

SURGICAL CORRECTION OF ASYMMETRIC MANDIBULAR EXCESS*

Pill-Hoon Choung, D.D.S., M.S.D.

*Dept. of Dental & Oral Surgery, Chung-Nam National University
Hospital, Tae-Jeon, Korea*

INTRODUCTION

Minor asymmetry of the face is entirely normal, and it is only when the degree of asymmetry becomes obvious that patient desires its correction. Facial asymmetry is more dominant resulted from mandibular asymmetry which normally exist the two halves of the mandible to some degree. The cause, classification, and recommended treatment were discussed in a great deal of literature.^{7,10,11,12,18,19,20,27,29)} A comprehensive discussion and review of the literature concerning classification was presented by Rushton in 1944²⁶⁾, Hinds and others in 1960, Rowe in 1960²⁸⁾ Cornea in 1967⁶⁾, Bruce and Hayward in 1968⁵⁾, Jonck in 1975¹⁷⁾, and Bell in 1980¹⁴⁾.

The author classified patients with asymmetric mandibular excess into three types according to Bruce and Hayward and Bell¹⁴⁾: deviation prognathism, unilateral condylar hyperplasia, and unilateral macrognathism.

This paper presents 21 cases of asymmetric mandibular excess with their classification, direction or site of deviation, amount of deviation, and surgical design of correction. Also this paper reports some findings in the surgical treatment of asymmetric mandibular excess.

MATERIALS AND METHODS

The patients studied consisted of 21 individuals who underwent orthognathic surgery for correction of facial asymmetry caused by asymmetric mandibular excess. The patients treated were evaluated with a detailed clinical examination and by esthetic analysis using photography, plaster model of full face, X-ray of skull series, and cephalogram, and by occlusal analysis using paper surgery and model surgery.

All the patients were operated by the author and assistant at the 00 Hospital of Korean Army and Chung-Nam National University Hospital from 1982 to 1985 using various methods for the individual's demands.

Patient data were collected including age and sex, direction or site of deviation, amount of deviation, classification, occlusal involvement, other involvement, type of anesthesia, design of operation, and complications.

* Supported in part by Chung-Nam National University Hospital Research Institute in 1985.

RESULTS

A total of 21 patients were operated by various fashions and collected data are shown in Table 1. The patient population included 18 males and 3 females, with an average of 23.7 years (range 17-42 years).

14 patients were deviation prognathism 3 patients were unilateral condylar hyperplasia. 4 patients were unilateral macrognathia.

The majority of patients' chins were deviated to the left, although one of which midline was deviated to the left, the affected site was right mandibular angle, and one patient chin was deviated to the right. Amount of deviation at the dental midline was an average of 2.4 mm and at the chin midline was an average of 4.4mm.

Unilateral condylar hyperplasia was found on the right side in 2 patients, and on the left side in 1 patient but all 3 patients' chins were deviated to the left side.

14 patients were operated under general anesthesia and 7 patients were under local anesthesia with sedation. 5 patients combined with facial bone fractures were treated simultaneously.

Various surgical design and procedures used in the treatment of the patients are shown in Fig. 1 and Table 2.

DISCUSSION

Probably the earliest recorded case of facial asymmetry, at least in the English literature, was that of Mary Keefe, reported by Adams in 1836¹). During the next century and a half, and up to date, the diversity of opinion concerning mandibular asymmetry has been expressed by many authors. Several attempts have been made to categorize the deformity of mandibular asymmetry. The author classified mandibular asymmetry in two groups clinically: asymmetric mandibular excess and asymmetric mandibular deficiency. Asymmetric mandibular excess were classified into three types as Bruce and Hayward and Bell¹⁴) described: deviation prognathism with a generalized proportionate increase in the size of the mandible and increased unilateral growth component, unilateral condylar hyperplasia manifested by an enlarged condylar head resulting in a crossbite and laterognathia, and unilateral macrognathia with a generalized increase in half of the mandibular body with or without compensatory maxillary and mandibular dentoalveolar adaptation.

Hovell and Gesell said that minor asymmetry of the two halves of the facial components is defined as normal until such time as the deviation exceeds the normal ideals of the beholder.¹⁰) We now have the task of defining where "normality" stops and "asymmetry" begins.

