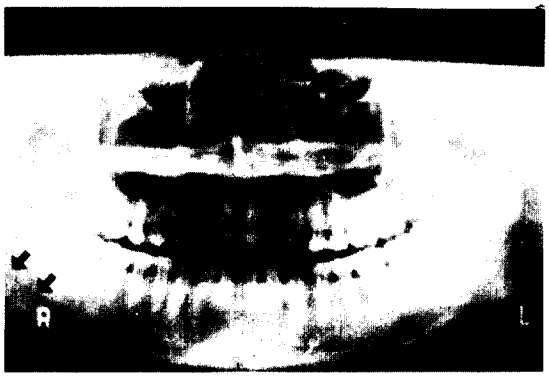

Fig. 3. Orthopantomogram. Unilateral hypertrophy of mandibular angle could be detected in preoperative orthopantomogram and an arrow of postoperative orthopantomogram indicates remined lingula cortical bone due to incomplete osteotomy.

case 2

This 22-year-old male patient complained asymmetric face. Preoperative orthopantomogram shows unilateral hypertrophied mandibular angle. Ultrasonogram shows thickening masserter muscle unilaterally. During operation, incomplete osteotomy lead to utilize chisel and mallet as in this case, however, malleting could be resulted in unexpected mandibular fracture, especially condylar area.(Fig. 4).

case 3

This 32-year-old female patient shows steep gonial angle and prominent mandibular angle. Cephalo P-A and lateral view analysis showed bilateral mandibular elongation and mandibular prognathism. Her chief complaint was mandibular angle and she did not want to mandibular set-back surgery. Entire mandibular angle was resected and postoperative results shows ovoid facial profile. Basal profile shows rounded gonial angle(Fig. 5, 6).

case 4

27-year-old female patient complained her anattractive face with muscular appearence. Orthopantomogram and cephalo P-A and lateral views revealed mandibular hypertrophy at angle area. We resected entire mandibular angle with full thickness. Postope-

Fig. 4. Postoperative orthopantomogram. Unilateral mandibular angle osteotomy was incomplete with sagittal saw, so malleting was introduced. And this procedure could be followed by unexpected condylar fracture.

Fig. 5. Orthopantomogram. Elongated horizontal ramus of both side was detected in preoperative orthopantomogram.

