

## CASES OF THE SURGICAL CORRECTION OF FACIAL ASYMMERY

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*This is a case report and review of literature of the facial asymmetry corrected by various surgical methods.*

*In case 1, facial asymmetry resulted from osteochondroma of condyle and corrected via condylectomy only.*

*In case 2, unilateral condylar hyperplasia with compensatory maxillary growth resulted in severe facial asymmetry.*

*Procedures used in case 2 are vertical ramus osteotomy, condylectomy, genioplasty, mandibular inferior border ostectomy and Le Fort I osteotomy.*

### I. INTRODUCTION

In general, facial asymmetry may result from any unilateral neoplastic, traumatic, or developmental disturbance of the bone of the craniofacial skeleton.<sup>3)</sup> While the jaws are frequently the cause of facial asymmetry, other components of the face may also contribute to it. The mandible is a major contributor to facial asymmetry.

Since the mandible forms the bony support for the soft tissues of the lower face, even minor alterations in its position or shape can cause asymmetry.<sup>2)</sup> The maxilla provides little support for facial soft tissue and has only a small role in facial asymmetry.

Facial asymmetry in growing persons is, in the majority of instances, associated with hyperplasia of the mandibular condyle or hypertrophy of the entire involved side of the mandible.

In older persons, osteoma, osteochondroma, and other neoplastic conditions of condyle may produce facial asymmetry.<sup>15)</sup>

The earliest recorded case of facial asymmetry, at least in the english literature, was that of Mary Keefe, reported by Adams in 1836.<sup>2)</sup>

Gruca and Meisels<sup>13)</sup> reviewed 17 cases up to 1926

and emphasized the importance of early operation.

Rushton<sup>23)</sup>, in 1944, described the histologic features of the hyperplastic condyle.

The most extensive literature review of condylar hyperplasia is that Blomquist and Hogeman<sup>4)</sup>, Who reviewed 102 cases for which there was an essentially equal sex distribution.

Thereafter, a number of cases about facial asymmetry have been reported by Hinds,<sup>15)</sup> Bruce,<sup>5)</sup> Tarsitano,<sup>25)</sup> Blair,<sup>3)</sup> Ellis,<sup>10)</sup> Hall,<sup>14)</sup> etc.

Numerous surgical procedures have been advocated for facial asymmetry : condylectomy, sagittal split ramus osteotomy, vertical ramus osteotomy, subcondylar osteotomy, inferior body ostectomy of mandible, genioplasty Le Fort I osteotomy, etc.

In this paper, facial asymmetry patients due to condylar hyperplasia and osteochondroma of condyle are presented.

### II. REPORT OF CASES

#### Case 1

In november, 1988, a 36-year-old man was visited to our hospital, complaining of masticatory disturbance, facial

asymmetry and left TMJ discomfort.

The family history was not contributory. Examination revealed asymmetry characterized by deviation of the symphysis to the right side. There was posterior cross bite of right side and limitation of mouth opening (Fig 6). He had noticed progressive deviation of mandible with right posterior cross bite since several years ago.

Radiographs, including computer tomogram, revealed enlargement of left condyle and mandibular deviation to the right side (Fig 3). The findings of the remainder of the physical examination were insignificant. The clinical impression was condylar hyperplasia, rule out osteochondroma.

The panax view, lateral and true cephalometric analysis were performed, and model surgery and paper surgery were performed.

Treatment for this patient was planned to correct facial asymmetry through condylectomy.

The acrylic occlusal wafer was prepared. Through an extraoral approach, an incision was made in the left submandibular area. The ramus and condylar process was exposed. Surgical removal of enlarged condyle was performed with Pneumatic drill and saw. The enlarged condyle was easily dissected from capsule and removed (Fig 5).

The surgical specimen was submitted to the pathology department.

Microscopic diagnosis was osteochondroma.

### Case 2

In May, 22 1990, a 22-year-old man was visited to our hospital, complaining severe facial asymmetry and malocclusion.

Examination revealed asymmetry characterized by deviation of the symphysis to the right side, prominent chin, and the bowing of inferior border of left mandibular body (Fig 8). There were left posterior open bite, obtuse mandibular angle and occlusal canting due to compensatory maxillary growth.

Radiography, including computer tomogram, revealed left condylar hyperplasia with a generalized increase in half of the mandible, bowing of the inferior mandibular

body, open bite, occlusal canting, and deviated mandible to the right side (Fig 10, Fig 12).

The clinical impression was facial asymmetry with condylar hyperplasia and compensatory maxillary growth.

The intermediate wafer and final wafer were prepared.

