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EPIPHYSEODESIS OF THE GREATER TROCHANTER

By

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In 1957 one of the present writers (*A. Langenskiöld*) introduced epiphyseodesis of the greater trochanter as a method of treatment for cases of moderate infantile coxa vara. The idea of using epiphyseodesis of the greater trochanter as a measure of treatment arose from the observation of growth disturbances of the upper end of the femur encountered in the treatment of congenital dislocation of the hip (CDH).

Figure 1 A shows the hip of a child after closed reduction of congenital dislocation. The shape of the upper end of the femur appears normal in the radiograph. Ten years after reduction a radiograph of the same hip (Figure 1 B) showed that the growth from the epiphyseal plate of the femoral head had been disturbed and there was considerable hypertrophy of the greater trochanter. The Trendelenburg test was negative. Epiphyseodesis of the greater trochanter was planned but was not carried out. Three years later (Figure 1 C), the hypertrophy of the greater trochanter was still more pronounced. The Trendelenburg test was positive and a considerable limp had developed.

Figure 2 shows a hip in which extreme hypertrophy of the greater trochanter caused by growth disturbance of the capital epiphyseal plate had developed after open reduction of CDH.

Figure 3 A shows an unsatisfactory position of the left hip after closed reduction of CDH. The shape of the upper end of the femur appears normal. At open reduction of this hip the epiphyseal plate of the greater trochanter was damaged and extreme coxa valga developed (Figures 3 B and C).

Figure 4 shows a case of CDH in which open reduction of the right hip led to growth disturbance of the capital epiphyseal plate and coxa vara, whereas the open reduction of the left hip resulted in a growth disturbance of the epiphyseal plate of the greater trochanter and coxa valga.

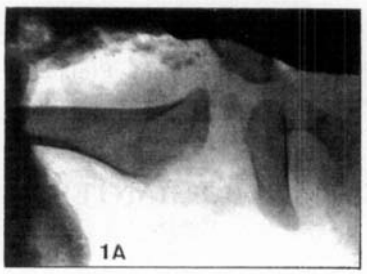
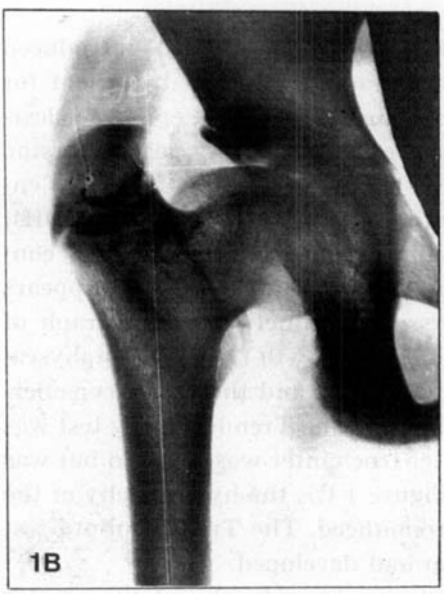
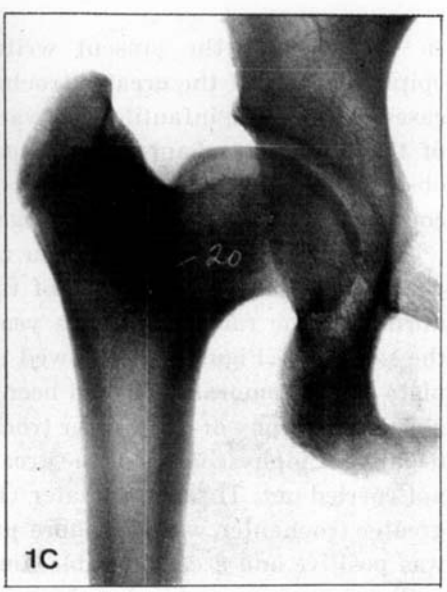


Figure 1. Congenital dislocation of the right hip in a girl. A. The hip after closed reduction on June 11, 1949 at the age of one year. Normal shape of the upper end of the femur. B. Radiograph of the hip at the age of ten and a half years. Overgrowth of the greater trochanter. Shortening of the neck and flattening of the head of the femur. C. Age fourteen years. Considerable hypertrophy of the trochanter. Disabling limp. Two and a half centimeters shortening of the limb.





In Calvé–Legg–Perthes disease (coxa plana) a disturbance of epiphyseal growth in the head of the femur may lead to considerable overgrowth of the greater trochanter, accompanied by insufficiency of the abductors of the hip and a marked limp. An example of such a course in coxa plana is seen in Figure 5.

The experience gained from a number of cases similar to those illustrated in Figures 1–4 showed that a severe disturbance in the growth of the capital epiphyseal plate of the femur led to gradual overgrowth of the greater trochanter, ultimately resulting in a limping gait. On the oher hand, a disturbance in the growth of the greater trochanter generally caused no disturbance in the function and no reduction of

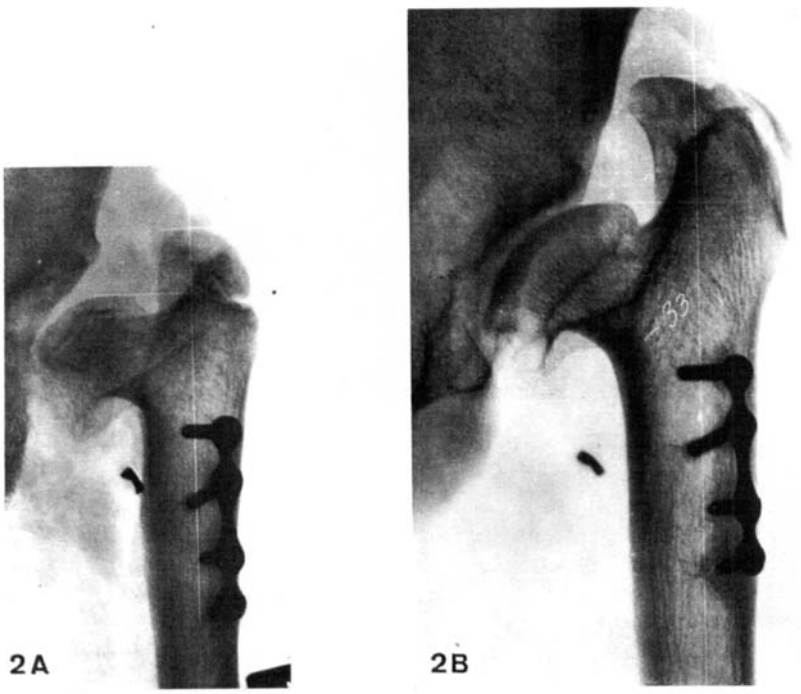
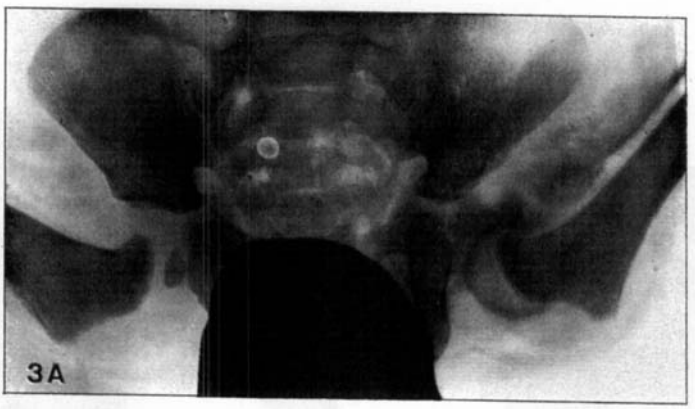


