

## COXA VALGA CAUSED BY A SEPARATION OF THE EPIPHYSIS<sup>1)</sup>

BY

H. SCHEUERMANN,  
COPENHAGEN

The cause of some forms of Coxa valga has not hitherto been quite clear. While we know with certainty that Coxa vara may arise owing to Rachitis (Osteomalacia), the Calvé-Perthes disease, congenital dislocation of the hip, Chondrodystrophy, infectious diseases (Tb., Osteomyl.) Ostitis fibrosa, Arthritis deformans, Fract. colli femoris, and Epiphysis separation of the caput femoris (formerly called statica or Coxa vara adolescentium), the following have been supposed to be the causes of Coxa valga, viz. Congenital familial predisposition, Little's disease, after-effects of palsy, after-effects of traumata of the collum femoris and Coxa valga adolescentium (F. Lange).

Only a single author, *Walter Müller*, (Die Entstehung der coxa valga durch Epiphysenverschiebung. Beitr. z. klin. Chir., Bd. 37, p. 1, and Münch. med. Wochenschr. 1926, No. 9, p. 386), has pointed out that this deformity may also be due to a separation of the epiphysis of the caput femoris. This possibility is not even mentioned in *Hackenbrock's* large work (Ergebnisse der Chir. u. Orthop., 1927, Bd. 22. p. 71).

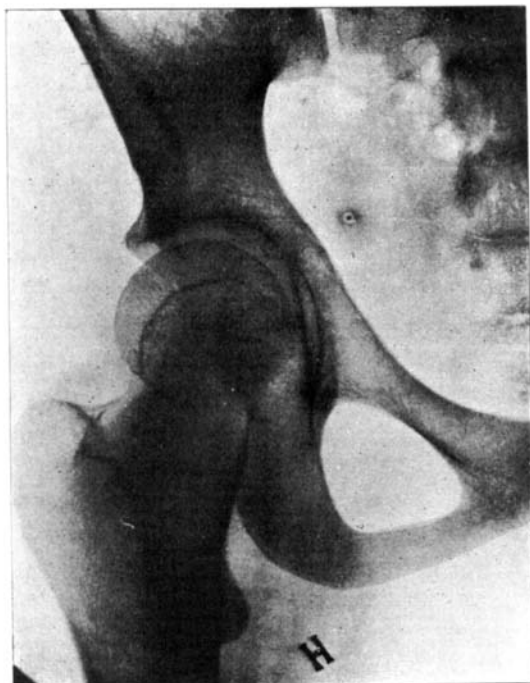
The two forms differ in that, in Coxa valga the caput femoris is displaced laterally instead of medially as usual. This is a natural consequence of the fact that the weight of the body in the standing position will force the caput inward, medianward and downward, as in the case of Fractura colli femoris.

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<sup>1)</sup> Communicated at a meeting of the Danish Radiological Society on 12/3 1930.

The deformity of the collum called Coxa vara manifests itself in a shortening of the collum and a diminution of the angle to c.  $90^{\circ}$  or even less, as opposed to Coxa valga, in which the collum is lengthened, and the angle of the collum increased (up to c.  $140^{\circ}$ ).

When a separation of the epiphysis of the caput femoris



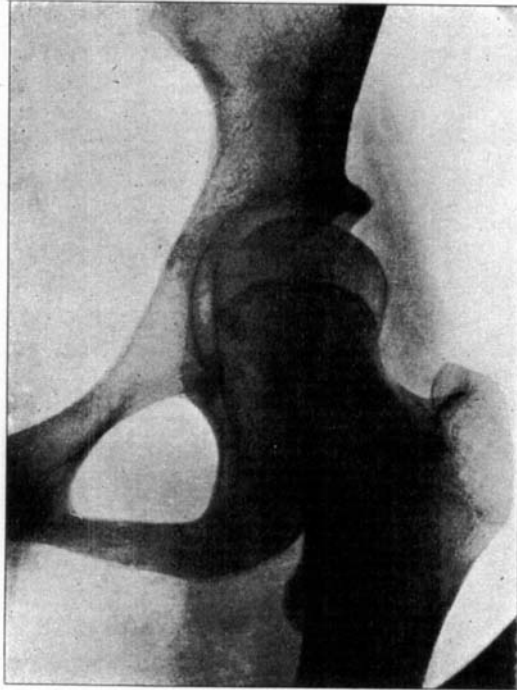
Right side.

takes place, the caput is displaced, and is then healed in the new abnormal position, by which the deformities referred to above are successively developed.

