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A Case of Facial Asymmetry due to Condylar Hyperplasia- A Treatment Strategy for Active Condylar Hyperplasia-

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Abstract Unilateral condylar hyperplasia of the mandible is relatively rare. Condylar hyperplasia (CH) is classified into two types, active and inactive CH, using histopathological criteria. Treatment plans should be drawn up according to the type of CH present. In cases involving high CH activity, high condylectomy is recommended. In addition, the extent of the expected deformity should be considered in order to improve facial symmetry and occlusion. Thus, simultaneous orthognathic surgery is also necessary in such cases.

Key words: condylar hyperplasia, high condylectomy, two-jaw surgery

Introduction

Unilateral condylar hyperplasia of the mandible is a relatively rare condition. Its main symptoms are functional disturbance of the temporomandibular joint (TMJ), facial asymmetry, and malocclusion. Condylar hyperplasia (CH) is classified into two types on the basis of histopathological criteria,[1] active CH, in which the abnormal growth is ongoing, and inactive CH, in which the abnormal growth has finished. Treatment plans should be drawn up according to the type of CH present. Wolford et al.[2] recommended the use of high condylectomy in patients with active CH in order to avoid relapse. In addition, the extent of the expected deformity should be considered in order to improve facial symmetry and occlusion. For active unilateral CH, two-jaw surgery combined with high condylectomy might be an appropriate treatment strategy; however, there are few reports about this method.

This report presents a case of active unilateral CH that was treated with surgical excision of the mandibular condyle and simultaneous two-jaw surgery, and the 3-year follow-up results are also described.

Case

A 32-year-old female was referred to our clinic with complaints of malocclusion and facial asymmetry. She started orthodontic treatment at the age of 31 because she noticed mandibular deviation (Fig. 1). Her left TMJ was painful and made a clicking sound when she opened her mouth. During her first visit, we found that the mandibular midline was located 6 mm to the right, and her maximum mouth opening was 25 mm. She displayed an overbite of 0.5 mm and an overjet of 0.5 mm (Fig. 2). Inclination of the maxillary occlusal plane also observed. A radiopaque area with a similar density to the adjacent bone in the left condyle was observed on an orthopantomogram. A CT scan demonstrated hypertrophy of the left condylar head (Fig.