The determination of what is a pleasant or unpleasant facial appearance is a subjective judgment and one that must be left to the discretion of the patient. In this study, patient actively complained his unpleasant asymmetric facial appearance when the chin midline deviated to one side more than 4mm.

Asymmetric mandibular excess is characterized by deviation of the chin to one side of the facial midline. In this study, the majority of the patients' chins were deviated to the left side.

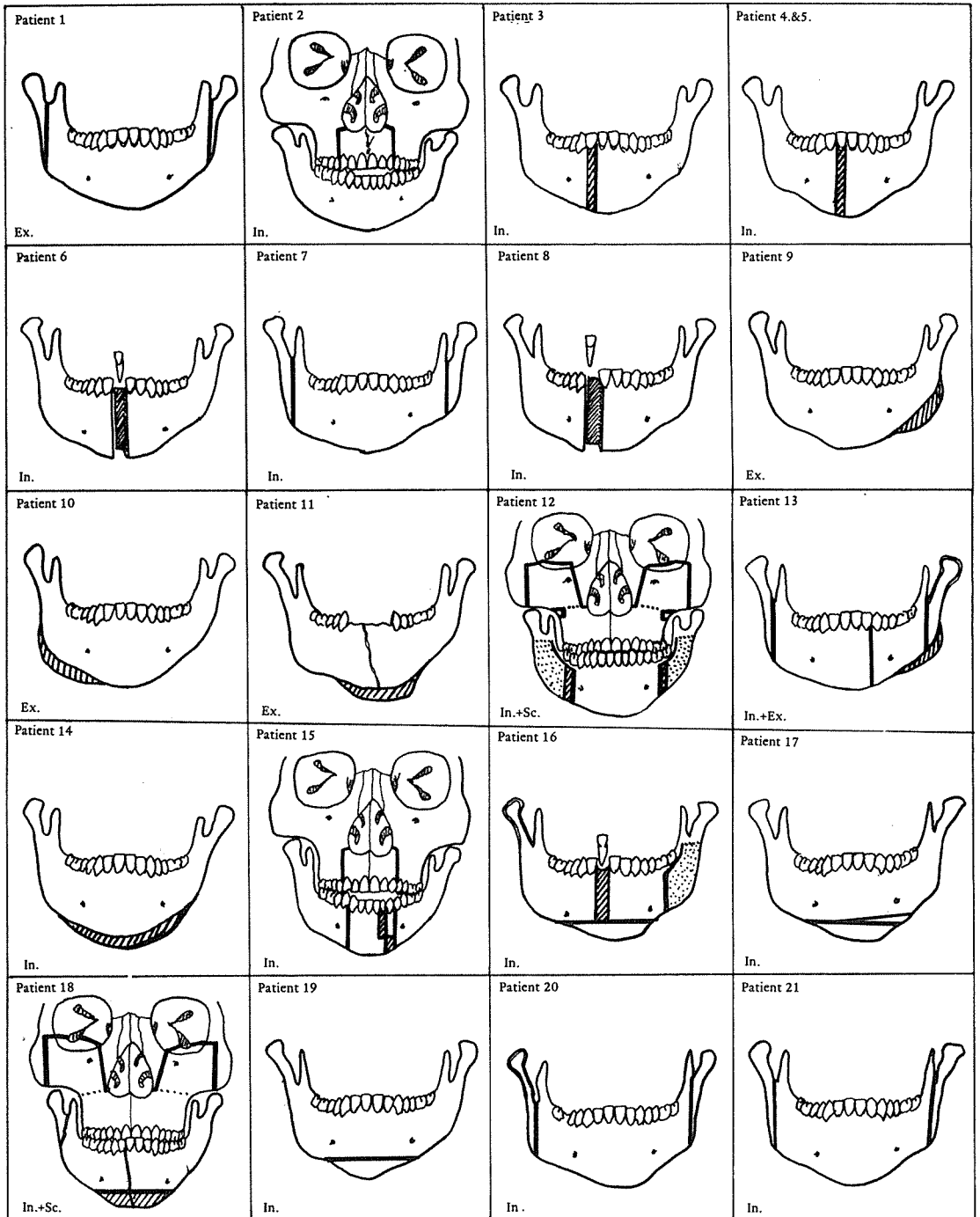
Table 1. Main data of the patients treated by various surgical procedures for correction of asymmetric mandibular excess