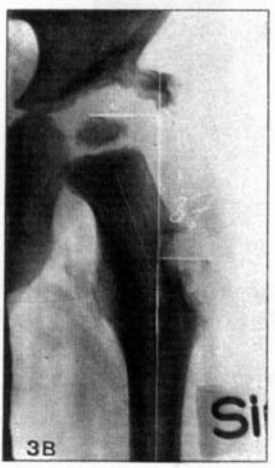
Figure 2. Congenital dislocation of the left hip in a girl treated by open reduction at the age of two years. A. Age seven years. Short neck. Flattened head. Overgrowth of the greater trochanter. Trendelenburg sign negative. B. Age fifteen years. Extreme hypertrophy of the greater trochanter. Trendelenburg sign positive.

the length of the limb. A consequence of this experience was the idea that the disturbance of abductor function which threatens when growth is disturbed in the capital epiphyseal plate, could be prevented by epiphyseodesis of the greater trochanter.

The fact that a disturbance of growth in the epiphyseal plate of the greater trochanter results in coxa valga, whereas a disturbance in the growth of the capital epiphyseal plate of the femur leads to coxa vara, was first pointed out by *Compere, Garrison & Fahey* in 1940. However, the possibility of using epiphyseodesis of the greater trochanter as a therapeutic measure seems not to have been recognized before work on this problem was started in the Orthopaedic Hospital of the Invalid Foundation in 1957.

In 1959 *Laurent* confirmed the findings of *Compere et al.*, using rabbits for his experiments. Destruction of the epiphyseal plate of the





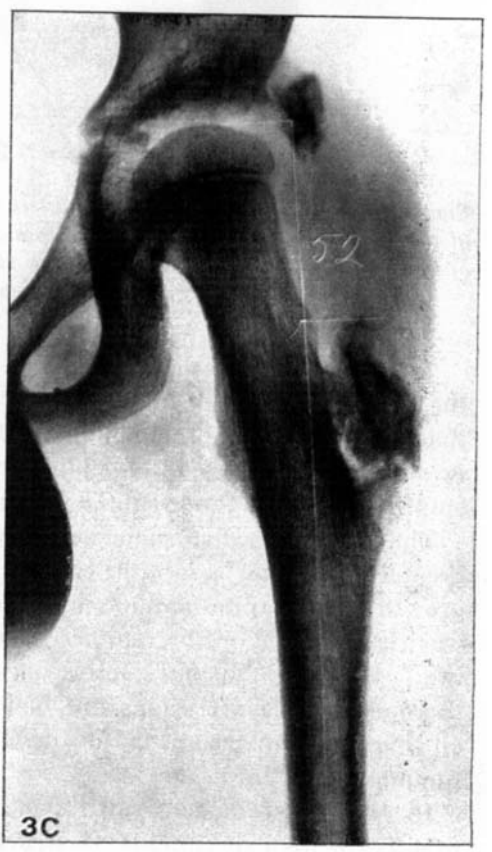
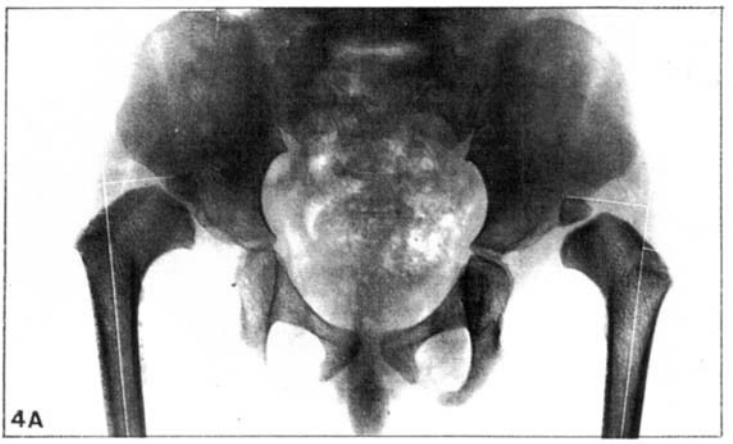


Figure 3. Congenital dislocation of the left hip in a boy. A. Arthrography showing unsatisfactory position of the left hip after closed reduction. Normal shape of the upper end of the femur. Age one-and-a-half years. B. Age three years. Coxa valga one-and-a-half years after open reduction. Valgus position caused by damage to the epiphyseal cartilage of the greater trochanter. C. Extreme coxa valga at the age of thirteen years. The left lower limb two centimeters longer than the right. Normal function of the left hip.