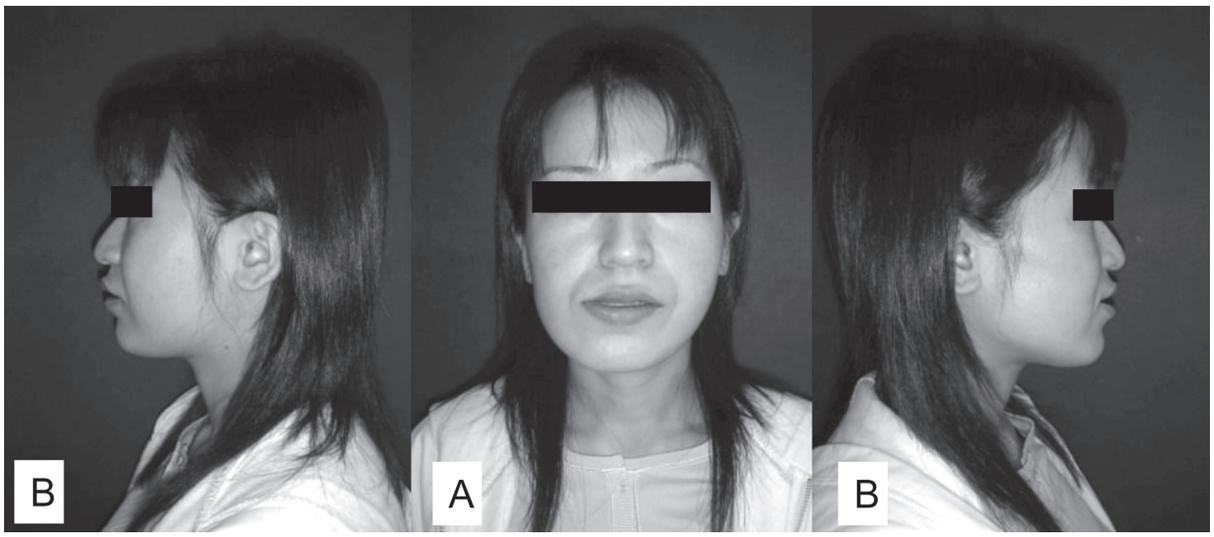

Fig. 1 Facial appearance at the first visit (A: frontal, B: lateral).
Her chin had shifted to the right.

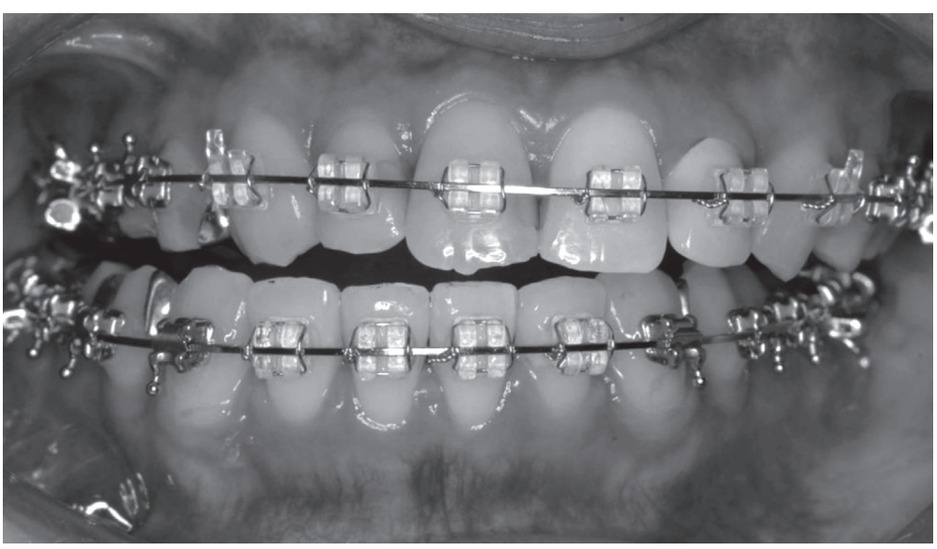

Fig. 2 Intraoral photograph taken at the first visit.
The mandibular midline was shifted 6 mm to the right.

3), and a technetium-99m scintigram showed a hot spot in the left TMJ, but a gallium scintigram did not detect any areas of abnormal activity (Fig. 4). The patient was diagnosed with active condylar hyperplasia. A 3D graphic model was prepared from the CT data, and the patient's ramal height was measured. Her right and left rami measured 67 mm and 85 mm in height, respectively. Under general anesthesia, left condylectomy using an Al-Kayat-Bramley incision, sagittal split ramus osteotomy (SSRO) with rigid fixation on the right side, and Le Fort I osteotomy to improve the inclination of the maxillary occlusal plane were performed simultaneously. An area of the condylar head measuring approximately 17 mm in length was resected, and the articular disk was preserved. The articular disk was found to have a 5 mm perforation, but was successfully repositioned. Maxillo-mandibular fixation (MMF) was performed 1 week after the operation. The pathological diagnosis was condylar hyperplasia. The patient's occlusion remained stable after the MMF was released. Frontal cephalograms were taken before the operation (T0);

