

A Case of Acquired Unilateral Mandibular Condylar Hypoplasia

by P H Burke BDS HDD DDO (*Newcastle upon Tyne*)

The importance of the head of the condyle as the main growth centre of the mandible was first fully realized by Wilson Charles (1925). Its significance in producing facial deformity when there is interference with this growth centre due to trauma or infection has been fully described by Rushton (1944) and Greer Walker (1957).

Case Report

FB, female, now aged 22 years 7 months. There was no family history of facial deformity. Birth weight and delivery had apparently been normal. She had suffered no injuries or illnesses other than the usual ailments of childhood until the age of 4 years 9 months. At that time she was standing underneath a see-saw and sustained a blow on the right malar region from the descending see-saw. There are no details of the immediate effects of this injury but she later developed a discharge from the right ear.

On examination at the age of 6 years 3 months: Face asymmetrical, chin displaced to the right, left lower cheek region flat, seals lips by contracting mentalis. On opening the mouth no limitation of movement but deviation more marked: left condyle moves normally but right condyle does not pass forward on to eminentia. Facial growth otherwise normal.

Study models showed an Angle's Cl.II arch relationship and the presence of a maxillary overjet of 7.8 mm (Fig 2A). Later records showed a progressive increase in the facial asymmetry, the maxillary overjet and a developing deviation of the mandibular dental mid-line to the right (Figs 1B & 2B).

At the age of 11 years 6 months an oblique lateral mandibular radiograph of the right side showed a rudimentary condylar head and a boss of bone on the inferior surface of the temporal bone. The head of the condyle appeared to be displaced inferiorly and anteriorly, the gonial angle of the mandible appeared less than 90 degrees and the coronoid process was apparently prolonged. In addition to the reduction in vertical height of the ramus the interference in antero-posterior growth of the mandible was shown by the reduction in the distance between second premolar and the posterior border of the ramus. Unerupted in this area were the three permanent molar teeth.

Interpretation of a cephalometric lateral skull radiograph taken at the same age confirmed this displacement of the condylar head downwards and forwards (Fig 3A). The lower border of the

body of the right mandible ascended steeply posteriorly and was reduced in length.

A postero-anterior skull radiograph recorded at the same age (11 years 6 months) showed deficient bone growth of the right mandible, the displacement of bony and dental mid-lines with tilting of the incisors to the left and the abnormal form of the right condylar head and neck: the latter was medial and posterior to the coronoid process (Fig 3B). These bony deformities of the mandible agree with the experimental findings of Sarnat & Engel (1951) after excision of the condylar head in the monkey. The inferior surface of the temporal bone was lower on the right side.

At this stage the surgical removal of the right second and third mandibular molar teeth was undertaken by Mr (now Professor) Hopper.

By the age of 13 years 2 months the maxillary overjet was 10.2 mm and the shift of the lower dental mid-line to the right was half the width of the right maxillary central incisor.

Orthodontic treatment was begun at the age of 13 years 6 months. After the extraction of maxillary first premolar teeth, elastic intermaxillary traction was applied using a metal cap splint in the lower arch and a free-sliding labial bow in the upper arch. When the maxillary overjet was reduced to 2.5 mm some seven months later the patient was placed in retention (Fig 2c). All appliances were discarded at the age of 15 years 4 months.

At the age of 16 years 4 months the patient was again referred to Mr Hopper and he and Mr R C Bell carried out an onlay bone grafting operation. A bone graft 2½ in. long and 1 in. deep from the right hip was inserted into a subperiosteal pocket on the lateral aspect of the body of the mandible on the left side. This was intended to be the first stage only of the plastic surgery reconstruction; the second stage was to have been a repositioning of the soft tissues of the chin restoring the mid-line. In the event, when the first stage was completed the patient expressed herself entirely happy with the result obtained by the onlay operation. Mr Hopper therefore confined his treatment to the removal of the remaining unerupted right first permanent molar.