For Le Fort I osteotomy, horizontal incision in the maxillary vestibule was made from the second molar region of one side to a similar area on the contralateral side. The flap was raised to expose the maxilla and bone of wedge shape was excised from left lateral maxilla to the contralateral side. The maxillary position was held with a previously designed acrylic occlusal wafer.

After Le Fort I osteotomy, Both vertical ramus osteotomy and left condylectomy were performed through submandibular incision.

To correct asymmetrical prominent chin, lateral sliding genioplasty was performed, and inferior body osteotomy of left mandibular body was done.

The mandibular position was held with a prepared final acrylic occlusal wafer and intermaxillary fixation was applied.

The surgical specimen was submitted to the pathology department. Microscopic diagnosis was condylar hyperplasia.

Six weeks later, the intermaxillary fixation was removed and physical therapy was begun. After physical therapy, mouth opening was satisfactory.

The postoperative facial appearance and occlusion were satisfactory (Fig 9, Fig 15).

The postoperative radiograph showed improvement of asymmetry, correction of the bowing at the inferior border of left mandibular body and correction of elongated left condyle (Fig 11, Fig 13).

### III. DISCUSSION

Facial asymmetry is present in everyone to some degree.

In most individuals, the degree of asymmetry is not noticeable.

Facial asymmetry can be the result of unilateral neoplastic, traumatic, or developmental disturbance of the cra-



Fig. 1. Preoperative facial appearance of the patient in case 1, who had condylar osteochondroma.



Fig. 2. Postoperative facial appearance of the patient in case 1.

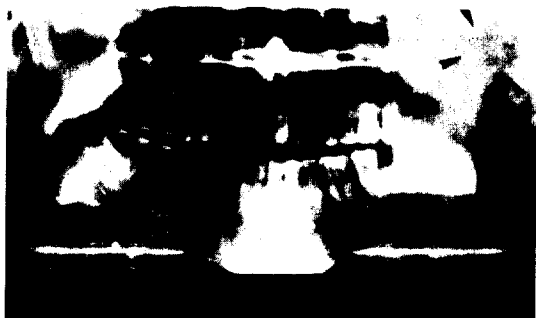


Fig. 3. Preoperative panoramic radiograph of case 1. Note the enlarged left condylar head.



Fig. 4. Postoperative true cephalogram of case 1.



Fig. 5. Resected tumor mass of case 1.



Fig. 6. Preoperative intraoral view of case 1. Note the posterior cross bite.

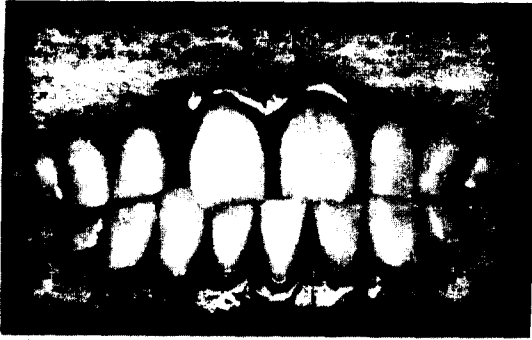


Fig. 7. Postoperative intraoral view of case 1.



Fig. 8. Preoperative facial appearance of the patient in case 2, who had unilateral Condylar hyperplasia and compensatory maxillary growth.



Fig. 9. Postoperative facial appearance of the patient in case 2.

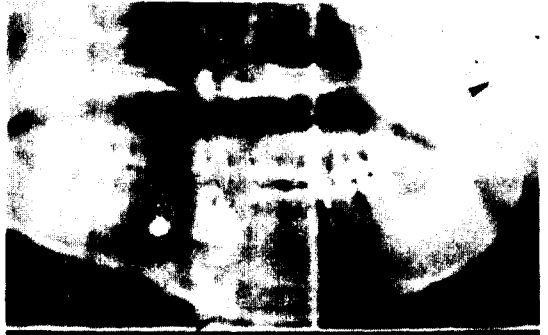


Fig. 10. Preoperative panoramic radiograph of case 2. Note the elongated Condylar neck and the bowing at the inferior border of mandible.



Fig. 11. Postoperative panoramic radiograph of case 2.



Fig. 12. Preoperative true Cephalogram of case 2. Note the elongated Condylar neck and the deviated mandible.

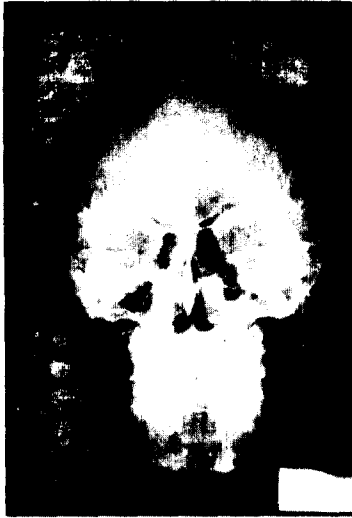


Fig. 13. Postoperative true Cephalogram of case 2.