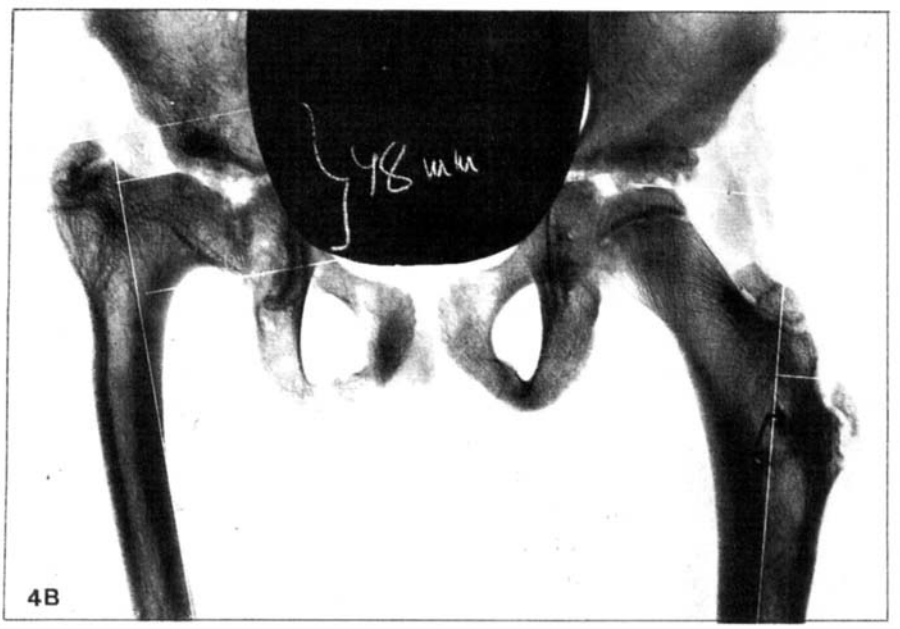


Figure 4. Bilateral congenital dislocation of the hip in a girl. A. The hips at the age of two and a half years before open reduction. B. Age eight years. In the right hip, open reduction was followed by growth disturbance of the capital epiphyseal plate resulting in coxa vara. In the left hip, damage to the epiphyseal plate of the greater trochanter caused marked coxa valga. Trendelenburg sign positive on the right side and negative on the left.

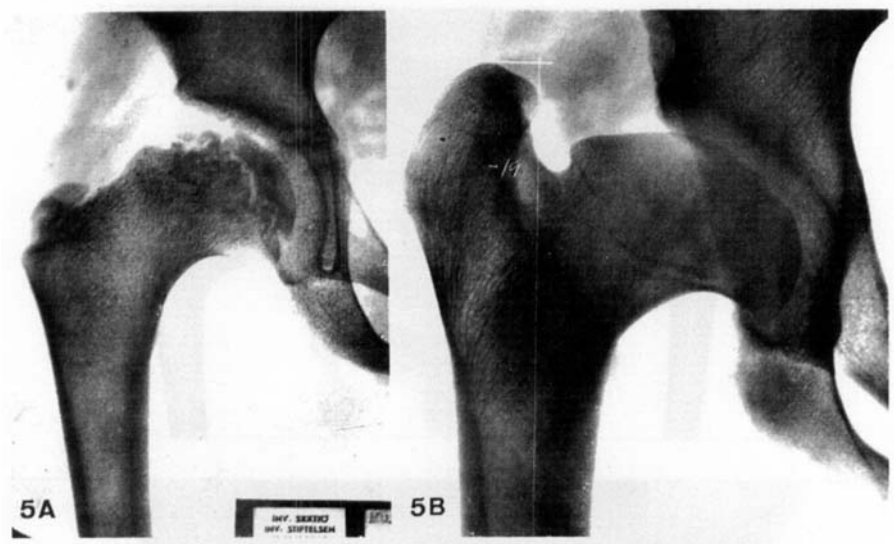


Figure 5. Coxa plana in a boy. A. Age nine years. Growth disturbance of the head and neck of the femur. B. Age seventeen years. Shortening of the neck and flattening of the head of the femur. Hypertrophy of the greater trochanter had developed after the age of fourteen. At this age the capital epiphyseal plate closed, the greater trochanter continuing to grow.

greater trochaner in the rabbits produced a coxa valga deformity very similar to that seen in Figures 3 and 4 in this article.

In 1960, in his thesis on coxa vara infantum, *Pylkkänen* reported the first three cases in which epiphyseodesis of the greater trochanter was carried out for a moderate form of this disorder.

Although epiphyseodesis of the greater trochanter was introduced as a treatment for moderate infantile coxa vara, it was soon found that there was a large group of cases of coxa plana and of treated cases of CDH in which the operation seemed to be indicated as a prophylactic measure to prevent increasing limp from gradual overgrowth of the greater trochanter.

In 1957, the principle of using traction treatment before closed or open reduction on every child with CDH except the newborn was introduced in the Orthopaedic Hospital of the Invalid Foundation (*Langenskiöld & Laurent*). Growth disturbance of the capital epiphysis has seldom been seen in patients with CDH treated in this hospital since the year mentioned. However, the patients treated in an earlier period having severe growth disturbances in their hips (Figures 1–4), had to

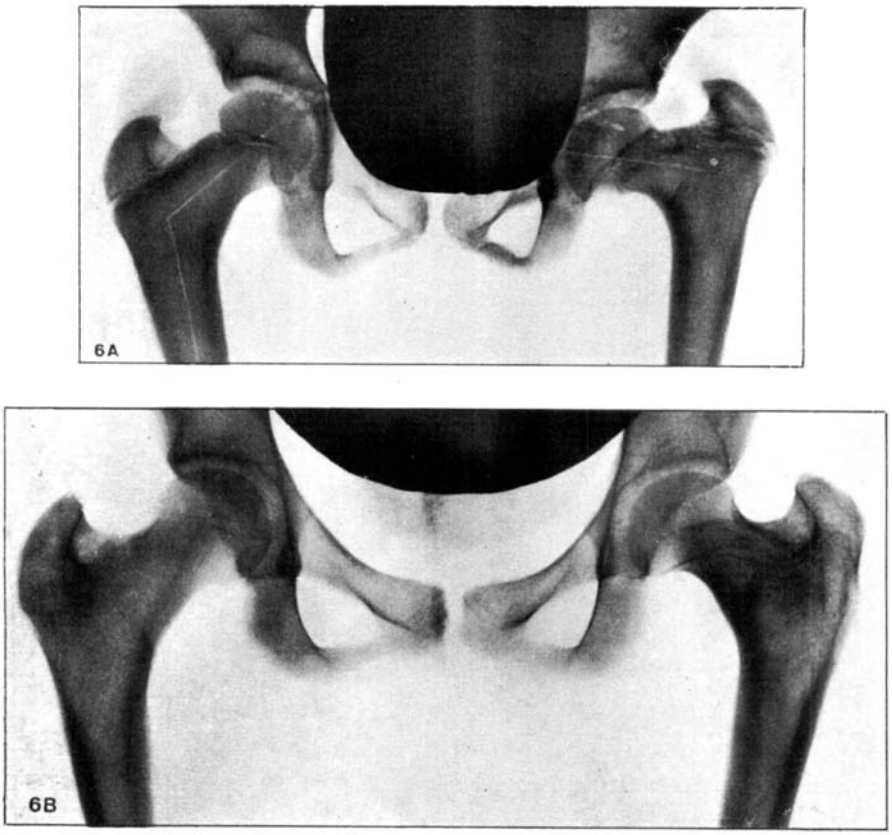


Figure 6. Infantile coxa vara of the left hip in a girl. A. Age nine and a half years. Kept under observation from the age of seven. Trendelenburg sign positive on the left side. B. Age fifteen years. Epiphyseodesis of the left greater trochanter had been performed at the age of ten years and five months. Trendelenburg sign negative. The left lower limb was one centimeter shorter than the right. Function of the left hip normal.

be dealt with during the entire period of growth. In addition, cases of CDH treated without traction before reduction in other hospitals were often sent for further treatment to the Orthopaedic Hospital of the Invalid Foundation. This is the background to the large number of cases of CDH in which epiphyseodesis of the greater trochanter has been carried out and which are reported below.