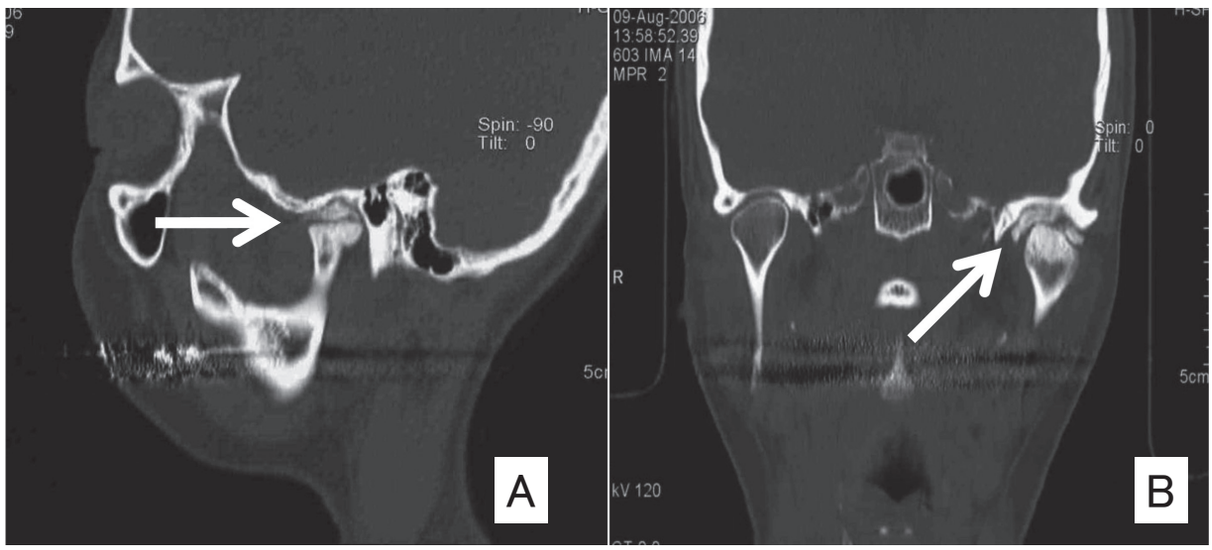

Fig. 3 Computed tomography (A: sagittal, B: coronal).
A CT scan showed hypertrophy of the left condylar head.

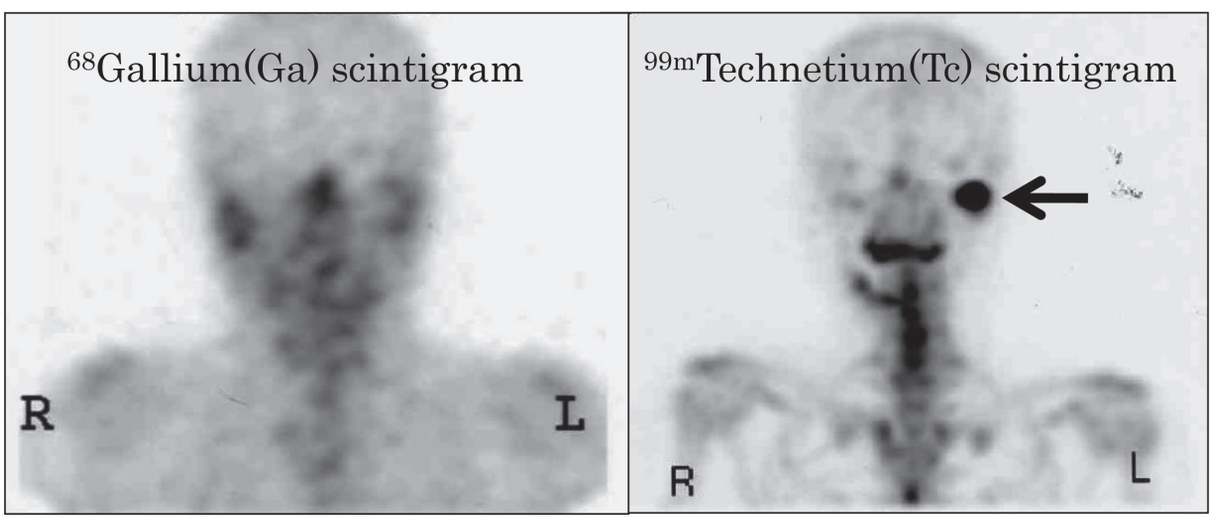

Fig. 4 Technetium-99m and gallium scintigrams.
A technetium-99m scintigram showed a hot spot in the left TMJ; however, a gallium scintigram did not detect any areas of abnormal activity.