| Patient | Age | Sex | Direction of deviation | Amount of dev. | | Classification | Occlusion | | | | Design of operation | Type of anesthesia | Other involvement | Complication |
|---------|-----|-----|------------------------|----------------|--------------|-------------------------------------|-----------|----------|-----------------------------|--|---------------------|---|-----------------------------|--------------|
| | | | | dental midline | chin midline | | anterior | | Posterior | | | | | |
| | | | | | | | overjet | overbite | Rt | Lt. | | | | |
| 1. | 21 | M | Lt. | 2.0 | 3.0 | deviation prognathism | -1.0 | 0.5 | classIII classIII | Extraoral vertical osteotomy bilaterally | G | | | |
| 2. | 20 | M | Lt. | 1.5 | 3.0 | deviation prognathism | 1.5 | -2.5 | classIII classIII | Anterior maxillary osteotomy | G | open bite | dehescence on gingiva of 3] | |
| 3. | 22 | M | Lt. | 2.5 | 5.0 | deviation prognathism | -1.0 | 0.5 | classIII classIII | Symphyseal osteotomy with removal of 2] | Local | | | |
| 4. | 22 | M | Lt. | 1.0 | 3.0 | deviation prognathism | -1.0 | -2.0 | classIII classIII | Symphyseal osteotomy with removal of 2] | Local | | | |
| 5. | 21 | M | Lt. | 1.0 | 3.0 | deviation prognathism | -1.5 | -1.0 | classIII classIII | Symphyseal osteotomy with removal of 1] | Local | | | |
| 6. | 23 | M | Lt. | 2.5 | 4.0 | deviation prognathism | -2.0 | 0 | classIII crossbite | Overlap symphyseal osteotomy with removal of 1] | Local | | | |
| 7. | 23 | M | Lt. | 3.0 | 5.0 | deviation prognathism | -2.1 | -1.1 | classIII crossbite | Extraoral vertical osteotomy bilaterally | Local | | | |
| 8. | 23 | M | Lt. | 3.0 | 5.0 | deviation prognathism | -1.8 | -1.0 | classIII crossbite | Overlap symphyseal osteotomy with removal of 2] | Local | | | |
| 9. | 42 | M | Lt. | 0.5 | 1.0 | unilateral macrogathia | 0.5 | 0.5 | crossbite classIII | Contouring of Lt. mandibular Angle | G | | | |
| 10. | 26 | M | Lt. | 1.0 | 2.0 | unilateral macrogathia | 0.5 | 0.5 | classIII class I | Contouring of Rt. mandibular Angle | G | | | |
| 11. | 28 | M | Lt. | ? | 4.0 | deviation prognathism | ? | ? | classIII classIII | Contouring of chin + open reduction | G | fracture on symphysis-loss of lower teeth | | |
| 12. | 23 | M | Lt. | 2.5 | 3.0 | deviation prognathism | -13.2 | 2.5 | classIII classIII | Modified LeFort III osteotomy + sagittal split osteotomy + bone graft | G | midface retrusion | temporary leukopenia | |
| 13. | 20 | M | Lt. | 3.0 | 4.5 | Lt. unilateral conlar hyperplasia | -1.5 | 0.5 | class III crossbite | Extraoral vertical osteotomy bilaterally + Contouring of Lt. mandibular angle + Symphysis osteotomy | G | | | |
| 14. | 24 | F | Lt. | 3.0 | 5.0 | deviation prognathism | 0.5 | 0.5 | classIII classIII | Contouring of chin | Local | | | |
| 15. | 25 | M | Lt. | 2.5 | 8.0 | Rt. unilateral condylar hyperplasia | 2.0 | 1.5 | classIII linguoversion | Sagittal split osteotomy + Symphyseal osteotomy with removal of 1] | G | | | |
| 16. | 19 | F | Lt. | 2.0 | 4.0 | deviation prognathism | 0.5 | -3.0 | classIII classIII | Anterior maxillary osteotomy + Anterior mandibular segment osteotomy + Symphyseal osteotomy with removal of 2] | G | openbite | | |
| 17. | 28 | M | Lt. | 3.5 | 6.0 | unilateral macrogathia | 2.0 | 1.5 | classIII classI | Repositioning of chin + bone transplantation | G | | | |
| 18. | 17 | M | Lt. | 3.0 | 5.0 | deviation prognathism | -3.0 | 1.5 | classIII crossbite classIII | Modified LeFore III osteotomy + Contouring of chin + Open reduction + bone graft + Enucleation | G | midface retrusion + Rt. subcondyle and symphyseal fracture + dentigerous cyst | | |
| 19. | 27 | M | Rt. | 2.0 | 6.0 | unilateral macrogathia | ? | ? | class I class I | Repositioning of chin | G | zygoma fracture + loss of upper teeth | | |
| 20. | 18 | F | Lt. | 5.8 | 7.0 | Rt. unilateral condylar hyperplasia | -3.0 | 3.0 | classIII classIII | Intraoral vertical osteotomy bilaterally | G | | | |
| 21. | 20 | M | Lt. | 3.5 | 6.0 | deviation prognathism | -2.2 | -1.5 | ClassIII classIII crossbite | Intraoral vertical osteotomy + Extraoral vertical osteotomy | G | | | |

