

## LATE RESULTS OF MANIPULATIVE TREATMENT OF CONGENITAL DISLOCATION OF THE HIP.

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IN reporting upon a series of 49 cases of congenital dislocation of the hip, involving 61 joints, treated by me between 1903 and 1916 inclusive, at the Royal and Royal National Orthopædic Hospitals, I am fully conscious of the many failures that have attended my earlier endeavours. The causes of these failures are in part general and in part individual.

From 1903-10, I was largely influenced by the Lorenz technique which was in vogue at that time. With the meagre instruction derived from observing Lorenz reduce one case in London, I embarked upon the treatment of a deformity which had previously baffled surgeons whatever method they had employed.

In 1903, orthopædic surgery was in a very different condition from that in which we find it to-day. The original British Orthopædic Association was defunct, and no new association had been formed. In America and on the Continent the opportunities for



FIG. 13.

the interchange of thought, methods, and results were well organized. I mention this, not to exonerate myself from blame, but because the results of treatment in these 49 cases do not fairly represent the results which are now being obtained, and by which the success or failure of manipulative replacement should be judged. Further, in my early cases no *x*-ray control was possible, for the reason that no *x*-ray installation was provided at the Orthopædic Hospital at that time.

From the experience thus gained, I am of opinion that no surgeon should attempt the treatment of a congenitally displaced hip unless he is in able to obtain *x*-ray proofs of his positions in plaster, and of the subsequent growth of the acetabulum and upper end of the femur, and unless he has had considerable opportunity of observing the methods and results of others. In this way only can the percentages of successes be increased.

Of the 49 cases, 45 were females and 4 were males. The left hip was dislocated 28 times, the right 9, and both 12 times—figures which show an unusually large number of left-sided cases. For the purposes of this paper I have endeavoured to re-examine all these cases within the last few months: the patients have been invited to attend the hospital and, if poverty has been pleaded, the railway fare has been offered as an inducement.

Eighteen cases, involving 23 joints, have failed to give me the opportunity of re-examination. I do not regard all these cases as failures. Some, no doubt, are; but others I observed for many years before the war, and showed radiograms of some of them at the British Medical Association meeting at Aberdeen in 1914, as cures. Of others again, I have had satisfactory reports from their medical attendants. But without recent x-ray confirmation they cannot be brought into any scientific classification, and I have therefore excluded from my list all cases that have not been recently examined.



FIG. 14.

As an example showing how an error might otherwise creep in, *Fig. 13* represents a left unilateral dislocation in a female, age 2½, ten years after reduction: it shows that four-fifths of the head only is covered by the acetabulum, whereas *Fig. 14*, taken three years after reduction, shows the head completely surmounted by the acetabulum.

There remain for classification 31 cases, involving 38 joints. Classification so far has been simple; but further detailed classification of anatomical and functional results, as other observers have found, is difficult. The usual anatomical classification is divided into: (1) Anatomical cures; (2)

Excentric reductions; (3) Anterior transpositions; (4) Relapses. Such may have served a useful purpose in the past, but is quite inadequate with our present knowledge. It came into being when surgical thought centred upon the dislocation as being the essential deformity, and the retention of the replaced head by the acetabulum as the highest ideal in the treatment. Such a classification is very one-sided and, though serving to describe the reaction of the acetabular elements to the stimulus of a replaced head, entirely ignores the reaction in the head and neck of the femur to the forces employed in reduction, and the stresses and strains of acetabular cohabitation.

#### CLASSIFICATION OF CASES.

GROUPS	NO. OF CASES	PER- CENTAGE	AVERAGE AGE
1. Concentric reduction with normal head and neck .. ..	10	26.0	4.1
2. Concentric reduction with changes in the head and neck .. ..	13	34.0	5.1
3. Excentric nearthrosis .. ..	5	13.0	4.5
4. Anterior transpositions .. ..	4	10.5	4.8
5. Posterior dislocations .. ..	1	2.5	6.5
6. Loss of head and neck .. ..	1	2.5	2.9
7. Unreduced dislocations .. ..	4	10.5	6.75
Total Cases .. ..	38	--	--

## CONGENITAL DISLOCATION OF THE HIP 17

In examining the radiograms of late results, I have been struck by the infrequency of anatomical cures as evidenced by them. By a strict definition, an anatomical cure is one which an *x*-ray examination shows is indistinguishable from a normal hip. To refer to two points only: a normal acetabulum shows a double contoured roof; after reduction of a congenital dislocation, this double contour is of the rarest occurrence. I do not think I have seen it more than a few times. If we allow this variation, and such a change as the persistence of some mammilation of the roof to be within the normal, then the percentage of anatomical cures materially increases. Though we may reasonably include these and some other minor changes as being within the normal limits of anatomical variation, the grosser changes in the head and neck of the femur that occur in a large proportion of so-called anatomical cures would seem to demand a class of their own.

For this reason, I consider the above classification, which is employed for my cases, to be more satisfactory.