Fig. 14. Preoperative intraoral view of case 2.

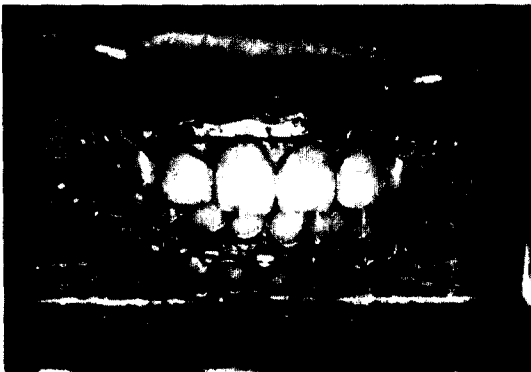


Fig. 15. Postoperative intraoral view of case 2.

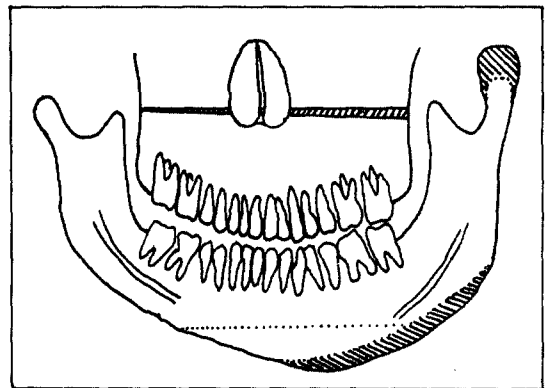


Fig. 16. Schematic drawing of Surgical Correction of Case 2.

niofacial complex.

The mandible is a major contributor to facial asymmetry.

Some causes of mandibular asymmetry are as follows<sup>2)</sup>: condylar hyperplasia, condylar agenesis, fibrous dysplasia.

The first unilateral condylar hyperplasia was reported and described in 1836 by Adams, who associated the hyperplastic condyle with rheumatoid arthritis.<sup>5)</sup> Since then, many cases have been reported in literature, including those of Gruca and Meisels,<sup>13)</sup> Bruce,<sup>5)</sup> Weinstein.<sup>28)</sup>

Unilateral condylar hyperplasia may produce a variety

of conditions such as laterognathia, deviation prognathism, unilateral macrognathia, and compensatory maxillary growth.<sup>5)</sup> Rushton<sup>23)</sup> related the type of mandibular laterognathia to the period of time of abnormal condylar growth.

He stated that any unilateral condylar overgrowth would be compensated by secondary alveolar growth of the maxilla as a means to a functional dental occlusion. In case 2 of this paper, compensatory maxillary growth occurred with unilateral condylar hyperplasia (Fig 8).

Mandibular asymmetry can be classified into three types: Deviation prognathism, Unilaterally enlarged condyle or condylar neck or both, and unilateral mandibular

hyperplasia with or without compensatory maxillary and mandibular dentoalveolar adaptation.<sup>5)</sup>

The most common deformity is deviation prognathism, a condition in which there is not only a generalized proportionate increase in mandibular size but also an increased unilateral growth component.

Unilateral condylar hyperplasia manifested by an enlarged head or elongated neck of the condylar process or both.

Unilateral mandibular hyperplasia involves an entire half of the mandible and manifested by bowing of the inferior mandibular body, open bite, compensatory maxillary growth, and deviation of the teeth from the affected side of the mandible.

The second case of this paper classified into unilateral mandibular hyperplasia.

Also, neoplastic condition of condyle may produce facial asymmetry. In the first case of this paper, facial asymmetry occurred with condylar osteochondroma (Fig 1).

The osteochondroma is the most common of all benign tumors of bone.<sup>6,19)</sup>

The cartilage usually forms a mushroom shaped cap over the projecting bony portion. It develops at sites where cartilage is usually found in regions of insertion of tendons.<sup>6,8)</sup> The osteochondroma is seen in both solitary and multiple hereditary form. Sarcomatous changes in the solitary lesions occur in approximately 1% of cases whereas an 11% incidence has been reported in patients with multiple mass.<sup>10)</sup> The most frequent location of osteochondroma is in the long bones (especially the tibia and fibula). Also osteochondroma have been reported in the rib, clavicle, scapula, vertebra, maxilla, and mandible.<sup>18)</sup> In the oral cavity, the coronoid process of the mandible is most frequently involved.<sup>22)</sup> Osteochondroma of the mandibular condyle is a rare tumor. Lichtenstein<sup>19)</sup> mentions that the cases may be perverted activity of the periosteum, which tends to form anomalous foci of metaplastic cartilage. These foci then produce the exostosis by growth and endochondral ossification. Osteochondroma of condyle has reported by Curtin and Greeley,<sup>7)</sup> Melarkey,<sup>21)</sup> Keen,<sup>17)</sup> Wang-Norderud and Ragab,<sup>27)</sup> Koehl,<sup>18)</sup>, etc.