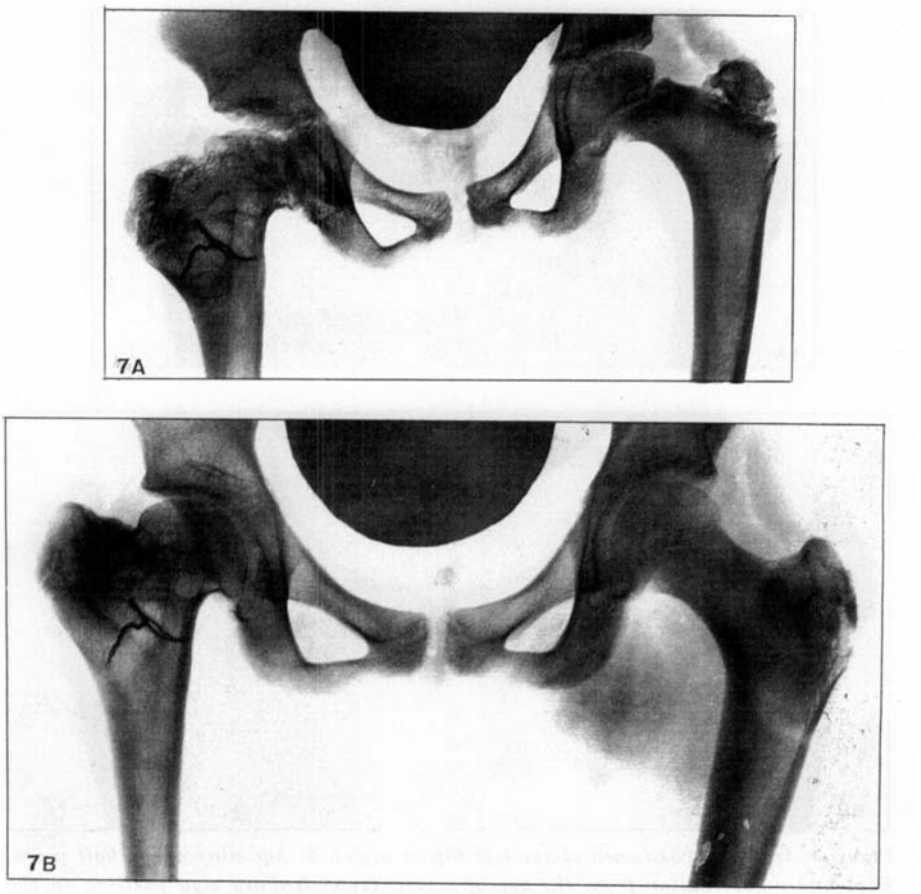
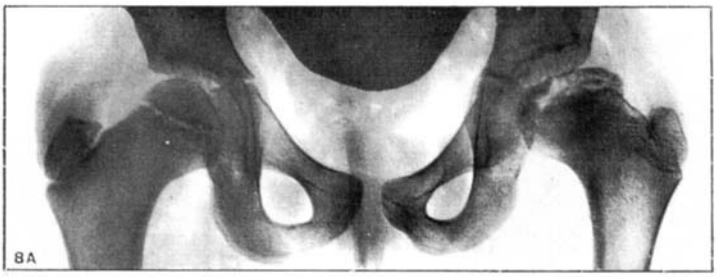


Figure 7. Bilateral infantile coxa vara. A. On the right side, osteotomy of the femur had been performed for severe coxa vara. On the left side, epiphyseodesis of the greater trochanter had been carried out two years before the radiograph was taken. Age twelve years and ten months. B. Age sixteen years. On the right side, slight recurrence of coxa vara as a result of overgrowth of the greater trochanter. On the left side, normal shape of the upper end of the femur after epiphyseodesis of the greater trochanter had been performed at the age of ten years.

