

SUBLUXATION OF THE HIP TREATED WITH A
STABILIZING OPERATION a. m. LANCE¹⁾

BY

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Those patients who have had a congenital luxation of the hip and who have been treated with reposition a. m. *Lorenz* will not all present an adequate hip-joint in after life.

One group of patients present a slight flattening of the head of the femur, which is chiefly supported by the uppermost extreme part of the acetabulum, so that the contours of head and acetabulum do not precisely correspond to one another. Generally these hips do not give any symptoms in the beginning, but they will certainly give symptoms of arthrosis, denoting insufficiency of the joint, when the patients reach an age of from 40 to 50 years. This age has not, as yet, been reached by any of these patients, however.

In *another group of patients* the head of the femur is more or less severely deformed; frequently it is shaped like a mushroom, though otherwise it is so well contained in the acetabulum that the hip is stable. These patients present surprisingly few symptoms in early life, whereas, in after life, they incur arthrotic changes by which they are sometimes very much disabled.

The third group of patients, which is of particular interest in this connection, comprises the subluxations proper. The acetabulum is flattened, enlarged, sloping more than normally; therefore it contains only a part of the head of the femur. Even though the acetabulum owing to its cartilaginous part affords more support than might be expected after the X-ray photo, the static

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conditions in the joint are bad, for the body weight will aggravate the dislocation in these cases, even if the head of the femur has a normal shape.

Frequently *these patients* are very much distressed by their affection. The symptoms, which must essentially be considered symptoms of insufficiency, consist of a *limp*, besides *pains* and *fatigue* in the hip on walking, and not infrequently also *pains at rest*. Moreover, the patients have an unpleasant sensation of *lacking stability* in the joint.

The same picture as that presented by this last group of patients is witnessed in patients with congenital subluxation in the hip. If we disregard the anamnesis, congenital subluxation cannot be distinguished from the subluxation occurring after reposition of congenital luxation.

In the course of time various authors have endeavoured to work out osteoplastic operations, the principle of which is the formation of a projecting bone shelf above the head of the femur so as to support it and to form a substitute for the partly missing upper edge of the acetabulum.

Already in 1891 *König* made his first attempt at performing a stabilizing osteoplasty in case of luxation of the hip. However, an applicable technique was not devised till 1913 by *Albee* and by *Jones* (1915) in America, by *Spitzzy* (1924) in Austria, and by *Lance* (1925) in France. *Lance* was the first who published a report of afterexamined cases (13 persons from his own clientèle, and 3 from *Ombredanne's*). The results of these operations were on the whole satisfactory (time of observation no more than 18 months at most, however). From recent years may be quoted *Howorth's* statistics (New York, 1935) comprising 35 hips (time of observation 1—9 years, the age of the patients at the time of operation varying from 2½ to 26 years). His chief method quite corresponds to that employed in our orthopedic hospital. In some cases he applied another technique, which yielded inferior results, however. In nearly all the cases the limp persists but generally there is much greater firmness, no pains and no fatigue.

Gill in 1935 reported 125 cases (patients of from 2 to 45

years of age). The average results shall be satisfactory but the after examinations are difficult to judge.

From Boston *Ober* in 1935 reported the results of 20 operations; in opposition to the previously mentioned authors he found, however, that in half of the cases the bone shelf disappeared entirely or partly, which he thinks may possibly be due to its being formed of several minor osteoperiosteal pieces.

Spitzzy in 1934 published 45 cases operated with the special technique, by which a tibial graft is hammered in above the head of the femur (initially, in isolated cases, a graft through the head also). The results shall be excellent, Trendelenburg's symptom for instance being reported to disappear entirely, greater after examinations seem however to have been omitted.

Schede in Leipzig (1935), who applies both *Spitzzy's* and, preferably, *Lance's* method, has operated 35 hips and reports that only one patient subsequently has had symptoms; however, he does not give any definite information with regard to after examination.

Own investigations.

The present material was collected in the orthopedic hospital in Copenhagen; it comprises 61 patients with 68 operated hip joints. The operations were performed during the time from 1927 to 1936, whence the time of observation amounts to from 1 to 9 years, i.e. $3\frac{1}{4}$ years on an average. There were 57 female and 4 male patients, whose age at the time of operation was between $2\frac{1}{2}$ and 37 years.

It should be noted that, in our hospital, the operation has been performed with increasing frequency during the last couple of years, which is not only due to the otherwise increasing number of patients. Hitherto the number of osteoplastic operations amounts to about 90, but only 68 of them are included in this report.

The *indications* were as follows:

- I. a) Congenital luxation of the hip in patients who had previously been submitted to one or several repositions a.m. *Lorenz* but where the head of the femur nevertheless

presents subluxation in the flat and steep acetabulum. 31 after examined cases (cf. X-ray photos 1—2).