(mm) G: general anesthesia

Table 2. Types of osteotomies performed

| Area | No. Patients | Area | No. Patients |
|--|--------------|---|--------------|
| Midface | | Mandible | |
| Modified LeFort III osteotomy (LeFort I + Malar advancement) | 2 | Symphyseal osteotomy | 1 |
| Anterior maxillary osteotomy | 2 | Overlap symphyseal osteotomy | 2 |
| Mandible | | Anterior mandibular segment osteotomy | 1 |
| Extraoral vertical osteotomy | 3 | Repositioning of chin (with bone transplantation) | 3 |
| Intraoral vertical osteotomy | 2 | Contouring of affected site | 6 |
| Sagittal split osteotomy | 2 | Single tooth osteotomy | 1 |
| Symphyseal osteotomy | 5 | | |



In.: Intraoral Ex.: Extraoral Sc.: Subciliary approach.

Fig. 1. Surgical design and procedures performed in the treatment of the patients.

Although there has been no reported opinion concerning distribution of the site, at least in the Korean literature,^{34,36,39,43,44,45,46,47,48,53,54,55,56)} there is predilection for deviation of the chin to the left side. Particularly deviation prognathism tends to be deviated to the left side. Whether this finding has some relation to that most of Koreans open their mouth with deviation toward the left side is not certain.

In the surgical treatment of mandibular asymmetry, condylectomy was the first surgical procedure.¹⁶⁾ Its limitation of usefulness permits another advance and great versatility in the treatment of mandibular asymmetry and even in the involvement of midface.

In this study, contouring of the mandibular body done alone or as part of a multiple surgical procedure⁴⁰⁾ were performed as shown Table 2. Minor deviation prognathism were corrected by symphyseal ostectomy which was described originally by Plumpton²⁵⁾ and reported later by Garlitz¹¹⁾ and others.^{35,53,54)} Further deviated minor prognathism were corrected by Overlap symphyseal ostectomy⁵⁴⁾ which was modified by the author and the results were better than original symphyseal ostectomy. If the prominent contributing feature of the asymmetry is excessive height in the body with an acceptable occlusion, contouring⁴⁾ of the affected mandibular body was done. Symphyseal ostectomy and contouring procedure can be performed easily by local anesthesia without specific instrument. In general, bilateral vertical osteotomy or sagittal split osteotomy best corrects most cases of deviation prognathism. In severe cases, vertical osteotomy and contouring of the affected site were used. Vertical osteotomy can be performed via extraoral approach or intraoral approach. When intraoral vertical osteotomy^{2,13,15,24)} is compared with extraoral approach, it has the advantage of avoiding of possible facial nerve damage and external scar, and the disadvantage of lack of visibility and difficulty in directly visualizing the bone cut. Recently intraoral vertical osteotomy has been more detailed and refined since Winstanley³¹⁾ in 1968 described an intraoral approach using a straight handpiece. But a great deal of retraction of soft tissue is necessary to make the bony cuts intraorally. Massey et al²⁴⁾ proposed that mandibles with angles of divergence greater than 150° can be easily operated on via intraoral approach. In severely deviated cases of asymmetric mandible, although the mandibular divergence angle is not so much as 150° , the affected side of the lateral ramus has more adequate visibility. In severe case of Patient 20, prognathic mandible was deviated to the left side 7 mm because of unilateral hyperplasia of right condyle, the author could perform the osteotomy on the right ramus first intraorally with less difficulty in gaining access to the lateral aspect of the ramus. Then the same procedure was performed on the left side. The approach to the left ramus is considerably improved over the first side as a result of the ease of mandibular rotation permitted by the previously cut ramus. Sagittal split osteotomy^{23,38)} is a convenient alternative to the intraoral vertical osteotomy. A similar incision is used for performing either osteotomy: thus it provides the surgeon with a choice of procedures for the patients who prefer the intraoral approach. As a simple procedure, unilateral vertical osteotomy or sagittal split osteotomy could be performed in minor deviations of the mandible which could be corrected without placing excessive torque on the opposite side. If the patient had a long-standing T.M.J. dysfunction, the osteotomy on the opposite side should be performed. If possible, all the surgical procedures should be