3 days after the operation (T1); and 1 month (T2), 3 months (T3), 6 months (T4), 1 year (T5), and 3 years (T6) after the operation and evaluated (Figs. 5, 6). There was no obvious difference in mandibular position between T1 and the other time points except for T0 (Table 1). The maximum interincisal distance was 36 mm at T4. The pain in the left TMJ disappeared after about two postoperative weeks. A Schuller projection demonstrated that the position and movement of the left condyle were good. The patient's TMJ symptoms were ameliorated, and no signs of infection were recognized on MRI obtained one year after the operation. Facial symmetry and good occlusion were maintained at both 3 months and 3 years after surgery without functional disturbance of the TMJ (Fig. 7).

Discussion

Condylar hyperplasia (CH) was first described by Adams[3] in 1836, who found that it led to overdevelopment of the mandible, usually creating significant functional and esthetic deformities. The cause of CH re-

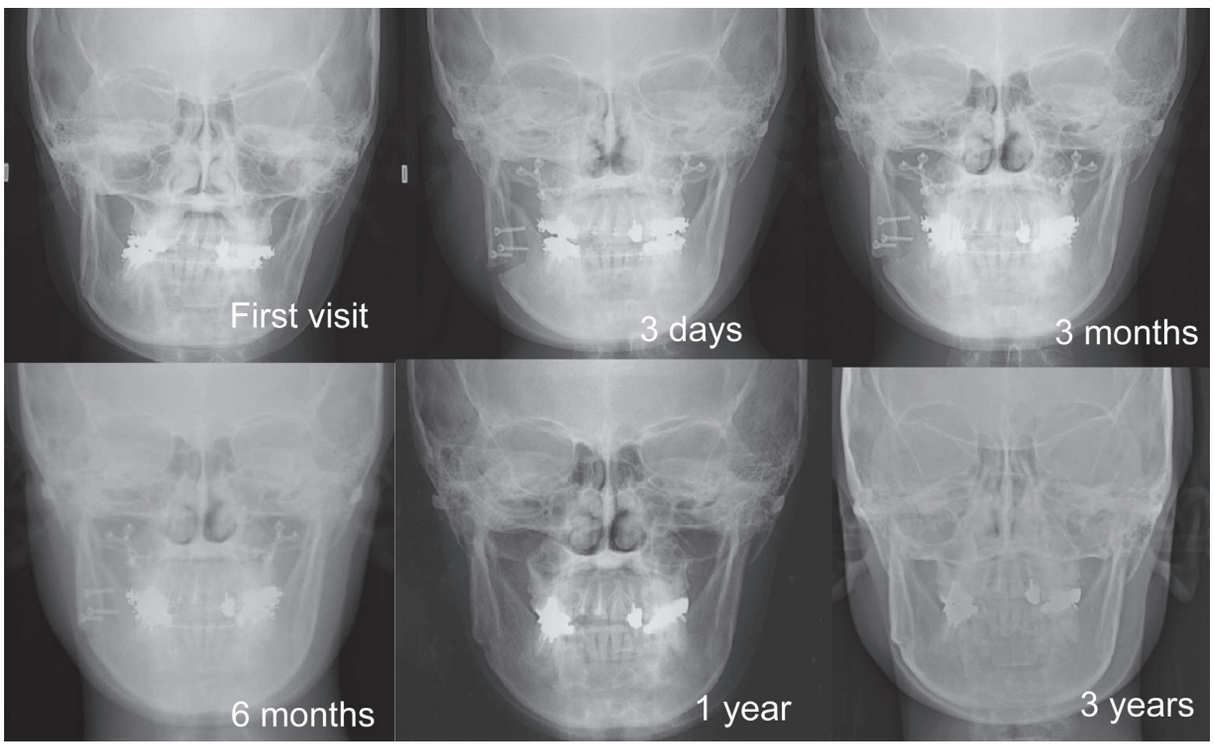

Fig. 5 Frontal cephalograms.
Postoperative frontal cephalograms did not display any significant changes.