Figure 8. Coxa plana on the left side in a girl. A. Age seven years and eight months. Growth disturbance of the left femoral head and neck. B. Age eleven years. Short neck and flattened head of the femur. Hypertrophy of the greater trochanter threatening. C. Age eleven and a half years. Radiograph taken four months after epiphyseodesis of the greater trochanter. D. Age twelve years and eight months. Normal function of the left hip. Compare with Figure 5.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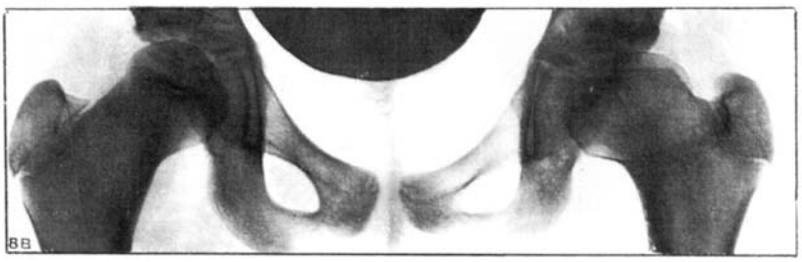
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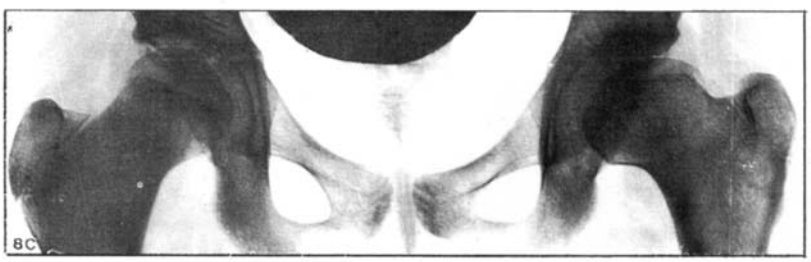
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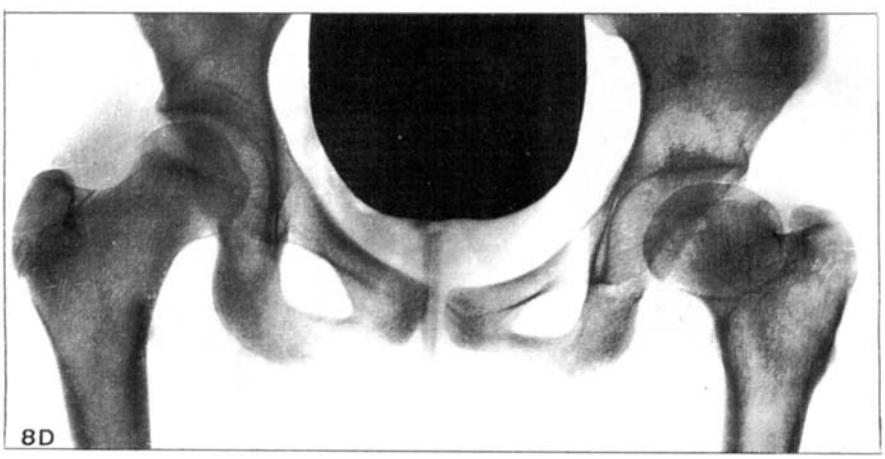
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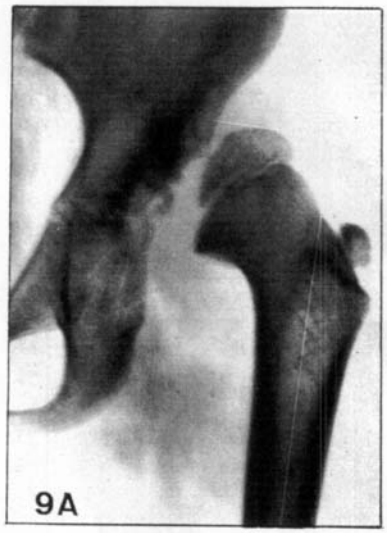

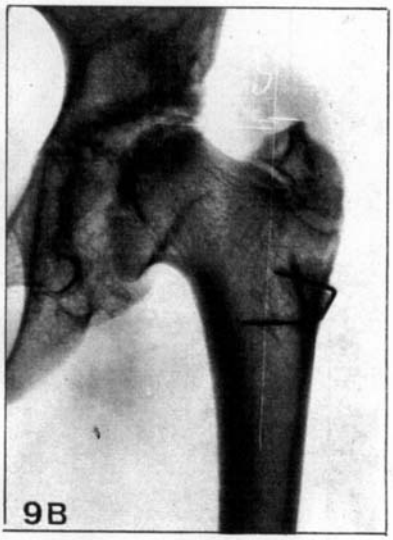

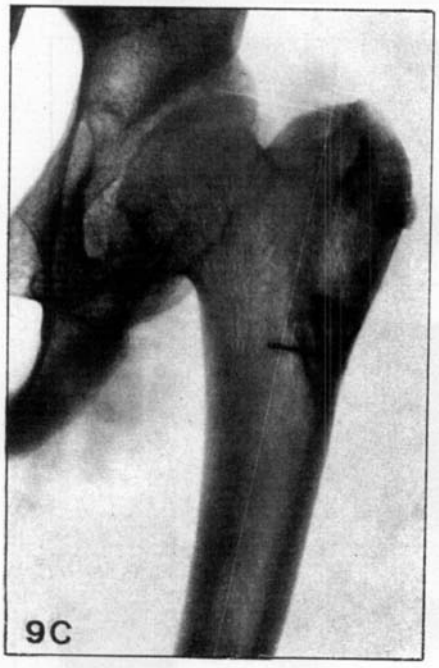

Figure 9. Congenital dislocation of the left hip in a girl. A. Age six years and eight months. Radiograph taken before capsular arthroplasty a. m. Colonna. B. Age ten years. Growth disturbance of the femoral head and neck. Overgrowth of the greater trochanter threatening. C. Age fifteen years. Epiphyseodesis of the greater trochanter performed at the age of eleven years and nine months. Shortening of the limb by two centimeters. Slight limp. Cf. Figure 2.

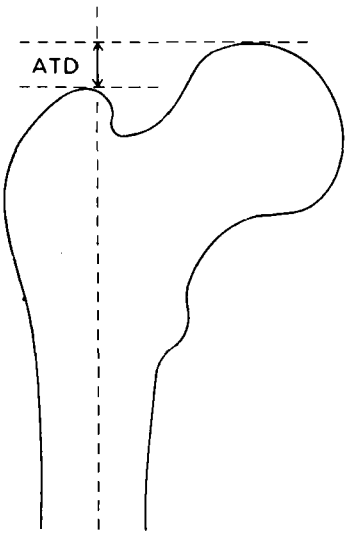

Figure 10. Determination of the articulo-trochanteric distance (ATD). Edgren 1965. See the text given below.

THE ARTICULO-TROCHANTERIC DISTANCE (ATD)

In a monograph on coxa plana published in 1960, *Edgren* reported twenty-five cases in which epiphyseodesis of the greater trochanter had been carried out for this disorder.

For the estimation of the degree of abnormal position of the greater trochanter in relation to the head of the femur there was a need for a method of measurement. For this purpose *Edgren* defined the concept of the articulo-trochanteric distance (ATD). The manner of determination of the ATD from a radiograph is seen in Figure 10. The ATD is the difference in the level on the longitudinal axis of the femur of the tip of the bony part of the greater trochanter and the top of the head of the femur. When the top of the head of the femur is on a more cranial level than the tip of the greater trochanter, the ATD is considered positive, and when the tip of the trochanter lies more cranial the ATD is considered negative.

In order to ascertain the extent to which ATD is influenced by different rotational positions of the femur, *Edgren* carried out radiological investigations on normal individuals and on a specimen. With the standard technique of taking radiographs of hips in the hospital, the error of measuring the ATD from radiographs is considered to be within ten per cent (*Edgren*, personal communication).