- b) Relaxation with nearthrosis in patients, where the nearthrosis affords a very poor support to the head of the femur. In such cases the bone graft is placed at the uppermost edge of the nearthrosis. 3 after-examined cases altogether (cf. X-ray photos 3—4).

II. Congenital subluxation, which becomes manifest as the claims on the patient's use of his limbs, for instance because of his profession, gradually increase. 18 after-examined cases.

III. Whereas the patients of the first groups present very distressing symptoms, such as a severe limp, pains, etc., group III comprises patients with slighter subluxations which, as yet, give few symptoms only, for instance a slight limp and tiredness in the hip after some walking exercise etc. Thus, this indication is almost of a prophylactic nature. 8 after-examined cases altogether (cf. X-ray photos 5—6).

The *technique* on the whole corresponds to that suggested by *Lance* and modified by *Mathieu*. It shall briefly be described:

The patient is placed on the extension table with the affected extremity in an abduction of 30 degrees and maximal inward rotation. An incision is made a.m. *Smith-Petersen*. Subsequently the gluteus medius and the gluteus minimum are carefully detached quite down to the place where the capsule adheres to the uppermost circumference of the joint. The traction on the limb is then increased, and the head of the femur is seen and felt to move downward by 1—2 cm. This renders it possible to detach a little of the capsule from the os ilii, care of course being taken not to open the joint. Now a bone shelf, with its base inward towards the acetabulum, is traced on the outside of the ilium; it must be 2—3 cm. wide and 4—6 cm. long, a border measuring 2—3 cm. being left anteriorly. The external lamina is chiselled through with the chisel at a right angle to the bone, the contour of the projected shelf accurately being followed. Subsequently the chiselling is performed parallelly with the surface of the

bone. A bayonet-shaped chisel will be very convenient in such cases. The shelf is broken as close to the joint as possible and bent down over the capsule. In most cases it will immediately assume the right position; if, however, this meets with difficulties, it is fastened to the capsule by means of a couple of catgut sutures.

Now a 4—5 cm. long portion of the musculature along the crest of the ilium and a little downward on the inner surface of the pelvis is detached; with the chisel the crest and part of the squama of the ilium are split so that a bone graft measuring 4—5 cm. in length and 3—4 cm. in width is obtained. In the majority of cases it is shaped so that it is somewhat narrower downward than corresponding to the crest. This graft, which is eventually split in two parts, is inserted between the pelvis and the shelf, where it is pressed in fairly hard, eventually by means of a couple of strokes of a hammer, in order to fix it securely in its place.

The wound is closed as soon as the gluteal muscles have been reattached as firmly as possible with the help of sutures. Only if there is some oozing hemorrhage, a filiform drain consisting of a strand of fishgut is inserted. A plaster cast is made in the position in which the operation has been performed. The cast is removed after the lapse of two months but the patient is kept confined to bed for another month.

In an isolated case reposition a.m. *Lorenz* was performed immediately prior to the operation, which was then carried out in that position.

The *after examination*. Special importance was attached to the following:

- 1) If possible, i.e. if the distance from the hospital to the patient's residence was not too great, the after examination was performed by the author according to established directions; thus 46 of the 55 after examined patients were examined by myself.

- 2) Those patients, who were beyond reach of the author's personal after examination, were submitted to this examination by their *own practitioner* or, eventually, by the *orthopedic hospital in Aarhus*. They are nine in number.

SCHEME I.

*The results of the after examinations, with a record of the indication
and of the age of the patients at the time of operation.*

Age at time of operation	Indication	Result			
		Hips	good	im- proved	un- changed
≤ 5 years	Subl. after prev. reposition	8	4	1	3
	" " " " with nearthrosis				
	Congenital subluxation				
	Prophylactic				
6—10 "	Subl. after prev. reposition	12	7	2	3
	" " " " with nearthrosis	1	1		
	Congenital subluxation	5	2	3	
	Prophylactic	4	1		3
11—15 "	Subl. after prev. reposition	6	2	2	2
	" " " " with nearthrosis	2	1		1
	Congenital subluxation	6	3	3	
	Prophylactic	1	1		
16—20 "	Subl. after prev. reposition	3	3		
	" " " " with nearthrosis				
	Congenital subluxation	1		1	
	Prophylactic	1	1		
21—25 "	Subl. after prev. reposition	1	1		
	" " " " with nearthrosis				
	Congenital subluxation	3	1	2	
	Prophylactic				
26—30 "	Subl. after prev. reposition	1	1		
	" " " " with nearthrosis				
	Congenital subluxation	2	1		1
	Prophylactic	1	1		
31—35 "	Subl. after prev. reposition				
	" " " " with nearthrosis				
	Congenital subluxation				
	Prophylactic	1	1		
36—40 "	Subl. after prev. reposition				
	" " " " with nearthrosis				
	Congenital subluxation	1	1		
	Prophylactic				
		60	33	14	13

3) The patient's *subjective conception* of the result of the operation, with information concerning the function of the hip joint in the daily work, for instance, how far the patient is able to walk without experiencing pains or fatigue, as compared to the condition prior to operation. Moreover, whether the patient has pains when he is in a position of rest.