designed as simple and a single procedure with the best results. However, in severe mandibular excess in the presence of midfacial retrusion, procedures on both midface and mandible^{8,9,21, 22,30}) were required to achieve an optimum result. In Patient 12 and 18, to correct malar-maxillary deficiency as well as asymmetric deviation prognathism, modified LeFort III malar-maxillary advancement with combined mandibular osteotomy procedures⁵⁵) were performed. To correct the open bite⁴²), anterior maxillary osteotomies^{50,52}) were performed in two patients, and one of which was combined with anterior mandibular segment osteotomy and additional single tooth osteotomy for proper dental alignment without orthodontic treatment. Thus if there is a maxillary component³⁷) to the facial asymmetry, simultaneous maxillary and mandibular bilateral osteotomies^{36,49}) or quadruple osteotomy additional malar bone advancement are indicated to achieve an optimum result.

In construction of acrylic bite spint, slight overcorrection for relapse^{32,33,41}) was done after mounting the model on a semiadjustable articulator from a facebow transfer. In consideration of complications,⁵¹) no significant complication was occurred. But in Patient 2, there was a slight dehescence on the gingiva of 3 near the osteotomy line. In Patient 12, a temporary leukopenia occurred which made him transferred to Capital Armed Forces General Hospital where correction of the prognathic mandible was done by In-Won Choung and Jae-Seung Kim because of the author should be resigned from the military service.

Although there is some controversy concerning the timing of the surgical correction, all of the patients in this study were past adolescence when operated on, and satisfactory results were obtained. But it is necessary to determine the activity of the growth center in many ways such as serial plaster models recommended by Rushton, and cephalometric radiographs at six month intervals recommended by Hovell. Recently, a radionuclide bone scan (Technetium 99m pyrophosphate bone scan) permits immediate evaluation of an abnormal growth center.³)

SUMMARY

The author treated 21 patients of asymmetric mandibular excess by various surgical procedures, and analyzed and observed the main data such as age, sex, direction of deviation, amount of deviation, occlusion, classification, type of anesthesia, design of operation, other involvement, and complications. Some observations and findings are as follows.

1. 21 patients of asymmetric mandibular excess were classified into three types: 14 patients of deviation prognathism, 3 patients of unilateral condylar hyperplasia, and 4 patients of unilateral macrognathia.
2. 17 patients were operated by osteotomy and ostectomy, or both, of the mandible. 3 patients were corrected by combined procedures on both maxilla and mandible, and two of which were corrected via additional malar advancement by modified LeFort III osteotomy. One had maxillary osteotomy only.
3. One interesting finding is that the majority of the patients' chins were deviated to the left side, particularly in deviation prognathism.

4. In severely deviated cases of asymmetric mandible, it would appear that intraoral vertical osteotomy can be performed more easily because of more adequate visibility of the affected side of lateral lamus, although the mandibular divergence angle is not so much as 150° .
5. Surgical procedures should be designed as simple as possible for the patient's deformity and demands with an optimum result.