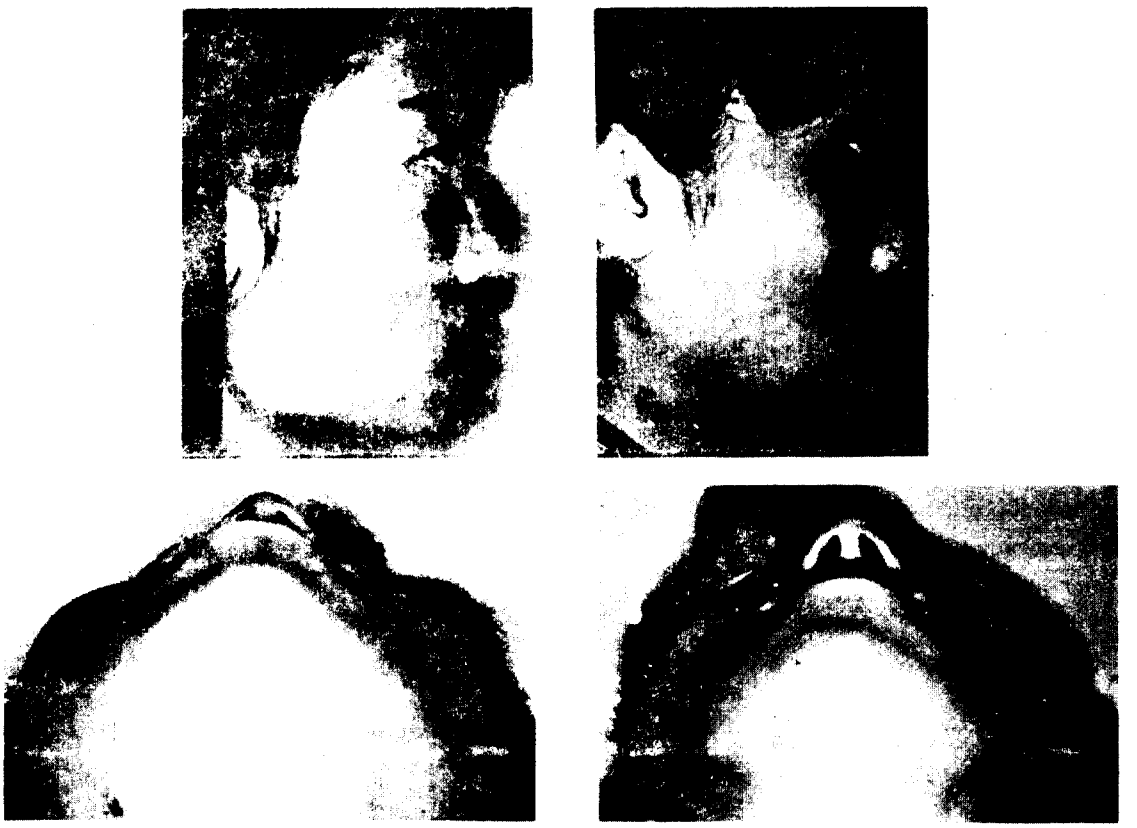

Fig. 6. Preoperative and postoperative frontal photograph. Because this patient had very prominent mandibular angle, lateral corticotomy alone would not affect facial profile as was desired. So sufficient volume of mandibular angle was resected in full thickness. Basal photograph. Postoperative photograph shows reduced prominency of mandibular angle. Notice smooth continuity from mandible to neck.

rative photography shows rounded mandibular angle and smoothened gonial angle(Fig. 7).

All patient with mandibular angle reduction or masecter myotomy showed immediate postoperative trismus and recovered within two weeks. There were

Fig. 7. Frontal and basal photograph. Postoperative photograph shows smoothened facial contour.

some other complications in our cases except remained cortical plate and condylar fracture, hematoma formation was noticed in one patient, postoperative edema was detected in all case. Hematoma was resolved with drainage by removal of a few intraoral stitches. Infection was not occurred at all cases. parotid gland injury or facial nerve injury were not observed.

V. DISCUSSION

In english literature, masseter muscle hypertrophy was first reported by Legg in 1880[4]. But treatment was not mentioned in his report. In 1947, Gurney reported a case of chronic bilateral benign hypertrophy of the masseter muscle, and this case appers to be the first sugically treated for cosmetic reasons[5]. Before that time, many authors had reported benign masseter hypertrophy with managed with sedatives, reassurrance or only observation[6,7,8,9].

In 1971, Wade reviewed the surgical procedure of some surgeons. Masseter muscle resection was main procedure of those techniqueand additional osteoplasty for bony spur of mandibular angle by extraoral skin incision[10]. In 1951, Converse had resected both bone and masseter muscle by intraoral approach [11]. Intraoral incision has a limited value in measuring and designing the osteotomy line. So preoperative planning should be more precise. We used two types of intraoral incision : Incision for sagittal ramus osteotomy and circumvestibular incision. The circumvestibular incision was more helpful in designing and measurign. And more precise procedure was possible in such a case.

In 1984, Riefkohl and at al. reported ten patients with benign masseter hypertrophy and treated them with myotomy and resection of bony spur by intraoral approach. He also use arcrylic cocclusal splint for avoid recurring muscle hypertrophy[12].