4) A *thorough clinical examination* with regard to limp, lordosis, Trendelenburg's symptom, function of the gluteus medius, shortening of the extremity and movements in the hip joint.

5) A *comparison of the X-ray photographs taken prior to the operation, immediately after it, and at the time of after examination.*

The *results* were characterized by the *following* terms:

Unchanged: No change in the subjective and clinical condition.

Improved: Reliable subjective and clinical improvement, whereas the stabilizing bone graft is not quite satisfactory, as it does not reach beyond the middle of the head of the femur, it sits too high up or is eventually bent upward.

Good: Reliable subjective and clinical improvement, a strong bone shelf at the same time neatly enclosing the head of the femur.

The results of the examinations are as follows:

The operations were performed on patients of from $2\frac{1}{2}$ to 37 years of age. In *scheme I* are quoted the indications for the after examined cases in the different age classes. It is evident that the bad results are preferably found in the lowest age classes, which may possibly be due to the somewhat difficult operative conditions met with in such very young children, the capsule for instance being comparatively thick, with more pericapsular tissue, whence it is somewhat difficult to draw the bone shelf far enough downward above the head of the femur. 33 cases are termed *good* and 14 cases *improved*, and in these cases the operations seem to have brought the patients great relief. There are, however, comparatively few cases, where the most conspicuous objective symptoms, namely, limp and Trendelenburg's symptom, have disappeared (cf. *scheme II*).

SCHEME II.

The chief symptoms observed prior to operation and on after examination.

Symptoms	Prior to operation	After Operation			
		Ceased	Much improv.	Un-changed	Increased
Limp	52	7	16	27	2
Trendelenburg's symptom +	50	14	11	18	9 [2 of which prev. without Trend.]
Pains at rest	16	13	2	1	1 [prev. no pains]
Pains in walking	33	15	14	3	1 [„ „ „]
Fatigue in walking	39	14	19	6	

Whereas the persistent limp is partly due to the persistent shortening, which may be improved by an adequate elevation, it may also, together with Trendelenburg's symptom, partly be attributed to insufficiency of the gluteus medius. Virtually in all the cases the after examination revealed a more or less marked reduction of strength in this muscle though no distinct relation between the degrees of the two previously mentioned phenomena.

If these 47 cases despite the slight improvement of the objective phenomena must absolutely be termed *good* or *improved*, it is because of

a) the *considerable subjective satisfaction* with the condition after operation as compared to that prevailing prior to it;

b) the *great improvement of the pains in a position of rest and of the pains and fatigue experienced in walking* (cf. scheme II);

c) the general sensation of increased *stability* of the joint;

d) in addition to the mentioned improvements, the *greater endurance in walking*;

e) finally, the *improvement of the anatomical conditions* in the joint, which should *prevent the ulterior upward displacement* of the head of the femur.

With regard to the moment of improvement after operation it is evident that we must reckon with a certain lapse of time, *mostly 6—12 months*, before the improvement becomes manifest.

The anatomical and röntgenological results.

Upward displacement: Despite the traction effected during the operation the upward displacement of the head of the femur is almost the same after the operation as prior to it. *The bone shelf:* The distance from the shelf to the head varies between 0.2 and 2 cm., generally it amounts to 0.5—1.0 cm.

Scheme III shows how great a portion of the caput projected beyond the uppermost border of the acetabulum (or the nearthrosis) prior to operation, and how much projected outside the lateral limit of the bone shelf at the after examination. In by far the majority of cases the bone shelf presents good lateral projection.

Shape and size of the bone shelf on after examination: In 36 cases the bone shelf was strong, forming a fine, inferiorly concave curve.

In 10 cases the shelf was slender and somewhat short, in a couple of cases turning upwards though apparently affording satisfactory support.

In 9 cases the shelf was almost rudimentary, hardly affording any support.

In 4 cases the bone shelf was almost invisible after the operation and was not detected at all by after examination.

In 1 case the edge of the shelf was fractured immediately after the operation (possibly a transformation zone) and approximately unchanged on after examination. However, the basal part seems to afford a good support.

The growth of the shelf:

In 25 cases the after examination revealed that the shelf had markedly increased in size and acquired a shape corresponding to the caput, as compared to the condition immediately after operation (cf. the X-ray photos 7—12).

In 4 cases the bone shelf was sclerosed corresponding to the conditions of pressure, but otherwise unchanged.

In 8 cases the after examination revealed that the bone shelf had diminished in size.

If the bone shelf, as was previously mentioned, in some cases is very small or fails to appear on the X-ray photo, it must be

kept in mind that there may nevertheless exist a small shelf which, in a certain projection, is covered by the ilium.

