

## Hyperplastic conditions of the mandibular condyles

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### ABSTRACT

**Purpose** : To evaluate the clinical and radiographic features of unilateral hyperplastic mandibular condyles for some useful preliminary diagnostic recommendations.

**Materials and Methods** : Clinical records, radiographs and histologic diagnoses of 35 cases with asymmetric mandibular condyles due to apparent unilateral condylar hyperplasia were evaluated retrospectively.

**Results** : Among 35 cases, 28 were true hyperplastic conditions of condyles whereas the remaining 7 were unilateral internal derangement occurring on the short side. 17 of the 28 hyperplastic condyles showed a mass or irregular radiographic shadow with histologic diagnosis including osteochondroma and osteoma. Only 5 of these cases showed facial asymmetry. 2 out of the 17 cases showed hyperplastic round shaped irregular condyles consistent with ankylosis and their histologic diagnoses were osteochondromas. 11 of the 28 cases showed smooth enlargement of condylar head with elongation of the neck causing facial asymmetry, but histologic diagnoses were not available because the surgical operation conserved the condyles.

**Conclusion** : The hyperplastic conditions of the mandibular condyles include not only true hyperplasia, osteochondroma, osteoma, and ankylosis, but also unilateral internal derangement occurring on the short side. (*Korean J Oral Maxillofac Radiol* 2003; 33 : 207-9)

**KEY WORDS** : Mandibular Condyle; Hyperplasia; Osteochondroma; Temporomandibular Disorders

Common use of panoramic radiography gives more chance to check jaw bone asymmetry comparing the sizes of both mandibular condyles. Mandibular asymmetry may be caused by a number of factors. One cause that is commonly encountered is unilateral condylar hyperplasia.<sup>1</sup> And even though an osteochondroma of the facial bones is a rare finding, condylar osteochondromas have been reported.<sup>2-12</sup>

Condylar hyperplasia is reported to be a self-limiting process that can cease active growth at anytime and is generally seen in patients between the ages of 11 and 30 years age; it appears as an acceleration of growth in young patients that arises at the same time of physiologic condylar growth, or as an unpredictable growth spurt in adults.<sup>13-15</sup> Loftus et al.<sup>2</sup> reported that the osteochondromas arising from the condyle is usually lobulated or irregular in contour and causes a deformation of the normal condylar morphology and this is distinctly different from the elongation of the condyloid process seen in condylar hyperplasia. But Iannetti et al.<sup>15</sup> said that the mandibular condyle must be considered as a growth center

that has a multidirectional potential of growth, as confirmed by histologic and physiologic studies, and condylar growth appears to undergo, in condylar hyperplasia, an unpredictable and unjustified enlargement because of the action of an undetermined growth regulator or stimulus.<sup>16</sup> The multidirectional growing mechanism of the condyle causes not only the elongation of the condyle but also a significant variation in its morphology.<sup>2</sup>

Tumorous growth like osteochondroma mostly requires surgical excision through condylectomy<sup>11</sup> but not for condylar hyperplasias. However Matteson et al.<sup>14</sup> pointed that condylar hyperplasia poses a problem in planning treatment because it is a self-limiting process for some but not all patients. Continued growth creates a progressive deformity that requires condylectomy, whereas an enlarged condyle can be left in place after hyperplastic growth ceases, even if ramus surgery is needed to correct asymmetry. Obwegester and Makek<sup>16</sup> insisted the term 'condylar hyperplasia' refers to hyperplasia of the condyle alone and should not be used to mean hemimandibular hyperplasia or hemimandibular elongation.

Though the precise differentiation of these conditions may be confusing, clinical environment requires radiographic impressions at first hand before any other data are available. 35

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cases of patients which had apparent condylar size discrepancy possibly due to unilateral condylar hyperplastic condition were collected and evaluated retrospectively for some useful preliminary diagnostic recommendations.

### Materials and Methods

Clinical records, radiographs and histologic diagnoses of 35 cases with asymmetric mandibular condyles due to apparent unilateral condylar hyperplasia were evaluated retrospectively. Since Obwegester and Makek<sup>16</sup> referred the condylar hyperplasia to hyperplasia of the condyle alone and differentiated hemimandibular hyperplasia and hemimandibular elongation, both sizes of mandibular body, ramus height and width were grossly compared to check for the facial asymmetry. The panoramic radiographic images were traced on tracing papers and the measured widths of both mandibular first molars were used as guides for compensating image enlargement differences.

### Results

Among 35 cases, 28 were true hyperplastic conditions of condyles whereas 7 were unilateral internal derangement occurring on the short side. 17 of 28 hyperplastic condyles showed mass or irregular radiographic shadow. Since most of these patients prefer the follow-up checks to surgical operation, histologic diagnosis was available in only 6 of 17 cases and these include 4 osteochondromas, 1 osteoma, and 1 normal condylar tissues. Only 5 of these showed facial asymmetry.

2 of 17 showed hyperplastic round shaped irregular condyles consistent with ankylosis. These two cases received surgical operation and their histologic diagnoses were both osteochondromas.