The change in facial appearance between the age of 16 years (after orthodontic treatment and just before the onlay bone graft) and 22 years (six years after the operation) is evident (Fig 1c & d). This patient has suffered a further separate piercing injury of the right eye.

The occlusion has remained stable and the lower dental mid-line is now deviated to the right almost the whole width of the maxillary central incisor (Fig 2d). There is no periodontal disease. A lateral skull radiograph taken at this age, i.e. 22 years, shows clearly the abnormal form and



Fig 1 Facial views at ages 10 years 5 months (A), 11 years 9 months (B), 16 years (C) and 22 years 7 months (D)

position of the condylar head and that the formerly steeply inclined lower border of the body of the mandible on the right side is now normally inclined to the face and the deficiency in length is not so pronounced (Fig 3C).

When this tracing is superimposed on the tracing of the radiograph taken at 11 years, using the landmarks 'sella' (S) and 'nasion' (N) for orientation, the extent of the growth and treatment changes can be appreciated (Fig 3D). The apparent absence of growth changes affecting the

left mandible is explained by the compensatory adjustment of bone from the normal to the deficient right side across the mid-line thereby causing deviation of the bony and, to a lesser degree, the dental mid-lines. It would therefore appear that in this patient only a partial interference has occurred in the pattern of growth of the condylar head on the right side.

Comment

A point of interest is the decision regarding the timing and nature of the surgical treatment and its integration with the orthodontic treatment. The alternatives are:

(1) To restore the mandibular dental base to at least its correct relationship with the maxillary dental base by osteotomy and bone-grafting operations in the mixed dentitional stage so that the permanent dentition can take up a satisfactory occlusion.

(2) To accept the dental base relationship and carry out orthodontic treatment in the mixed or permanent dentition to be followed by surgery in the form of masking operations such as epithelial inlays or onlay bone grafts.

Some of the factors to be considered when making this decision are:

(a) Severity of the damage to the head of the condyle – severe injury will favour the first course.
 (b) The age of the patient at the time of injury. Low's (1952) serial growth data suggested that the greatest increment of mandibular growth occurs in the first year of life. Thus if injury occurs at birth or during the first year the interference in mandibular growth will be maximal and masking operations may be less effective. Rushton (1944) and Greer Walker (1957) emphasized that a further age factor is the vulnerability of the condyle to crush injuries which the latter author believes is pronounced up to the age of 6 years.

(c) The potential for facial growth of the patient. With our present inadequate serial data on facial

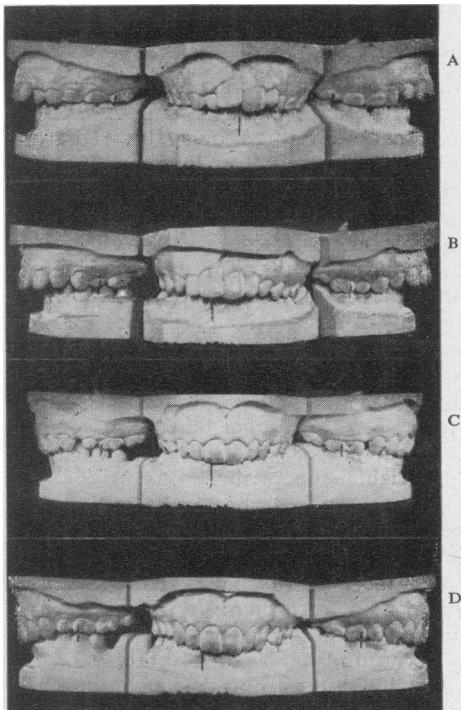


Fig 2 Study models at ages 8 years 8 months (A), 12 years 6 months (B), 15 years 4 months (C) and 22 years 7 months (D)