Complications:

Suppuration: occurred in two cases only, being in one case accompanied by ankylosis though in a good position, whence this case was termed improved, as the other conditions tend to favour this notion. In the other case the motility became very satisfactory, whence the result was termed good.

Arthrosis: Deformation with gradual disappearance of the caput was demonstrated in 2 cases.

One case (a 14 years old patient), however, was considered improved, because the subjective result was satisfactory and the stump of the collum was well supported in the acetabulum + shelf, the motility in the joint moreover being almost free.

SCHEME III.

Part of the caput femoris outside the acetabulum (or nearthrosis) prior to operation, and outside the bone shelf on after examination.

Part of caput outside	Prior to operation	At after examination
6/6 > 5/6	12	5
5/6 > 2/3	6	2
2/3 > 1/2	12	1
1/2 > 1/3	23	7
1/3 > 1/6	7	13
0	0	32
	60	60

The other case (a 10 year old patient) was termed unchanged, for the subjective condition was unaltered and there was ankylosis in the joint in but a few degrees' abduction so that the condition of this patient was almost worse than before.

Other arthrotic changes were detected in 8 patients only.

In the first case (an 18 year old patient) the after examination performed 5½ years later revealed irregular contours of the caput and some cyst formation in it.

In the second case (patient aged 10), where the caput prior to operation had presented irregular contours, this irregularity was found to be aggravated when the patient was submitted to after examination 2½ years later. As these two cases presented a subjective improvement and the impairment of motility was moderate, they were termed improved.

In the third case (patient aged 13) the after examination performed 9 years later revealed a moderate erosion of the caput but good function; the result was termed good.

In the 4th case (patient aged 29) a so-called cyst was detected prior to operation but had disappeared when the after examination was performed 5½ years later. The result was termed good.

In the 5th case (patient aged 37), which was termed good, a small cyst was detected in the caput both prior to operation and on after examination (3 years later).

In the 6th case (patient aged 9) the examination performed prior to operation revealed deformity and flattening of the caput which, on after examination a twelvemonth later, apparently had acquired a better shape. As the motility was free, it was termed good.

In the 7th case (patient aged 14) the somewhat uneven caput presented halisteresis immediately after the operation. The after examination performed a twelvemonth later revealed that the halisteresis had disappeared and the motility was free. The result was termed improved.

In the 8th case (patient aged 12) there was a question of bilateral operation. The after examination performed 18 months later revealed a considerable narrowing of the joint fissures and irregular contours of the halisteretic capita femores besides severe impairment of motility. As the result of the operation could not be termed satisfactory it was termed unchanged.

Impairment of motility of the joint appart from the quoted cases was detected in a few others, where the impairment was slight.

Luxation above the bone shelf (2 cases).

In one case (patient aged 5) the luxation was detected on removal of the plaster cast. After the lapse of 2 months reposition is performed and the after examination reveals a good bone shelf covering more than half of the caput. As the subjective result is satisfactory and the motility of the joint but slightly impaired, the result is termed good.

In the other case (patient aged 4), which was termed unchanged, the X-ray examination performed 3 years after operation revealed that the caput had slipped upward and placed itself above the very slightly projecting shelf. In this case a correcting osteotomy must be taken into consideration. The subjective result is bad.

The following 11 cases (13 hips) were termed unchanged:

Case 1: *Disappearance of the caput* (previously described).

Case 2: *Luxation* above the shelf (described above).

Cases 3, 4 and 5: *Bone shelf clumsy, bent upward*, at a distance of > 1.5 cm. from the caput, covering $< \frac{1}{2}$ of it only; subjectively unchanged.

In these cases a correcting osteotomy may, perhaps, later be resorted to.

Cases 6, 7, 8 and 9: *Rudimentary bone shelf* and subjectively unchanged condition.

Case 10: *Bilateral operation*; severe arthrosis (previously described).

Case 11: *Bilateral prophylactic operation*. On one side the bone shelf is unsatisfactory, and the patient continues to complain of some painfulness.

SUMMARY

The author records investigations of plastic operations of the acetabulum performed on 61 patients with subluxation of the hip joint (68 hips). The time of observation is 1—9 years. 55 patients (60 hips) were submitted to after examination.

The indication was somewhat protracted and severe symptoms of insufficiency both on a congenital basis and after reposition of congenital luxation of the hip. For a minor group (8 of the after examined hip joints) the indication was subluxation and bad static conditions in the joint which, keeping in mind the experience gained from cases of subluxation, must be expected later to give rise to considerable discomfort, even though the patients at the time of operation had not experienced it yet. This indication is therefore termed »prophylactic«.

33 hips are termed good, 14 improved, and 13 unchanged or, in isolated cases, exacerbated. The results do not distinctly suggest that the age of the patients is of any importance (at the moment of operation it varied between $2\frac{1}{2}$ and 37 years).