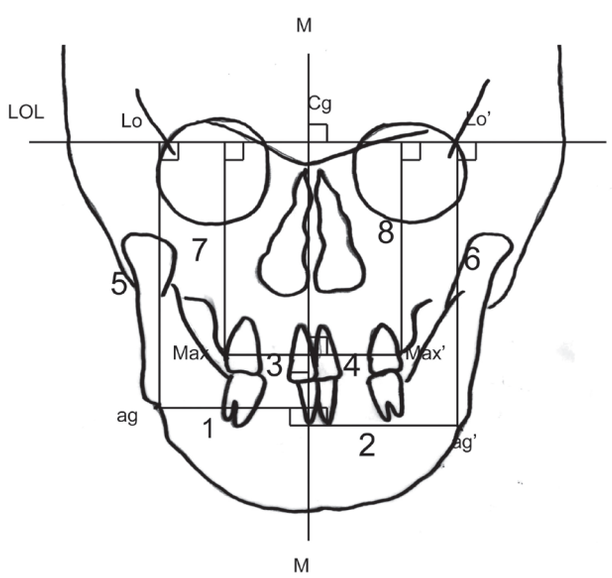

Fig. 6 Cephalometric analysis.
Lo: the intersection of the lateral orbital contour, Cg: the center point of the Crista galli, Max: the inferior meeting point of the maxillary alveolar bone with the upper first molar, ag: the highest point of the antegonial notch of the mandible, LOL line: the line connecting the Lo positions on the right and left sides, M line: the line perpendicular to LOL through Cg

1,2: the line perpendicular to the line from ag to M
3,4: the line perpendicular to the line from Max to M
5,6: the line perpendicular to the line from ag to LOL
7,8: the line perpendicular to the line from Max to LOL

Table 1

	1	2	3	4	5	6	7	8
T1	55	39	29	25	103	111	73	75
T2	47	39	29	27	105	103	72	72
T3	47	47	25	27	101	98	71	72
T4	49	46	28	27	100	99	72	72
T5	47	47	29	26	102	100	71	71
T6	51	50	29	31	105	105	73	72

(mm)

T1: before surgery, T2: within 1 week of intermaxillary fixtation,
T3: 3 months after surgery, T4: 6 months after surgery,
T5: 1 year after surgery, T6: 3 years after surgery