As already stated, the most frequent deformity arising in connection with a separation of the epiphysis is Coxa vara, because the caput can more easily glide medianwards than to the lateral side, but in rarer cases it may glide to the lateral side, and this gives rise to the Coxa valga deformity. There can be no doubt whatever, that this happens more frequently

than is generally supposed, especially when it is kept in mind that the acute stage can very easily be misunderstood.

Many of the so-called congenital forms of Coxa valga, and the forms supposed to have arisen after a trauma with infraction of the collum, besides Coxa valga adolescentium, or idiopathica are in *my* opinion the consequence of a misunderstood



*Left side.*

separation of the epiphysis with lateral displacement. That this fact has not previously been clearly understood is a consequence of the relatively rare occurrence, the difficulty of diagnosing the incipient stage, and a deficient Röntgentechnique. Many of the published cases of Coxa valga, on a closer inspection of the skiagram, prove to be merely a picture of the collum in rotation outwards. The Röntgen examination must always be made during the inward rotation.

We know that, in the period of growth, at the age of 14—16,

the growth-lines are apt to yield after traumata, but the trauma need not always be very considerable. Separation of the epiphysis may arise even from so slight a cause that it has hardly the nature of a trauma. The case quoted below affords an example.

Girl of 14, sent for Röntgen examination on 31/10 1929. Three weeks previously she had suddenly, while walking, felt that she broke down in the right hip. She did not fall but felt a rather severe pain. She was, however, out of bed for a couple of days though in some pain, and then saw a doctor who advised confinement to bed and the application of poultices for a fortnight. She has now been up for a couple of days and occasionally feels a grating in the right hip-joint which can be heard, too, when she walks. — She is very tall, overgrown, thin, but seems to be in good health, has had no chronic diseases. She walks naturally but somewhat cautiously, states of her own accord that her right leg feels to her a little longer than the left. Occasionally, when she is walking, some creaking is heard during the movements of the hip-joint. She can stand on the right leg alone, Trendelenburg's symptom is not present. The movements in the right hip-joint are restricted.

*The skiagram* of the right hip-joint shows that the caput femoris has been laterally displaced about 3 mm, a notch in the contour between the head and the neck being visible at the medial edge of the epiphyseal line.

The epiphyseal line is not so sharp on the affected side as on the sound one. The caput conveys the impression of being a little narrower, having probably glided a little backward. Interarticular space unaltered. Examination in some abduction (strong abduction was not possible) gave no further information. Position of the collum femoris somewhat steep. Confinement to bed was prescribed. Patient was strictly enjoined not to leave her bed at all. She did not get up again till 30/12 1929, that is, two months after having gone to bed. Patient now walks well without any pain and without grating. There is restricted mobility in the right hip-joint. She can flex actively and passively to  $45^{\circ}$  and abduce to  $45^{\circ}$ . There is atrophy of 2 cm of the

right femur, no Trendelenburg symptom. *The skiagram* showed quite the same facts as two months before, only the epiphyseal line is perhaps a little more sharply marked. Position of the caput femoris unaltered. —

A case like the present, in which the separation, displacement, and healing up in the new position of the caput was closely observed, will not often occur. It is, indeed, a rare case, which, however, furnishes the proof hitherto wanting in the etiology of Coxa valga, viz. that this deformity may arise in connection with a separation of the epiphysis.

What especially impresses one in this case is the way in which it arose, during quite ordinary walking; hence it is reasonable to suppose that such cases are more frequent than one would think. The slight cause of the great effect, by which the patient is slightly incapacitated for the rest of her life, with restricted mobility and reduced strength of the right leg, will be very little noticed by her surroundings, who will as a rule put it down to »growing pains«.

Another singularity of this case is, that at the first examination a *grating* could be heard and felt in the right hip-joint when the patient walked.

This may possibly have been caused by the caput rotating against the epiphyseal plane of the collum, and can be explained when we remember that the latter is furnished with a crown of partly radially placed small undulating projections fitting into corresponding hollows on the under side of the caput. It is, however, more reasonable to suppose (as was pointed out during the discussion by *P. G. K. Bentzon*) that it was caused by the free medial edge of the collum grating against the acetabulum. As a matter of fact, it was this grating which was the chief reason, why the patient was sent for x-ray examination.

When the displacement is as inconsiderable as in this case, it should be attempted to make the caput grow together by confinement to bed for some length of time: if the displacement is more considerable it may be necessary to try reduction.

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