Only in a minor number of cases the operation results in

the complete disappearance of limp and of Trendelenburg's symptom; however, according to these investigations it seems nevertheless to be very appropriate for bringing about painlessness and greater stability in the joint and for highly increasing the patients' endurance in walking and other exercise.

RÉSUMÉ

L'auteur rend compte de recherches concernant l'opération plastique de l'acétabule pratiquée chez 61 malades présentant des subluxations de l'articulation de la hanche (68 hanches). La durée des observations s'est étendue sur 1 à 9 ans. 55 malades (60 hanches) ont été soumis à un examen ultérieur.

La maladie se manifesta sous forme de symptômes graves d'insuffisance, souvent d'assez longue durée, aussi bien sur la base congénitale qu'après reposition de la luxation congénitale de la hanche. Pour un petit groupe (8 des hanches examinées ultérieurement), la subluxation et de mauvaises conditions statiques dans l'articulation en étaient les symptômes. A la suite des expériences acquises des cas de subluxation, ceux-ci devaient sans aucun doute subir plus tard des inconvénients graves, même si le malade, au moment de l'opération, ne les avait pas encore observés. C'est pourquoi cette indication a été qualifiée de »prophylactique«.

33 hanches sont caractérisées comme bonnes, 14 améliorées et 13 nonchangées ou, dans quelques cas isolés, aggravées. Les résultats ne semblent pas indiquer avec certitude que l'âge des malades présente quelque importance (au moment de l'opération, il variait entre 21½ et 37 ans).

Dans un petit nombre de cas seulement, l'opération a provoqué la disparition complète de la boiterie et des signes de Trendelenburg; de toutes façons, ces recherches semblent prouver que l'intervention a en tout cas fait cesser les douleurs, qu'elle a amené une plus grande stabilité de l'articulation et qu'elle a accru l'endurance du malade à l'égard de la marche et des autres exercices.

ZUSAMMENFASSUNG

Verfasser berichtet über Untersuchungen über plastische Operationen am Acetabulum, die an 61 Patienten mit Subluxation des Hüftgelenks vorgenommen wurden (68 Hüftgelenke). Die Beobachtungszeit betrug 1—9 Jahre. Auf 55 Patienten (60 Hüftgelenke) waren Nachuntersuchung vorgenommen.

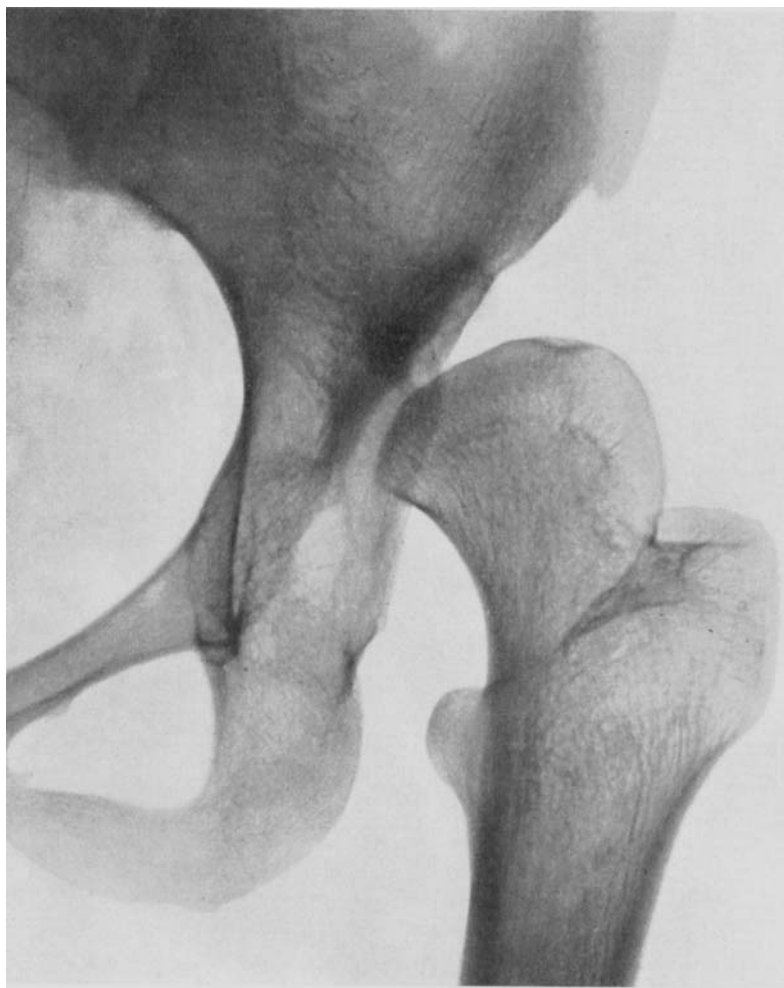
Die Krankheitserscheinungen waren ziemlich langwierige und ernste Insuffizienzsymptome, sowohl auf kongenitaler Basis wie nach Reposition einer kongenitalen Hüftgelenksluxation. Bei einer kleineren Gruppe (8 von den nachuntersuchten Hüftgelenken) waren die Krankheitserscheinungen Subluxation und schlechte statische Verhältnisse im Gelenk, von denen man angesichts der an Subluxationsfällen gemachten Erfahrungen erwarten musste, dass sie später Anlass zu beträchtlichen Beschwerden geben würden, obwohl die Patienten zur Zeit der Operation davon noch nichts gemerkt hatten. Diese Indikation wurde daher als »prophylaktisch« bezeichnet.