GROUP 1.—Of 38 joints recently examined, 10 only showed concentric reductions with normal heads and necks, whilst 13 showed concentric reduction with changes in the heads and necks, making 60 per cent of concentric reductions; but only 26 per cent of anatomical cures.

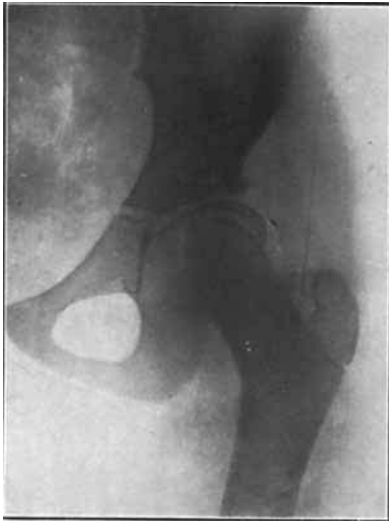


FIG. 15.



FIG. 16.

*Fig. 15* represents a case of concentric reduction with normal head and neck. It is from a left unilateral case of a girl, reduced at the age of 4, *x*-rayed nine years after reduction. Function of the joint is complete.

*Fig. 16* shows the opposite side for comparison.

*Fig. 17* is a case of a girl with bilateral dislocation, reduced at the age of 4 years 8 months, and re-examined eight years after. The horizontal direction of the epiphyseal cartilage will be noted, and the entrance of the inner and lower angle of the neck into the acetabulum. It would appear that this horizontal direction of the epiphyseal cartilage has protected the head from displacement, and that the projecting angle of the neck has acted as a buttress preventing slipping of the head.

*Fig. 18* shows a left unilateral dislocation in a female, reduced when 4½ years old, and *x*-rayed nine years later, which shows a concentric reduction, with normal head and neck with a crescentic epiphyseal line.



FIG. 17.



FIG. 18.

## CONGENITAL DISLOCATION OF THE HIP 19

*Fig. 19* is from a case of left unilateral dislocation in a female, age  $7\frac{1}{2}$ , and shows the result twelve years later. The acetabulum is shallower than normal, but the

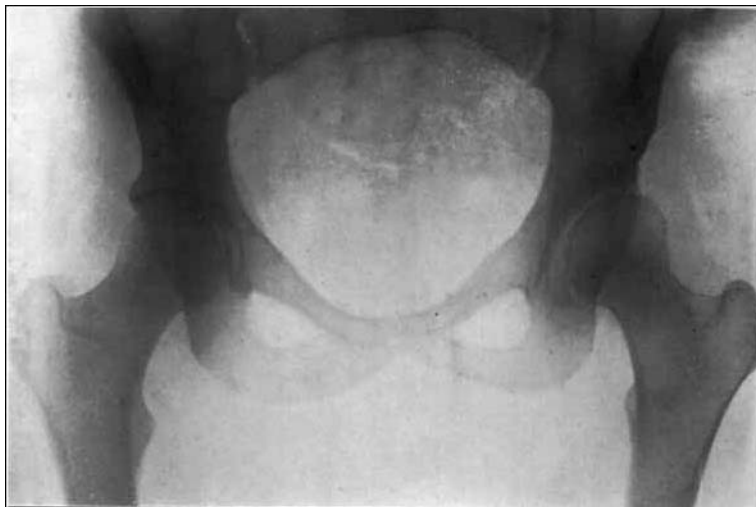


FIG. 19.

head and neck are well formed and the reduction is concentric. The functional result is excellent.

*Fig. 20* represents the result five years after reduction of a left unilateral dislocation in a patient, age  $3\frac{1}{2}$  years. This case had been reduced and kept in plaster-of-Paris



FIG. 20.

elsewhere ; but retention failed. Fibrosis of the adductors necessitated their tenotomy before re-reduction could be obtained.

GROUP 2.—Turning to the concentric reductions with changes in the head and neck, a great variety of pathological lesions is found. The commonest is a diminution of the angle of inclination, and this is present in nearly all cases. Further changes are buffer-shaped heads, and flattening and spreading of the capital epiphysis; absorption of the neck; and, less frequently, an increase in the angle of declination.

*Fig. 21* is from a bilateral case in a female, reduced at the age of 7 years 2 months. Radiogram taken six years later. The left side shows a concentric reduction with coxa vara, the right an excentric ne-



FIG. 21.

arthrosis with varoid neck and atrophy of head and neck.

*Fig. 22* shows a buffer-shaped head on a shortened neck, from a bilateral dislocation in a boy, reduced at the age of  $6\frac{1}{2}$ , and x-rayed thirteen and a half years later.



FIG. 22.

GROUP 3.—In the excentric nearthrosis cases are included those which show changes in the acetabulum. These changes consist of an absorption of the upper part of the acetabulum, so that the femoral head forms a new joint within the limits of the original acetabulum, but not concentric with its centre. Changes in the head and neck almost invariably accompany the changes in the acetabulum, and for the most part consist of a partial absorption of the head and neck. The changes are similar to those occurring in a dry arthritis, but there is no evidence to suggest that they are of tuberculous origin.