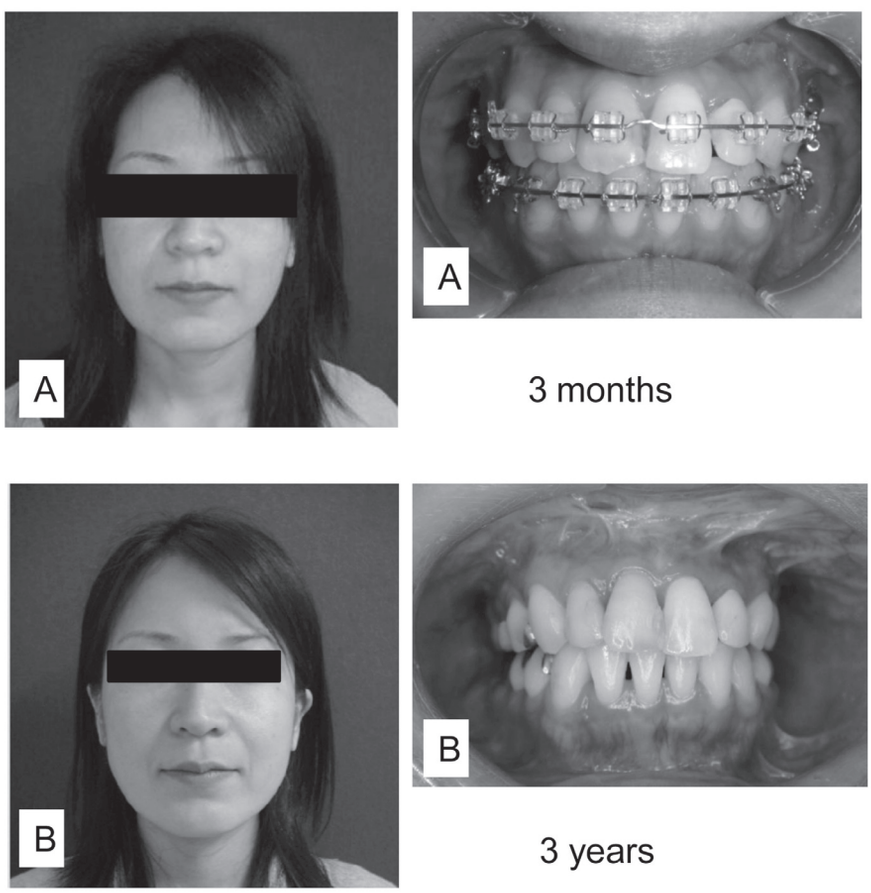

Fig. 7 Postoperative facial photographs and intraoral view (A: 3 months, B: 3 years postoperation).

Facial symmetry and good occlusion were maintained at both 3 months and 3 years after surgery without functional disturbance of the TMJ.

mains unclear, although the most likely explanations are: 1) circulatory problems, 2) previous trauma, 3) hormonal disturbances, 4) abnormal loading, and/or 5) cartilaginous exostosis.[4-6] The differential diagnoses of condylar lesions generally include CH, giant cell tumor, fibroosteoma, myxoma, fibrous dysplasia, fibrosarcoma, chondrosarcoma, osteoma, chondroma, and osteochondroma.[7]

CH is divided into two histopathological types, the active type and the inactive type.[8] Diagnosis is usually achieved through clinical and radiographic examinations, and the treatment of unilateral CH will depend on whether the condyle is still growing.[9] This can be determined by scintigraphy or comparisons of serial cephalometric radiographs taken at about 6-month intervals. In particular, bone scanning with technetium 99M pyrophosphate or technetium 99M methylene diphosphonate can detect active growth in the condyle.[9-12]

Generally, non-surgical treatment (orthodontic treatment alone) or orthognathic surgery is used for inactive CH because the mandibular condyle does not need to be treated. For the active type of CH, previous reports suggested 1) excision of the mandibular condyle alone or 2) excision of the mandibular condyle combined with orthognathic surgery (1 or 2 stages). Wolford et al.[2] reported that all patients with active CH relapsed into skeletal and occlusal Class III relationships and required secondary intervention to correct the resultant deformities. Thus, Carlson recommended initial high condylectomy followed by secondary orthognathic surgery for active CH.[13] However, performing two operations imposes a greater burden on the patient because the malocclusion and asymmetry are not improved by the first operation and prolonged malocclusion can influence the contralateral TMJ. Due to advances in medical technology, it has recently become possible to perform surgical excision of the mandibular condyle and orthognathic surgery simultaneously. However, in such cases the orthognathic surgery is mainly focused on the mandible. In our experience, most patients with CH need two-jaw surgery. Thus, a single operation was performed for our case of CH; i.e., surgical excision of the mandibular condyle and two-jaw surgery were performed simultaneously. The operation time should be shorten is better because this method is very complicated and technically demanding. Consequently, the mandibular condyle excision volume was determined before the operation using 3-D computed tomography. As a result, the operation time was reduced to 5 hours 25 minutes.

In this method, achieving a stable mandibular position is of primary importance. In the present case, follow-up examinations involving frontal cephalographs, maximum interincisal opening measurements, and Schuller X-ray photograms were performed for two years. Long-term follow-up did not detect any undesirable changes in subjective or objective jaw function, and the patient's mean maximum interincisal opening measurement remained the same or even increased between examinations. No significant TMJ pain was reported. Thus, this method is a suitable treatment strategy for active type condylar hyperplasia.

Conflict of Interest

The authors state no conflict of interest.

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