Meanwhile 11 of 28 true hyperplastic conditions of condyles showed smooth enlargement of condylar head with elongation of neck inevitably causing facial asymmetry. The shapes of the enlarged condyles were not always consistent with those of the normal condyles and sometimes showed quite different outline but without any attached mass shadow. Some surgical operations were done to correct facial asymmetry but histologic diagnoses were not available because the operation conserved the condyles. 7 of 35 cases were unilateral internal derangement occurring on the short side. The affected side mostly preserved the normal contour of condyle making the other normal side appear to be larger.

### Discussion

Clinical and radiographic observations indicate that mandibular asymmetry may be the result of either accelerated growth of the mandibular condyle on one side or decreased growth on the opposite side.<sup>17</sup> It is not surprising this study included cases with internal derangements. Tallents et al.<sup>17</sup> studied twelve patients presenting with facial asymmetry, thought to represent unilateral mandibular condylar hyperplasia and noted two distinct patients: (1) with apparent condylar hyperplasia and (2) with unilateral internal derangements. Six patients were found to have normal TMJs bilaterally and six had unilateral internal derangement occurring on the short side. Angular and linear measurements were compared using Student's t test for discrete variables between the two groups and ANOVA for continuous variables; however, they were unable to demonstrate any set of circumstances that would suggest differences between the two groups. The only clear distinction was the presence of degenerative joint disease on the short side. In this study the affected side mostly preserved the normal contour of condyle without any typical degenerative bony changes making the other normal side appear to be larger. Therefore with abnormal radiographic findings like degenerative joint disease, history of clicking, history of locking, and/or pain on the short side also should be considered as to the etiology of the mandibular asymmetry.

The osteochondroma of the condyle appears as a cartilage-capped exostosis arising from the condyle. Grossly, the lesion is usually lobulated or irregular in contour and causes a deformation of the normal condylar morphology. This is distinctly different from the elongation of the condyloid process seen in condylar hyperplasia.<sup>2,10</sup> In this study one typical osteochondroma-like case showed normal histologic appearance. This could be an inactive case of condylar hyperplasia for during active growth of hyperplasia, proliferation of the condylar cartilage is noted but once condylar growth has ceased, the condyle has a normal histologic appearance.<sup>13</sup> Loftus et al.<sup>2</sup> studied cases of osteochondromas and felt the clinical and histological presentation was distinctly different from that of condylar hyperplasia. Osteochondroma has the form of a discrete osteocartilagenous exostosis with no cartilage islands seen in the underlying trabeculae, this, however, is a consistent finding in condylar hyperplasia. In this study two cases of ankylosis had the same histologic appearance as osteochondromas.

Osteomas are benign tumors composed of mature compact

or cancellous bone and essentially restricted to the craniofacial skeleton and are rarely, if ever, diagnosed in other bones. Periosteal osteomas present as slowly growing masses on the surface of the mandible or maxilla. Some types may reach a large size, resulting in facial deformity. An osteoma involving the mandibular condyle may cause a slowly progressing shift in the patient's occlusion, with deviation of the midline of the chin toward the unaffected side. These condylar lesions are considered by some to represent osteomas; others designate them as hyperostoses.<sup>18</sup> In this study the case of osteoma involved a 21-year-old male as an actively growing lesion with positive bone scan findings.

Most of the patients with unilateral condylar hyperplastic conditions prefer follow-up checks to immediate operation so the histologic results were not very much available. Moreover most of the patients with possible condylar hyperplasia received a surgical operation with their condyle heads untouched. Facial asymmetry was less prominent in osteochondroma-like group than condylar hyperplasia-like group. Kurita et al<sup>11</sup> noted that osteochondroma is a cartilage-capped bony growth protruding from the surface of the affected bone and seldom occurs in the condylar area and, if it does, it is usually located at the medial surface. Also Peroz et al.<sup>12</sup> found the osteochondromas most often on the medial aspect of the mandibular condyle (57%), followed by an anterior (20%), and rarely in lateral or superior positions (less than 1%). Obwegester and Makek<sup>16</sup> insisted the term 'condylar hyperplasia' refers to hyperplasia of the condyle alone and should not be used to mean hemimandibular hyperplasia or hemimandibular elongation. In this study however it was not easy or possible to differentiate these using only radiographic materials. Mutoh et al.<sup>19</sup> found the two basic classification by Obwegeser and Makek<sup>16</sup> considering only the occlusal relationship, tilting of occlusal plane and degree of mandibular enlargement were not sufficient to analyse the morphological characteristics of the deformity. In their three-dimensional analysis of condylar hyperplasia with computed tomography,<sup>19</sup> they proposed unilateral hybrid forms but they admitted these also vary from case to case even in the same classification.

The diagnosis and treatment of mandibular asymmetry are quite difficult because of the morphological complexity of the deformity. Thus clinical and radiographic observations could only differentiate the gross guidelines already exists as the osteochondroma of the condyle appears as usually lobulated or irregular in contour and causes a deformation of the normal condylar morphology but these could include some of the

condylar hyperplasia with unpredictable and unjustified enlargement.

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