Pathogenesis of masseter hypertrophy or promi-

nent mandibular angle is obscure. Authors reported temporomandibular disorders, sepsis, chewing habits or congenital arteriovenous fistula as pathogenesis[13]. In 1986, Obwegeser classified mandibular deformities into mandibular hypertrophy and mandibular elongation, and suggested growth control by information in the fibrocartilage of mandibular condyle. The orthopantomogram of case 1 revealed unilateral mandibular hypertrophy, smooth and convex inferior mandibular border of mandible and enlarged condyle. A mandibular elongation could be defined as mandbile with hypertrophied horizontal ramus. In case 3, some features of bilateral mandibular elongation, protruded mandible with normal gonial notch and spacing between teeth were observed in clinical and radiologic exammination. In case 3, some features of bilateral mandibular elongation, protruded mandible with normal gonial notch and spacing between teeth were osberved in clinical and radiologic exammination. In case 1 or 4, typical features for classfication were not detected. He also recommentde special consideration on this fibrocartilage in surgical planning. But more clincal evaluation should bo proceeded to application to surgical procedure[14,15].

Preoperative evaluation for bigonial width is important in estimating the mandibular angle or masserter muscle shoud be resected. Ultrasongogram gave useful information in those procedure for the relative muscle thickness.

Whitaker recommended physical anthropology measurement. But esthetic evaluation is too obscure to applicate simple and rigid forms. Entire facial profiele and proportion of nose, lip and etc should be considered for individual beauty. But we recognize the neceassity of multi-factoral standardization[16].

For improve steep gonial angle, we resected entire mandibular angle area rather than corticostomy. Full thickness bone resection is apt to injure inferior alveolar bundle, so this technique has limited reduction volume postero-inferior to inferior alveolar canal. In such cases that mandible should be resected anteriorly to inferior alveolar canal, simple corticotomy for additional area and full thickness mandible resection are recommendable. About myotomy of masseter muscle, in 1989, Loh reported new technique using two artery forceps. He resected muscle at first and mandible later[17].

Suction drain and pressure bandage was necessary for reduce postoperative swelling and hematoma formation. Postoperative swelling was common complication of this operation. Generally postoperative swelling continued 4-7 days. And postoperative trismus was also common in all cases but this complication could be resoloved within two weeks.

This surgical procedure is simple, safe and effective correction technique for prominent mandibular angle without severe complications. We may also recommend this procedure as supplemental technique in orthognatic mandibular set-back surgery for angle contouring.

VI. SUMMARY

We reported for cases which undertaken angle reduction for esthetic problem in department of oral and maxillofacial surgery, chungnam natinal university hospital. This procedure has some advantages of effective results with simple procedure, short operating time and no severe complication.

But some complications may occur infrequently as was seen in above cases, remained lingual cortical plate due to incomplete resection and condylar fracture due to inadequate malleting. And we encountered some difficulties in precise measuring and accurate prediction of postoperative results and the problems to resolve.

However, We recommend this proccedure as useful technique for facial profile contouring by oral and maxillofacial surgeons.

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국문초록

하악 우각부 미용 성형술 ; 임상적 응용과 병발증

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악안면부의 기형은 기능 및 심미적인 매우 중요한 문제이며, 이러한 면에서 현대 악안면 영역의 성형술은 기능 및 사회심리적으로 많은 기여를 한다는 것은 사실이다.

악안면 성형술 중 하악 우각부에 대한 관심은 19세기 후반부터 교근비대증(Masseter Hypertrophy)으로 표현되었으며, 안모의 심미적인 영향에 대한 평가는 동양에서 하악골의 변형과 함께 비중있게 다루어지고 있다.

교근비대 또는 협부비대의 원인은 악성 및 양성종물, 악습관에 의한 생리적 비대, 감염, 선천적기형 등이 있을 수 있으나, 환자가 호소하는 주소는 안면의 비대칭 또는 사각형의 안모등이므로 이에 대한 수술의 주된 목적은 심미적인 면이 대부분을 차지한다고 볼 수 있다. 그러므로 안모개선 등 수술 후의 결과에 대한 깊은 관심이 요구되며, 따라서 혈종이나 감염, 하악골 골절, 개구장애 등과 같은 합병증과 후유증에 대한 올바른 이해와 최대한의 예방이 필요할 것으로 사료되어 문헌고찰과 함께 증례보고를 하는 바이다.