REFERENCES

1. Adams, R.: A Treatise on Rheumatic Gout or chronic Reumatic Arthritis of all the joints. 2nd Ed. London: Churchill, p237, 1873. Sited from Hall, H.D.: Facial asymmetry. In Bell, W.H.: Surgical correction of dentofacial deformities, Vol. III, Philadelphia: W.B. Saunders Co., p. 153, 1985.
2. Akin, R.K., and Walters, P.J.: Experience with the intraoral vertical subcondylar osteotomy. *J. Oral Surg.*, 33: 342, 1975.
3. Beirne, O.R., and Leake, D.L.: Technatium 99m pyrophosphate uptake in a case of unilateral condylar hyperplasia. *J. Oral Surg.*, 38: 356, 1980.
4. Blair, A.E. and Schneider, E.K.: Intraoral inferior border osteotomy for correction of mandibular asymmetry. *J. Oral Surg.* 35: 493, 1977.
5. Bruce, R.A., and Hayward, J.R.: Condylar hyperplasia and mandibular asymmetry: a review. *J. Oral Surg.* 26: 281 April 1968.
6. Cornea, A., and Meisels, E.: Asymmetry of the mandible from unilateral hypertrophy. *Ann. Surg.*, 83: 755, 1926.
7. Epker, B.N., and Wolford, L.K.; Dentofacial deformities, surgical-orthodontic correction. ed. 1., St. Louis., The C.V. Mosby Co., 1980.
8. Epker, B.N., and Wolford, L.M.; Middle-third facial advancement: Treatment considerations in atypical cases, *J. Oral Surg.*, 37: 31, 1979.
9. Epker, B.N., Turvey, T.A., and Fish, L.C.: Indications for simultaneous mobilization of the maxilla and mandible for the correction of dentofacial deformities, *Oral Surg.*, 54: 491, 1982.
10. Erickson, G.E., and Waits, D.E.: Mandibular asymmetry, *J.A.D.A.*, 89: 1369, 1974.
11. Garlitz, R.M., Tatoian, J.A., and Gamble, J.W.: Correction of laterognathism, *J. Oral Surg.*, 28: 443, 1970.
12. Grazinia, M.: Laterognathism, supraclusion, and facial asymmetry from condylar hyperplasia., *Oral Surg.*, 33: 884, 1972.
13. Hall, H.D., Chase, D.C., and Payor, L.G.: Evaluation and refinement of the intraoral vertical subcondylar osteotomy. *J. Oral Surg.*, 33: 333, 1975.
14. Hayward, J.D., Walker, R.V., Poulton, D.G. and Bell, W.H.: Asymmetric mandibular excess. In Bell, W.H. et al.: Surgical correction of dentofacial deformities, Vol. II, Philadelphia: W.B. Saunders Co., p.947, 1980.
15. Hebert, J.M., Kent, J.N., and Hinds, E.C.: Correction of Prognathism by an intraoral vertical subcondylar osteotomy. *J. Oral Surg.* 28: 651, 1970.
16. Humphery, G.H.: Excision of the condyle of the lower jaw. *Assoc. Med. J.* 160: 61-62, 1856. Sited from Hall, H.D.: Facial asymmetry. In BELL, W.H.: Surgical correc-