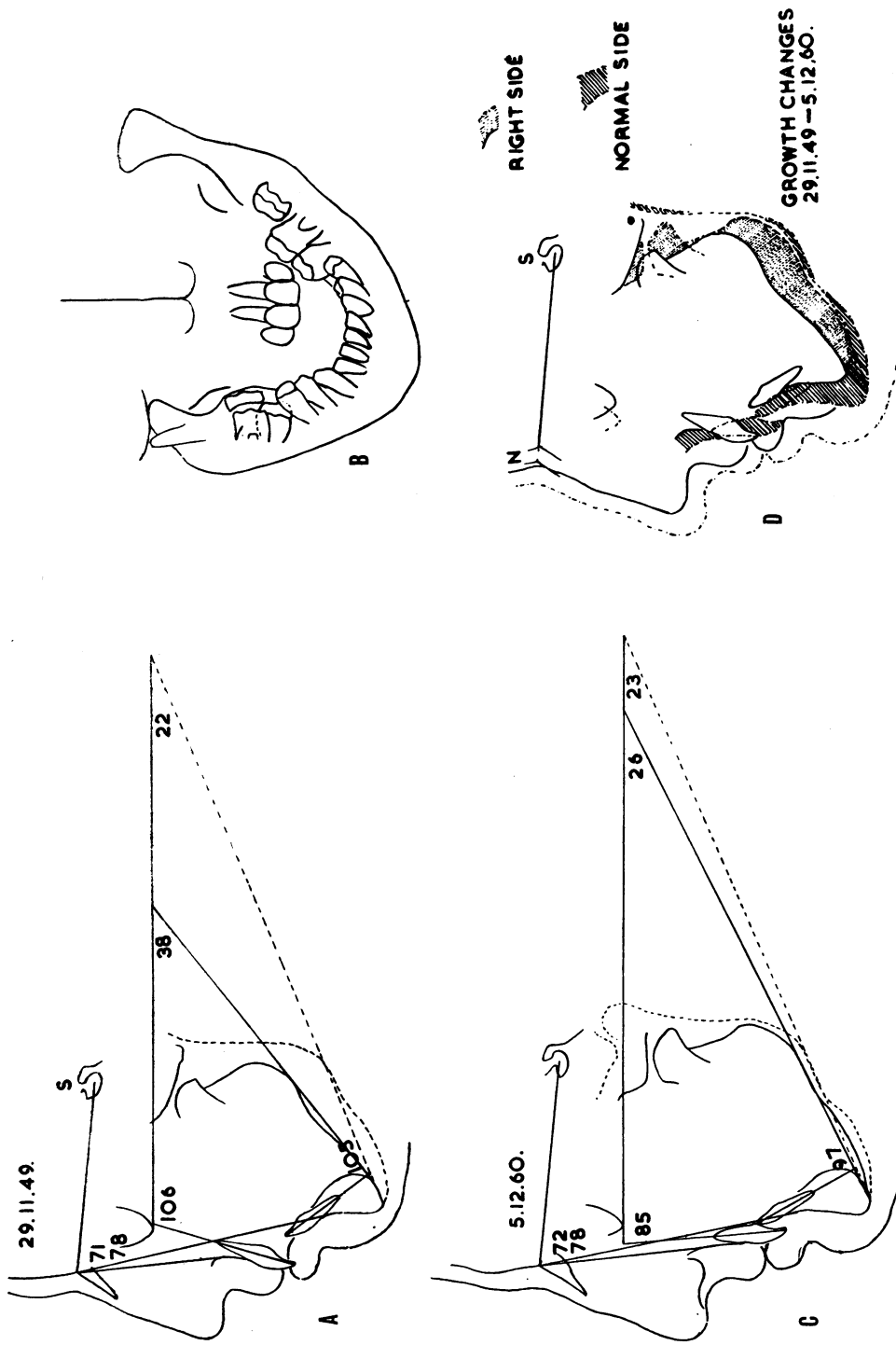


Fig 3 Tracing of radiographs. Lateral and postero-anterior skulls at 11 years 6 months (A & B), lateral skull at 22 years 7 months (C) and superimposed lateral skull tracings (D)

growth this cannot be estimated with any certainty although the birth weight (unless premature), the family background and general serial growth records may be of help. It is important that serial standardized facial photographs, with the camera at least five feet away from the face to reduce distortion, serial cephalometric lateral and postero-anterior skull radiographs and serial study models be recorded.