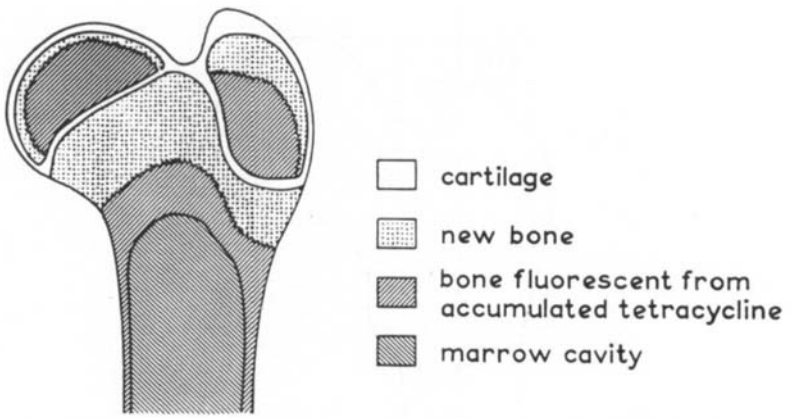

Figure 11. Drawing of a frontal section through the upper end of the femur of a fourteen-week-old pig, injected eight weeks previously with tetracycline (Salenius)

In man, the ATD of a normal hip is always positive in all age groups. In the series of cases of coxa plana reported by *Edgren* it could be clearly shown that premature closure of the epiphyseal plate of the femoral head was associated with a marked reduction of the ATD, which signified an overgrowth of the greater trochanter. *Edgren* was also able to state that abductor insufficiency in coxa plana may develop at a very advanced stage of the disease as a result of elevation of the greater trochanter.

From he dense lines often appearing in the metaphysis of the upper end of the femur in children it appears that the growth in length of the capital metaphysis is almost twice the growth of the trochanteric metaphysis. Using tetracycline labelling in experiments with pigs, *Salenius* showed that the difference in growth in length of the capital and the trochanteric metaphyses is associated with a reverse difference in growth of the head from the articular cartilage and that of the greater trochanter from he cartilage covering its cranial surface (Figure 11). As a consequence of this, it can be stated that about one half of the growth in length of the greater trochanter can be arrested by epiphyseodesis.

MATERIAL

From November 1957 to the end of 1965, epiphyseodesis of the greater trochanter was performed in 109 cases on 117 hips. In thirty of these cases, the indication for this procedure was moderate infantile coxa vara, and threatening overgrowth of the greater trochanter in coxa plana in thirty-two cases. In forty-seven cases,

the indication was disturbance in the growth of the capital epiphyseal plate after closed or open reduction of congenital dislocation of the hip (CDH).

The estimation of the beneficial effect of epiphyseodesis of the greater trochanter in preventing insufficiency of the abductors of the hip in the individual case, is made difficult by several factors. The degree and the course of the growth disturbance of the capital epiphysial plate which is decisive for the degree of threatening overgrowth of the trochanter, cannot be estimated by radiography with any certainty. Owing to the manner of growth of the trochanter, a disadvantageous course of reduction of the ATD in a case with a severe disturbance of growth in the capital epiphyseal plate is reduced but not completely stopped by the epiphyseodesis. Proof of the effect of the operation in a group of cases can thus be established by proving a definite change in the course of the reduction of the ATD after the operation.

Only the group of cases of CDH in which epiphyseodesis of the greater trochanter was performed was found to be both large and uniform enough to permit statistical evaluation of the degree of the effect of the operation.

Data concerning the cases of infantile coxa vara in which epiphyseodesis of the greater trochanter was performed are given in Table 1. Figures 6 and 7 show radiographs of two of these cases. The disturbance in the growth of the head and neck of the femur varies very much in cases of moderate infantile coxa vara. This makes the estimation of the effect achieved by epiphyseodesis of the trochanter unreliable. However, when progression of varus threatens the operation is indicated in this group of cases as an alternative to osteotomy.

Data concerning the cases of coxa plana in which the operation had been carried out are shown in Table 1. Figure 8 shows radiographs of one of these cases. Serial radiographs of this case had shown gradual reduction of the ATD in the affected left hip before epiphyseodesis of the greater trochanter was carried out at the age of eleven years. At the age of twelve years the ATD was still + 4 millimeters. The development of a condition similar to that seen in Figure 5 B was prevented by the operation.

EPIPHYSEODESIS OF THE GREATER TROCHANTER INDICATED BY GROWTH DISTURBANCE IN THE CAPITAL EPIPHYSEAL PLATE AFTER TREATMENT FOR CDH

Some general data concerning the cases of CDH in which epiphyseodesis of the greater trochanter was carried out are given Table 1. In this group an attempt was made to evaluate statistically some of the data connected with the degree of overgrowth of the trochanter and the effect of the operation.

It is known that the capital epiphyseal plate contributes about 30 per cent of the growth in length of the femur. Although operations carried out for reduction of CDH particularly derotation osteotomy of the femur, stimulate growth in the distal end of the femur, discrepancy of leg length in unilateral cases of CDH can be expected to depend on the

degree of growth disturbance in the capital epiphyseal plate. In the group of unilateral cases, it could be shown that the degree of overgrowth of the greater trochanter on the affected side roughly corresponded to the degree of discrepancy of leg length (Table 2).

Table 1. Age and sex distribution of the cases in which epiphyseodesis of the greater trochanter was carried out.

	Total number	Girls	Boys	Op. before 5 years of age	Op. at 5–6 years	Op. at 6–7 years	Op. at 7–8 years	Op. at 8–9 years	Op. at 9–10 years	Op. at 10–11 years	Op. at 11–12 years	Op. at 12–13 years	Op. at 13–16 years
CDH	47	36	11	2	2	5	3	9	7	5	8	3	3
Coxa plana	32	6	26	–	–	–	1	–	3	5	6	5	12
Infantile coxa vara	30	14	16	–	–	1	2	3	6	6	1	3	8
Bilaterally operated	8	5	3	–	–	1	–	–	1	2	1	1	2
Reoperated (Age at first operation tabulated)	12	8	4	2	1	–	–	1	3	1	3	–	1

Table 2. The correlation between the articulo-trochanteric distance (ATD) and leg length differences of sound and affected sides in unilateral CDH.