- tion of dentofacial deformities, Vol. III, Philadelphia: W.B. Saunders Co., p. 153, 1985.
17. Jonck, L.M.: Facial asymmetry and condylar hyperplasia. *Oral Surg.*, 40: 567, 1975.
 18. Jonck, L.M.: Condylar hyperplasia. *Int. J. Oral Surg.*, 10: 154, 1981. '81.
 19. Keen, R.R., and Callahan, G.R.: Osteochondroma of mandibular condyle. *J. Oral Surg.*, 35: 140, 1977.
 20. Koehl, G. II., and Tilson, H.B.: Osteochondroma associated with facial asymmetry and masticatory dysfunction. *J. Oral Surg.*, 35: 949, 1977.
 21. Kolodny, S.C., Smart, E.A., Roche, W.C., Swimley, D.C., and Marano, P.D.: Review of 118 dentofacial corrections. *J. Oral Surg.*, 29: 294, 1971.
 22. LaBanc, J.C., Turvey, T.A., and Epker, B.N.: Results following simultaneous mobilization of the maxilla and mandible for the correction of dentofacial deformities: Analysis of 100 consecutive patients, *Oral Surg.*, 54: 607, 1982.
 23. Martis, C., Karabonta, I., and Lazaridis, N.: Severe unilateral condylar hyperplasia corrected by modified sagittal split osteotomy. *J. Oral Surg.*, 37: 835, 1979.
 24. Massay, G.B., Chase, D.C., Thomas, P.M., and Kahn, M.W.: Intraoral oblique osteotomy of mandibular ramus. *J. Oral Surg.*, 32: 755, 1974.
 25. Plumpton, S.: Surgical correction of unilateral mandibular prognathism by intraoral osteotomy of the symphysis, *Br. J. Plast. Surg.* 20: 70. Jan., 1967.
 26. Rushton, M.A.: Growth at the mandibular condyle in relation to some deformities, *Brit. Dent. J.*, 76: 57, 1944, cited from Bell, W.H.: Surgical correction of dentofacial deformities, Vol. II, Philadelphia: W.B. Saunders Co., p. 947, 1980.
 27. Tarsitano, J.J., and Wooten, J.W.: The asymmetrical mandible, *J. Oral Surg.*, 28: 832, 1970.
 28. Rowe, N.L.: The etiology, chinal features and treatment of mand. deformity, *Brit. Dent. J.*, 108: 45, 1960.
 29. Souyris, F., Moncarz, V., and Rey, P.: Facial asymmetry of developmental etiology. *Oral Surg.* 56: 113. 1983.
 30. Turvey, T.A., Hall, D., Fish, L.C., and Epker, B.N.: Surgical-Orthodontic treatment planning for simultaneous mobilization of the maxilla and mandible in the correction of dentofacial deformities, *Oral Surg.*, 54: 491, 1982.
 31. Winstanley, R.P.: Subcondylar osteotomy of the mandible and the intraoral approach. *Br. J. Oral Surg.* 6: 134 Nov. 1968.
 32. 김종원: 하악전돌증의 술후 교합 및 저작태도에 관한 연구. *대한치과의사협회지*, 17: 41, 1979.
 33. 김종원: 악교정 수술후 안면연조직 변화에 관한 연구. *대한구강의과학회지*, 8: 67, 1982.
 34. 김명래, 김태인: 편측성 하악거대증으로 인한 비대칭 안모의 외과적 악교정 일례. *대한구강·악안면외과학회지*, 10: 83, 1984.
 35. 김민형, 김명진: 하악정중부 골절단술과 양측 하악지 수직골절단술에 의한 하악전돌증의 치험예. *대한악안면성형외과학회지*, 4: 51, 1982.
 36. 김재승: 상악후퇴증 및 하악전돌증의 악교정수술예. *대한치과의사협회지*, 23: 979, 1985.
 37. 민병일, 이동근, 정필훈: LeFort I 골절단술에 의한 상악골 기형의 치험예. *대한악안면성형외과학회지*, 3: 55, 1981.
 38. 민병일, 정필훈, 김재승: 계단식 하악골체 절단술과 Sagittal split osteotomy에 의한 하악골전돌증의 악교정에. *대한구강의과학회지*, 8: 46, 1982.
 39. 민병일, 김종열, 임창춘: 제 1, 2 새궁 증후군에 의한 비대칭적 안면의 외과적 처치에 대한