(d) The possible effects and limitations of orthodontic treatment with particular reference to the soft tissue posture and activity.

In this case it was possible to help the patient by careful assessment of serial records and on this basis it was decided to adopt the second course.

Acknowledgments: I am indebted to Professor R V Bradlaw and Professor G E M Hallett for the early records of this patient, to Professor F E Hopper for details of treatment and to Professor G L Howe for help in preparing this report. I am also grateful to the Photographic Department of the Newcastle upon Tyne Dental Hospital for the illustrations.

REFERENCES

- Charles S W (1925) *Brit. dent. J.* 50, 621
 Low A (1952) *Growth of Children*. Aberdeen
 Rushton M (1944) *Brit. dent. J.* 76, 57
 Sarnat B G & Engel M B (1951) *Plast. reconstr. Surg.* 7, 364
 Walker D G (1957) *Dent. Practit.* 7, 160

Multilocular Cyst of the Mandible in a Patient with Paget's Disease

by A J MacGregor BDS FDS RCS (*Leeds*)

Large tumours of the jaws are increasingly uncommon, and the one described has further interest in that it occurred in a mandible involved by Paget's disease.

Clinical findings: A 69-year-old widow presented with a painful swelling of the right side of her lower jaw. The pain, which had been present for one week, was relieved when a discharge occurred into her mouth. The swelling had been present for at least nine years, for it had been noted when her second set of dentures were made.

The swelling was most prominent in the region of the angle and ascending ramus, with slight prominence of the left molar region. A sinus was present in the lower right third molar region. On palpation the expansion was felt to be of bony consistency, extending from the molar region to the temporomandibular joint. Neither the sub-mandibular nor the cervical lymph nodes were palpable. There was normal sensation in the lips.

Radiographic examination: The expanded mandible contained a multilocular cyst with cavities of different sizes and there was a soap-bubble appearance in the right premolar region. The lesion involved almost all the right side and crossed the mid-line to the left canine area. A cotton-wool appearance of the calvarium was noted and intra-oral views of the maxilla showed a faint ground-glass appearance (Fig 1). A skeletal survey demonstrated that Paget's disease was confined to the skull.

The differential white cell count, serum calcium, phosphorus, and alkaline phosphatase were within the normal range. The Wassermann reaction was negative.

Biopsy: A wedge of tissue including some bone was removed from the cyst wall at the posterior margin of the opening. Histological examination showed the cavity lined with squamous epithelium. There was no evidence of adamantinoma. The bone, which was of the coarse woven variety, had internal reversal lines, and some of the islands had brush borders. The appearance was similar to that found in Paget's disease. Bone from the right maxillary third molar region showed the disease more clearly, internal markings were more numerous and there were abundant osteoclasts and some osteoblasts (Fig 2).

Treatment: The Paget's disease was asymptomatic and required no treatment. The cystic lesion presented diagnostic difficulties. Biopsy sup-

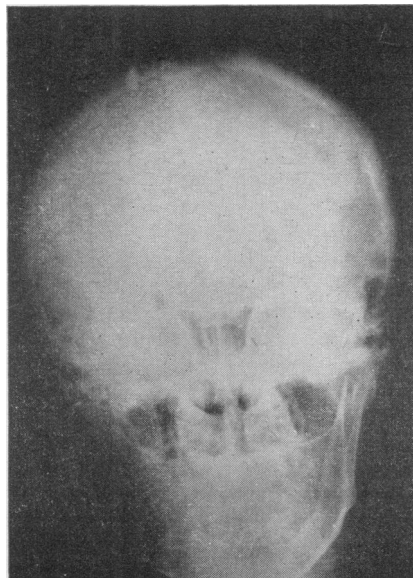


Fig 1 Radiograph showing pagetoid lesions of calvarium and multilocular cyst of right mandible