Treatment planning for facial asymmetry is important. Because facial asymmetries are three-dimensional anomalies,<sup>10)</sup> it is important to appreciate vertical, anteroposterior, and transverse components. In this paper, Panex view, true and lateral cephalogram was used and dental articulator transferred by face-bow was used in analysis and model surgery.

Unilateral condylectomy has been the accepted method for the correction of unilateral condylar asymmetries. Currently, the main indication for condylectomy are active condylar hyperplasia : benign tumors of the condylar head : previous condylar fractures producing symptoms, limited function, or ramus shortening : and intra-articular ankylosis requiring osteoarthrectomy.<sup>20)</sup> The first resection for condylar hyperplasia was described by Humphrey in 1856,<sup>12)</sup> and the procedure has been the operation preferred by most subsequent authors : Gottlieb,<sup>10)</sup> Bell,<sup>2)</sup> Beirne,<sup>1)</sup> Tasanen<sup>20)</sup>, etc.

About time of treatment, Gruca and Meisels<sup>12)</sup> advocated early condylectomy to prevent progressive facial deformity.

Tarsitano et al<sup>25)</sup> advocated late condylectomy until completion of growth and relied heavily on orthodontic consultation.

Generally, time of treatment has been delayed until completion of growth, except tumor growth. In the first case of this paper, unilateral condylectomy only was performed.

Asymmetry is not always well corrected because the position of the maxilla, through occlusion, also determines the position of the mandible. Maxillary repositioning is the key to correction of facial asymmetry. When the occlusal plane is canted, maxillary osteotomy accompany with mandibular osteotomy. In the second case of this paper, the maxilla was realigned to the skull in a symmetrical manner by performing Le Fort I osteotomy. This combination of procedures permits positioning of the maxillary and mandibular complex with consideration for facial esthetics, as well as stability and biomechanical function.

As additional methods for correction of asymmetry, inferior border osteotomy, genioplasty, and mandibulopla-

sty can be used. A procedure for contouring of the bone along the inferior and lateral mandibular borders for reduction of bony overgrowth of the body of the mandible was described in 1963 by Dingman and Grabb.<sup>9)</sup> In the second case of this paper, inferior border osteotomy, genioplasty, and mandibuloplasty were performed for correction of the bowing at the inferior border of the mandible and prominent chin(Fig 16).

#### IV. SUMMARY

Facial asymmetry reported in this paper was asymmetry due to unilateral condylar hyperplasia and condylar osteochondroma.

In the first case, facial asymmetry due to condylar osteochondroma was corrected by unilateral condylectomy.

In the second case, facial asymmetry due to unilateral condylar hyperplasia treated by Le Fort I osteotomy, vertical ramus osteotomy, condylectomy, inferior border osteotomy of mandibular body and genioplasty. The postoperative facial appearance and mandibular function were relatively satisfactory.

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국문초록

## 비대칭 안모의 외과적 치험례

국군수도병원 · 구강악안면외과  
허홍열 · 민승기 · 조상기 · 정인원

안모비대칭은 심미적 정서적으로 영향을 줄 뿐만 아니라 기능적인 장애를 초래하는 경우도 있다. 안모비대칭은 안면골 중에서 특히 하악골과 관련된 경우가 많은데 이는 하악골이 안면하부의 연조직을 지지하므로 작은 위치, 형태 변화에도 두드러지게 나타나기 때문이다.

비대칭안모를 초래하는 하악과두의 거대증은 Hyperplasia, Hypertrophy, 골증, 외골증, 골연골증, 연골육종 등을 들 수 있다. 비대칭안모 분류는 여러 학자에 의해 다양하게 분류되지만 Bruce와 Hayward는 Deviation prognathism, Unilateral macrogathia, Unilateral condylar hyperplasia로 분류한 바 있다.

과증식된 하악과두의 절제술은 1856년 Humphry에 의해 최초로 시행된 후 여러 학자들에 의해 성공적으로 시행되고 있다. 본 증례에서는 Unilateral condylar hyperplasia와 골연골증으로 인한 안모비대칭 환자로써 Condylectomy, Le Fort I osteotomy, Vertical ramus osteotomy, Mandibular inferior border ostectomy, Genioplasty 등을 시행하여 심미적 기능적으로 양호한 결과를 얻었기에 이를 보고하는 바이다.