- 치험예. 대한악안면성형외과학회지, 4:57, 1982.
40. 민병일, 최인호, 백승진: 하악골 상행지 수직 골절단술과 이성형술을 이용한 하악골 전돌증 환자의 외과적 치험예. 대한악안면성형외과학회지, 5:7, 1983.
 41. 양동규, 양원식, 김종원: 악교정 수술후 두부 경조직의 계측학적 변화. 대한구강외과학회지, 8:47, 1982.
 42. 윤중호 외 6인: 개교증을 동반한 하악전돌증의 외과적 치험례. 대한구강외과학회지, 7:91, 1981.
 43. 이열희, 김석환, 김재연, 김무중: 비대칭 안모를 가진 환자의 외과적 교정일예. 대한악안면성형외과학회지, 3:79, 1981.
 44. 이상철, 김여갑, 안재희: 비대칭 안모의 intraoral vertical subcondylar osteotomy에 의한 치험예. 대한악안면성형외과학회지, 7:21, 1985.
 45. 이상철, 김여갑, 이종태: 악관절통을 동반한 편측성 하악 과성장외과적 치험 2례. 대한악안면성형외과학회지, 7:33, 1985.
 46. 이상철 외 4인: 편측성 하악두 증식에 의한 비대칭 안모의 악교정 외과적 치험예. 대한악안면성형외과학회지, 5:29, 1983.
 47. 이의웅, 김형곤: 개교증을 수반한 비대칭 하악 전돌증의 치험예. 대한악안면성형외과학회지, 3:33, 1981.
 48. 이충국, 양성익, 최병호: 편측성 하악골 과성장으로 인한 비대칭 안모의 치험예. 대한악안면성형외과학회지, 7:41, 1985.
 49. 이충국 외 5인: 상·하악골 동시 이동술. 대한구강·악안면외과학회지, 11:124, 1985.
 50. 이동근: 상악골 전치부 분절 골절술에 의한 상악골 기형의 치험예, 10:111, 1984.
 51. 이희철, 이희원, 강신익: 악골의 추형 및 기형의 외과적 수술시의 합병증. 대한악안면성형외과학회지, 4:93, 1982.
 52. 임창준, 김종원: 상악절치부 치조골 분석절단 및 재식술이 치주조직에 미치는 영향에 관한 실험적 연구. 대한구강외과학회지, 8:99, 1982.
 53. 정필훈, 남일우: 편측성 하악전돌증에 대한 외과적 처치 전후에서의 하악운동에 관한 연구. 대한구강·악안면외과학회지, 10:257, 1984.
 54. 정필훈: 편측성 하악전돌증의 외과적 간편술식으로서의 하악골 중앙부 피개 골절단술. 대한구강·악안면외과학회지, 10:102, 1984.
 55. 정필훈, 정영택, 양수남: Modified LeFort III 골절단술을 이용한 협골 및 상악골 후퇴증의 악교정 외과적 처치. 대한치과의사협회지, 23:965, 1985.
 56. 진우정: 상악골 비대칭을 수반한 편측성 하악 거대증의 외과적 치험예. 대한악안면성형외과학회지, 6:89, 1984.

비대칭성 하악골 과성장의 악교정 외과적 처치에 대한 임상적 연구

충남대학교 의과대학 부속병원 치과·구강외과학교실

정 필 훈

.....>국문초록<.....

안모의 비대칭은 누구에게나 약간씩 존재하나 그 정도가 심해 환자 스스로 치료를 요할 경우 비대칭 안모라 칭할 수 있다.

하악골 비대칭에 의한 비대칭 안모는 하악골 과성장에 의한 경우와 하악골 왜소증에 의한 경우로 대별할 수 있다. 이 경우 저자는 21명의 하악골 과성장 환자를 비대칭 전돌증, 편측성 하악과두증식, 그리고 편측성 하악거대증으로 분류하여 각기 환자에 맞는 악교정 외과적 처치를 시행함에 있어서 임상적 고찰결과 다음과 같은 결론을 얻었다.

1. 21명의 비대칭성 하악골 과성장의 환자를 분류하여 보면 비대칭 전돌증이 14명, 편측성 하악과두증식이 3명, 그리고 편측성 하악거대증이 4명이었다.
2. 17명의 환자는 하악골에만 골절단술 혹은 골절제술을 시행하여 치료하였고, 3명은 상·하악 동시 수술을 하였으며 그중 2명은 Modified LeFortⅢ 골절단술에 의해 상악골 및 협골까지 전방이동을 시행하였다. 1명은 상악골에만 골절단술을 시행하여 치료하였다.
3. 한가지 흥미로운 점은 본 연구대상 환자 대부분의 경우 하악골 정중부가 좌측으로 전위하였으며 특히 비대칭 전돌증에서 좌측 전위 경향이 있었다는 점이다.
4. 비대칭성이 심하게 전위된 경우, 하악골 divergence angle이 150°정도까지 안되더라도 이환된 부위의 전위된 하악지 쪽의 시야는 비교적 좋기 때문에 이환된 부위부터 Intraoral Vertical Osteotomy 술식을 시행할 경우 수술이 비교적 용이한것 같다.
5. 모든 악교정외과적 술식은 환자의 기형과 요구에 맞으며 가능하면 간단한 술식으로 최대의 효과를 얻을수 있는 술식이어야 한다.

※ 본 논문은 1985년도 충남대학병원 임상 연구비의 보조를 받은 것임.