33 Hüften wurden als »gut« bezeichnet, 14 als »gebessert« und 13 als »unverändert« oder (in vereinzelt Fällen) als »exazerbiert«. Aus den Resultaten lässt sich nicht mit Bestimmtheit der Eindruck gewinnen, dass das Alter der Patienten irgendwelche Bedeutung hat (zu dem Zeitpunkt der Operation schwankt es zwischen 2½ und 37 Jahren).

Nur in einer kleineren Anzahl von Fällen hatte die Operation das völlige Verschwinden des Hinkens und des Trendelenburg'schen Zeichens zur Folge; dennoch scheint sie, nach diesen Untersuchungen zu urteilen, sehr wohl dazu angetan zu sein, Schmerzlosigkeit und eine grössere Stabilität im Gelenk herbeizuführen und die Ausdauer des Patienten beim Gehen und bei anderen Bewegungen in hohem Grade zu steigern.

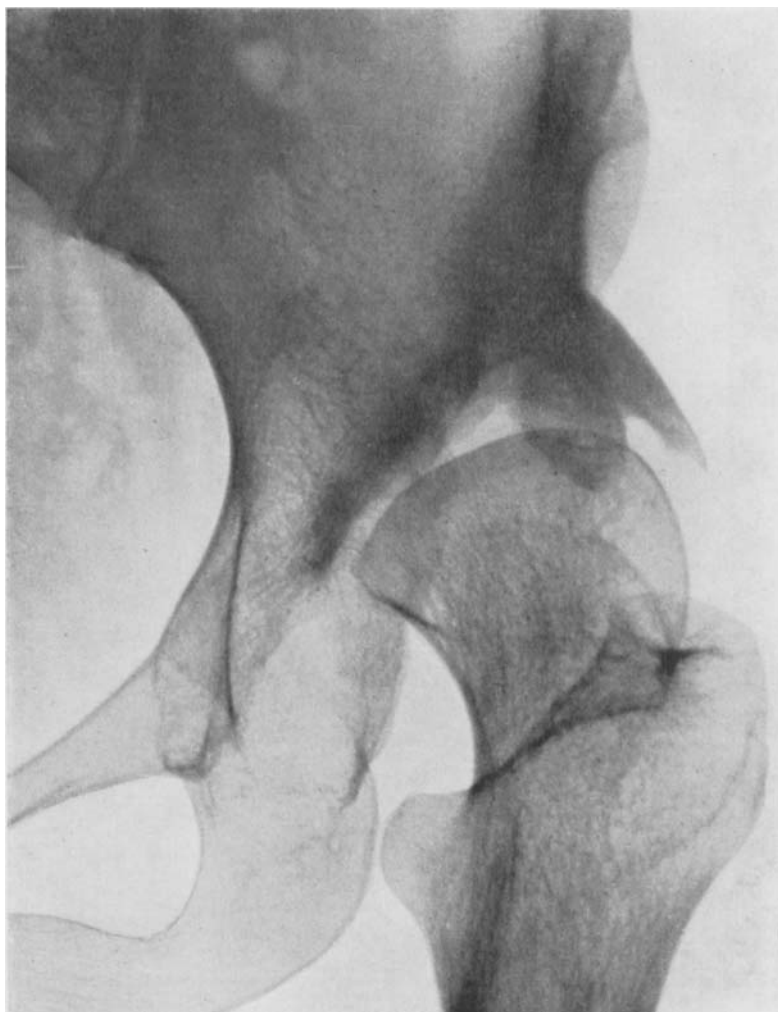
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X-ray photo 1.

Case of relaxation prior to the operation (patient aged 23).



X-ray photo 2.

The same case as the preceding on after examination performed
2½ years later.