ATD-difference mm	Number of observations	Mean of the leg length difference in mm
5– 6	9	7
7– 8	4	8
9–10	8	9
11–12	14	9
13–14	11	13
15–16	11	15
17–18	11	11
19–20	7	14
21–22	11	16
23–24	5	22
25–26	7	18

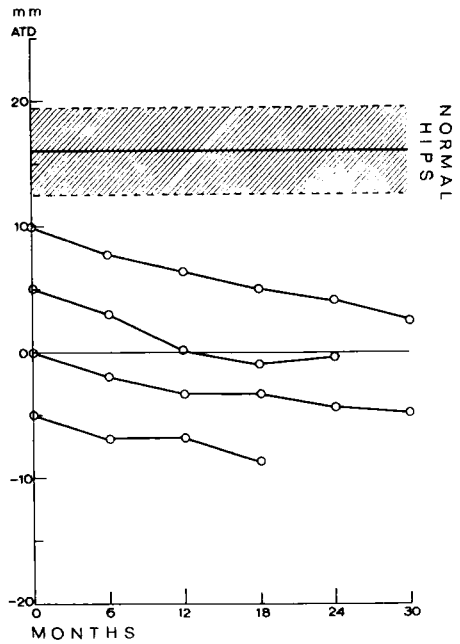

Figure 12. At the top of the figure the mean of the ATD of a healthy hip during the observation period has been indicated. This value has been given as 16 mm. Above and below it are given the values according to standard deviation, calculated as 3.5 mm. It was observed that the mean ATD in girls between the ages of 5–13 years was 16 mm±3.6 mm within the 95 per cent probability limits of 9–23 mm. The corresponding values of ATD in boys were 23±4.5 mm with 95 per cent probability limits of 14–32 mm. This difference was statistically highly significant ($P < 0.01$), in spite of the fact that the number of boys was very small. The curves in the lower half of the figure indicate the development of ATD in affected hips in CDH before operation during the observation period of 18–30 months. The curves have been given according to the first value of ATD recorded in a particular case, i.e. for those with the first recorded value of ATD of +10 mm, +5 mm, 0 mm and —5 mm. The curves represent the means of observations in each group.

The harmful effect of overgrowth of the greater trochanter manifests itself in a positive Trendelenburg sign caused by insufficiency of the muscles responsible for abduction of the hip. The relationship of a positive Trendelenburg sign to the length of the ATD is tabulated in Table 3 on the basis of 201 observations. It appeared that the Trendelenburg sign was positive in more than half of the cases when the ATD was reduced to less than —5 millimeters.

The upper half of figure 12 shows the ATD and variations in the

normal hips of the patients with unilateral CDH. The age distribution of the cases in this group was from four years and eleven months to fourteen years. The fact that the ATD of normal hips measured from radiographs remains fairly constant irrespective of age depends partly on the gradual ossification of the cartilaginous part of the tip of the trochanter.

Table 3. Correlation between ATD on the affected side and the percentage of positive Trendelenburg sign observations in cases of unilateral CDH in girls.

ATD, mm	Number of observations	Trendelenburg + per cent
14 – 16	22	27
11 – 13	27	41
8 – 10	26	35
5 – 7	26	19
2 – 4	22	25
— 1 – + 1	17	26
— 4 – — 2	16	34
— 7 – — 5	14	57
—10 – — 8	12	62
—13 – —11	11	86
—16 – —14	8	100

As it was observed that the ATD was somewhat higher in boys than in girls, the correlation was estimated differently in both groups. However, the number of boys was so small that no statistical evaluation of observations was possible. The table shows clearly how most of the observations of Trendelenburg sign become positive when the value of ATD falls below —5 mm, *i.e.* when the greater trochanter grows 5 mm over the level of the upper limit of the femoral head.

The ATD of the pathological hips in this series have been divided into four groups represented by the four descending curves in Figure 12. The curves show the gradual reduction of the ATD in thirty-six reduced hips with a disturbance in the growth of the capital epi-

Table 4.

The change in development after operation is expressed in differences between the preoperative value and the value at operation on one side and the value at operation minus the value 24 months after operation. If the former was greater, the change in development has been given as positive and in other cases negative. It was observed that the change was positive in 22 cases and negative in 7 cases. This difference is statistically highly significant ($P<0.01$) and indicates the positive result of the operation. Cf. Figure 13.

Table 4. The development of ATD on the affected side in 29 cases of CDH 24 months before and after epiphyseodesis of the greater trochanter. (Values interpolated from two consecutive observations.)

24 months before operation	At operation	24 months after operation	Preoperative value minus value at operation	Value at operation minus postoperative value	Development
18.0	7.0	6.0	—11.0	— 1.0	+
15.4	9.0	11,2	— 6.4	+ 2.2	+
14.0	3.0	— 5.0	—11.0	— 8.0	+
11.0	2.0	— 0.8	— 9.0	— 1.2	+
7.8	2.0	+ 1.2	— 5.8	— 0.8	+
7.0	2.0	1.4	— 5.0	— 0.6	+
— 2.5	— 0.6	— 2.6	+ 2.2	— 2.0	—
6.0	3.0	6.3	— 3.0	+ 3.3	+
5.2	2.0	0	— 3.2	— 2.0	+
11.0	— 3.0	1.2	—14.0	+ 4.2	+
4.0	— 1.0	— 5.0	— 5.0	— 4.0	+
3.3	— 3.0	— 2.4	— 6.3	+ 0.6	+
1.4	— 2.0	— 2.2	— 3.4	+ 0.2	+
0.8	— 4.5	—13.0	— 5.3	— 8.5	—
— 0.5	— 2.4	— 9.6	— 1.9	— 7.2	—
— 0.9	— 3.0	— 4.0	— 2.1	— 1.0	+
— 1.5	— 3.0	— 1.4	— 1.5	+ 1.6	+
— 1.6	— 4.0	— 5.4	— 2.4	— 1.4	+
— 1.8	— 3.0	— 4.0	— 1.2	— 1.0	+
11.0	— 6.0	— 7.0	—17.0	— 1.0	+
5.0	— 5.0	— 7.0	—10.0	— 2.0	+
4.0	— 7.0	—15.0	—11.0	— 8.0	+
— 2.5	— 9.0	—12.0	— 6.5	— 3.0	+
3.0	—10.0	—11.0	—13.0	— 1.0	+
— 2.6	— 7.0	—13.8	— 4.4	— 6.8	—
— 6.1	—12.5	—14.4	— 6.4	— 1.9	+
— 7.8	—14.0	—22.2	— 6.2	— 8.2	—
—15.1	—22.0	—29.0	— 6.9	— 7.0	—
— 3.4	—11.0	—24.0	— 7.6	—13.0	—
	(—0.6, +9.0)		N		
R_1 7.8	2.0	1.2	9		
	(—4.5, —1.0)				
R_2 0.2	3.0	— 4.5	10		
	(22.0, —5.0)				
R_3 —2.5	—9.5	—12.9	10		