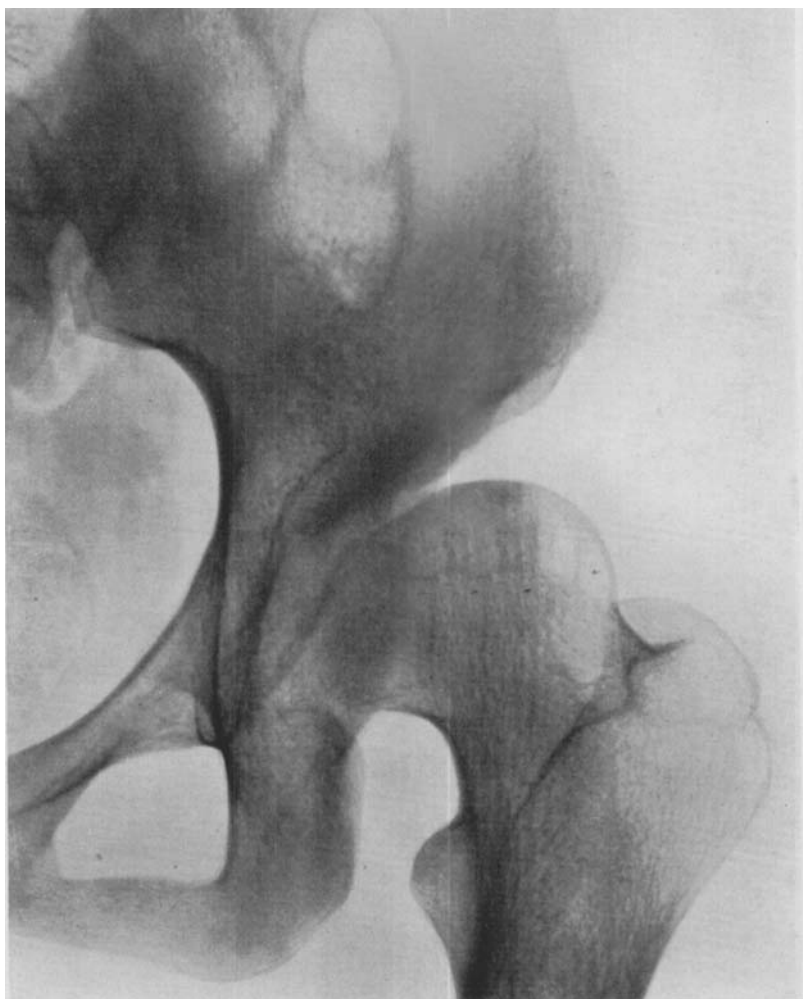
X-ray photo 3.

Formation of nearthrosis prior to operation (patient aged 13).



X-ray photo 4.

The same case as the preceding on after examination performed
3 years later.



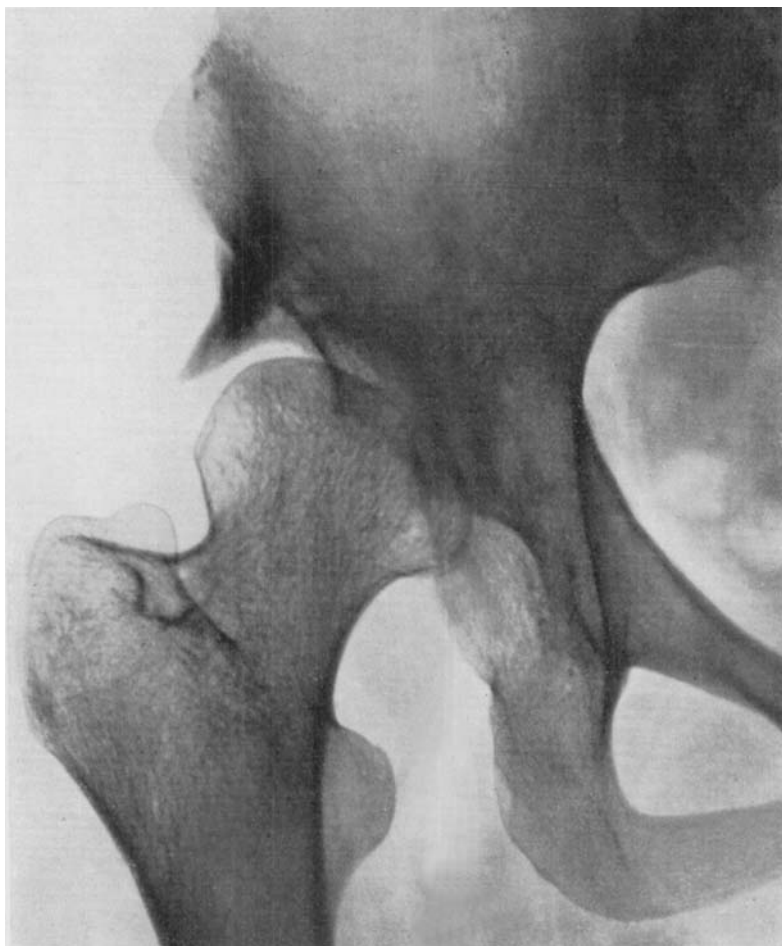
X-ray photo 5.

“Prophylactic” indication (patient aged 16).



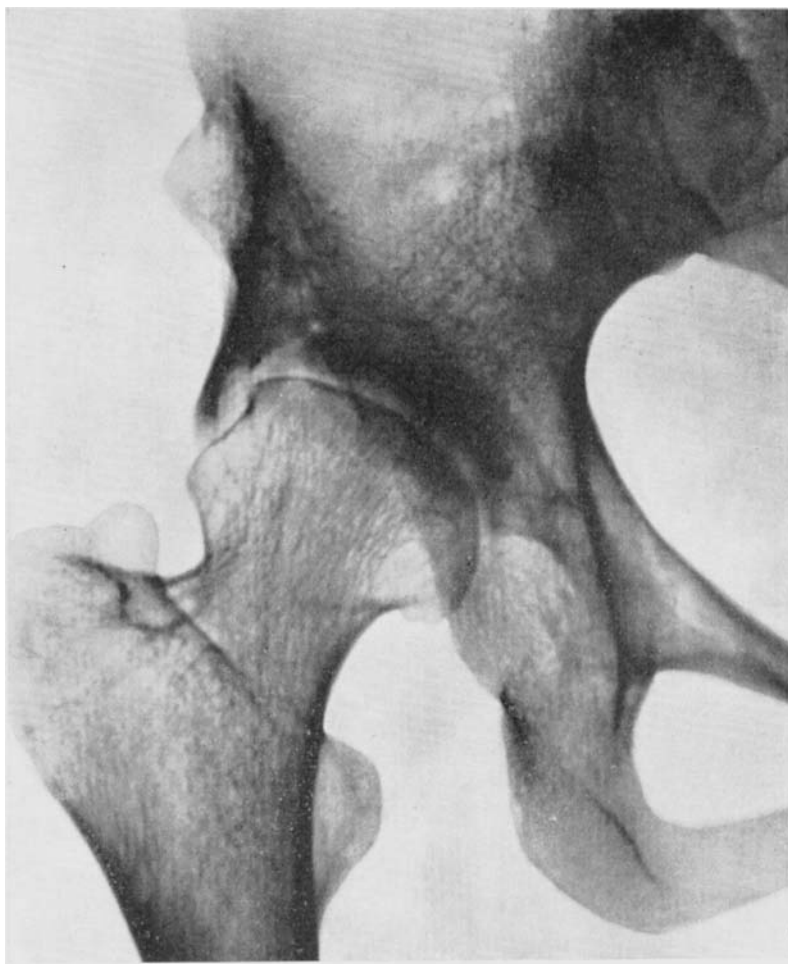
X-ray photo 6.

The same case as the preceding on after examination performed
4½ years later.



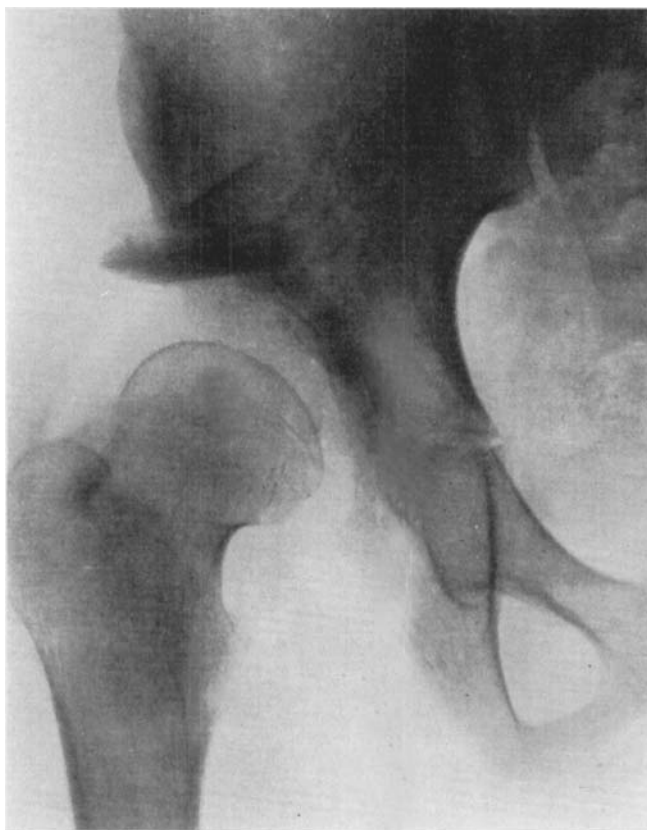
X-ray photo 7.

Bone shelf immediately after the operation (patient aged 18).



X-ray photo 8.

The same case as the preceding on after examination performed
5½ years later. *Complete motility in the joint.*



X-ray photo 9.

Bone shelf immediately after the operation (patient aged 9).



X-ray photo 10.

The same case as the preceding on after examination performed
a twelvemonth later.



X-ray photo 11.

Bone shelf immediately after the operation (patient aged 7).



X-ray photo 12.

The same case as the preceding on after examination performed
2 years later.