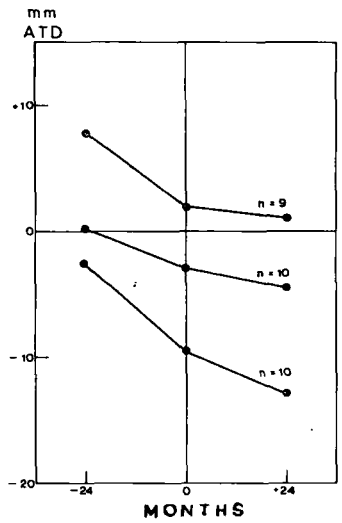

Figure 13. The recorded values of ATD 24 months before and after operation and at operation which are given in Table 6 have been divided into three groups according to the value at operation. Thus the 9 cases with highest values at operation are given as the first group, the following 10 as the second and the last 10 as the third. The curves represent the means of these values and thus indicate the development of ATD in each group before operation and the change in development after operation during the observation period of 24 months before and after operation. This change was given as plus or minus in Table 6. In the graphical presentation it appears as clearly positive in all groups.

physeal plate. The curves represent the periods during which the patients were followed before epiphyseodesis of the greater trochanter was carried out. A reduction of the ATD by 4–6 millimeters in two years seems to be a common course in such cases. From the curves seen in Figure 13 it appears that the course of development of the ATD over a two-year period before epiphyseodesis of the trochanter, was a reduction of it by 3–7 millimeters in two years. The course of development after the operation was a reduction of 1–4 millimeters in two years. The effect of the operation in reducing the overgrowth of the greater trochanter is also apparent from Table 4.

Figure 9 shows an example of the effect of epiphyseodesis of the greater trochanter in a case in which the growth of the head and neck of the femur were disturbed after a Colonna operation. Without reduction of the growth of the trochanter by epiphyseodesis, the ultimate result in this case would have been similar to that seen in Figure 2 b.

TECHNIQUE OF OPERATION

The greater trochanter is exposed by a lateral longitudinal incision through the tractus iliotibialis. The periosteum or the cartilage on the lateral aspect of the greater trochanter and the uppermost part of the vastus lateralis muscle are incised longitudinally to the bone proximal and distal to the epiphyseal plate of the trochanter. The edges of the periosteum and the cartilage are freed from the bone of the epiphysis and the metaphysis and from the cartilaginous plate by sharp dissection to ensure a complete covering of denuded bone by these tissues at closure of the wound.

A piece of bone with a piece of the cartilaginous plate in the middle is chiselled out a. m. Phemister. Anterior and posterior to this piece, the peripheral part of the plate is exciced along a distance of about half a centimeter. The epiphyseal plate of the trochanter with adjacent epiphyseal and metaphyseal bone is removed with a sharp spoon, leaving only the peripheral parts connecting the metaphyseal cortex to the epiphysis. To allow destruction of the plate under direct vision, the bone and the cartilage should be removed and preserved in plasma or saline solution until destruction is completed. Then the bone and cartilage tissue removed are replaced in the cavity and the piece of peripheral bone and cartilage is reinstated. The periosteum is carefully sutured by a running catgut suture and should completely cover the bone.

During the operation, the spread of bone chips around the trochanter and the formation of haematoma under the tractus iliotibialis should be avoided. Otherwise large callus formation around the trochanter may occur.

Postoperative immobilisation is not necessary.

CONCLUSIONS

Judging from the experience gained from 109 cases in which epiphyseodesis of the greater trochanter was carried out at an age varying between four years and eleven months and sixteen years, the operation is indicated when serial radiographs have shown a marked reduction of the articulotrochanteric distance (ATD) as a result of growth disturbance in the capital epiphyseal plate of the femur in moderate infantile coxa vara, in coxa plana and in congenital dislocation of the hip after closed or open reduction. Although permanent fusion of the epiphysis to the metaphysis may be difficult to achieve at the age of

five to seven years, the operation is definitely indicated in this age group. At the end of the growth period the possibilities of preventing the appearance of abductor insufficiency by this operation may have been lost.

SUMMARY

Between 1957 and 1965, epiphyseodesis of the greater trochanter was carried out in the Orthopaedic Hospital of the Invalid Foundation in 109 cases. In thirty of these, the indication was moderate infantile coxa vara, in thirty-two cases it was growth disturbance of the head and neck of the femur in coxa plana, and in forty-seven cases a similar growth disturbance following reduction of congenital dislocation of the hip. The operation was introduced on the basis of experience obtained from the observation of growth disturbances seen in CDH (Figures 1–4). Overgrowth of the greater trochanter as a sequel of growth disturbance in the capital epiphyseal plate of the femur may cause abductor insufficiency and a limping gait. This can be prevented by epiphyseodesis of the greater trochanter if the operation is performed early enough.

RESUME

Entre 1957 et 1965, une épiphyseodèse du grand trochanter a été pratiquée à l'Hôpital Orthopédique de la Fondation des Invalides dans 109 cas. Dans 30 de ceux-ci, l'indication était un coxa vara infantile modéré, dans 32 cas c'était un trouble de croissance de la tête et du col du fémur en coxa plana et dans 47 cas un trouble similaire de la croissance consécutive à la réduction d'une dislocation congénitale de la hanche.

L'opération a été conçue sur la base de l'expérience acquise par l'observation des troubles de la croissance constatés dans la dislocation congénitale de la hanche (Figure 1–4). Une supercroissance du grand trochanter comme séquelle d'un trouble de croissance de la plaque épiphysaire de la tête du fémur peut causer une abduction insuffisiante et un boitillement. Cela peut être prévenu par l'épiphyseodèse du grand trochanter si l'operation est pratiquée assez tôt.

ZUSAMMENFASSUNG

Zwischen 1957 und 1965 wurde bei 109 Fällen im Orthopädischen Krankenhaus der Invalidenstifung eine Epiphyseodese des grossen Trochanter durchgeführt. Bei dreissig Fällen davon war die Indikation

dazu eine infantile coxa vara, bei 32 Fällen waren es Wachstumsveränderungen des Schenkelkopfes und -halses bei einer coxa plana, bei 47 Fällen eine ähnliche Wachstumsstörung als Folge einer angeborenen Hüftgelenksverrenkung (CDH). Die Operation wurde auf Grund der Erfahrungen vorgeschlagen, die man durch die Beobachtung der Wachstumsstörungen bei CDH gewonnen hatte (Abbildung 1–4). Zu starkes Wachstum des grossen Trochanters als eine Folge der Wachstumsstörung in der Epiphysenplatte des Schenkelkopfes können eine Abduktorinsuffiziens verursachen und einen hinkenden Gang. Dies kann durch eine Epiphyseodese des grossen Trochanter verhindert werden, wenn die Operation zeitig genug durchgeführt wird.

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