Thus, *Fig. 23* represents a case of a female, age  $5\frac{1}{2}$ , left unilateral, x-rayed thirteen



FIG. 23.

## CONGENITAL DISLOCATION OF THE HIP 21

years after reduction, which shows an excentric nearthrosis with well-shaped head directed at an angle of  $130^{\circ}$  to the shaft of the femur, with almost complete absorption of the neck. The upper end of the femur is bent laterally in the trochanteric region.



FIG. 24.



FIG. 25.

Compare with this *Fig. 24*, a bilateral case of a female, age  $8\frac{1}{2}$ , *x*-rayed nine years after reduction. The right hip, here represented, was reduced easily; the left gave much trouble. The right shows a coxa vara of severe degree and much shortening of the neck; but the head is well formed. (? Place this in *Group 2*, i.e., concentric reductions with changes of head and neck.)

*Fig. 25* is a left unilateral dislocation in a female, age 5, *x*-rayed ten years after reduction. It shows an excentric reduction with shortening of neck, without alteration of the angle of inclination, and with a well-formed rotund head. The neck is constricted about its centre.



FIG. 26.

*Fig. 26* is from a left unilateral dislocation in a girl, age  $4\frac{1}{2}$ , *x*-rayed eight years later. There was marked coxa valga when reduced. One year and a half later the hips were symmetrical. There was then interrupted observation. Now the radiogram shows an excentric nearthrosis with high valgus and the capital epiphysis displaced outwards.

GROUP 4.—With reference to anterior transpositions, I have noted few changes in the head and neck, which probably accounts for the extraordinarily good functional results.

GROUP 5.—Posterior redislocations conform in behaviour to the untreated cases, except that changes in the length and direction of the neck are common.



FIG. 27.

*Fig. 27* is an example: bilateral dislocation, boy, reduced at 6½ years. Radiogram taken thirteen years later. The right femoral head is buffer-shaped, the neck much shortened and at an angle of 100°. Clinically, extension is short by 15°, but flexion is complete.

GROUP 6.—Complete loss of the head and neck is rare. I have one case only to record, a right unilateral, and a radiogram is given in *Fig. 28*. The patient was a boy age 2½, with multiple deformities. The illustration was taken sixteen years after reduction. Unfortunately I have no radiogram of the original condition. Notwithstanding the loss of the head and neck, the lateral apposition of the side of the femur to the pelvic wall affords a stable joint. He plays football, as he says, better than most, and is very much pleased with the result. Except that there is no scar I should have guessed that he had wandered to another's care and had his head and neck excised. *Fig. 29*, which represents

his opposite hip, shows considerable contraction of the centre of the neck, with an expanded head.



FIG. 28.

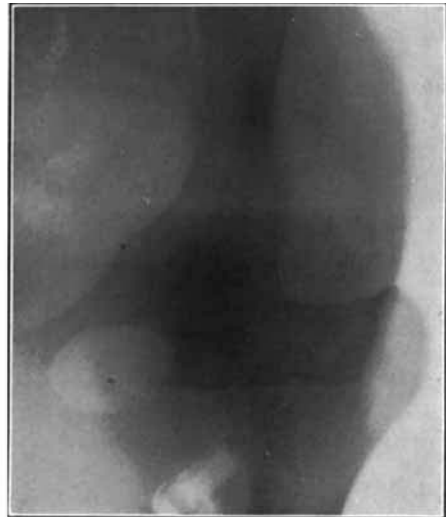


FIG. 29

*Fig. 30* is from a girl, age 10½ years, in whom I fractured the neck, treating her by extension with a long Liston. The radiogram gives the appearance eleven years afterwards—a posterior dislocation, without obvious change in the angle of inclination. She is certainly no worse than she would have been if nothing had been done.



Of the functional results it is much more difficult to speak, because the personal element largely enters into the question.

No orthopædic surgeon can be successful unless he is an optimist ; and it is very difficult to dissociate optimism from after-results. Further, it is essential that any classification that is to be intelligible to the ordinarily retentive memory should be short. Hence, for statistical purposes we are compelled to adopt such a classification as good, fair, or bad.

In general terms :—

1. Concentric reductions without any changes in head and neck are good. In fact, I think they are very good.

2. Concentric reductions with changes in head and neck vary ; some are good, others fair. I have to record one bad result in this class—an ankylosis in external rotation and abduction with coxa vara of 90°.

3. Excentric reductions depend upon the degree of absorption. Three cases show good functional results and two fair. It is still too early to say whether progressive arthritic changes will not vitiate these early satisfactory results. I am not optimistic on this point.

4. Anterior transpositions give good functional results as a rule.

5. Posterior redislocations are indistinguishable from untreated cases.

I wish to record one case which showed every prospect of a concentric reduction with normal head and neck, which was attacked with anterior poliomyelitis of the same limb, and an excentric nearthrosis resulted.

My method of reduction was founded upon Lorenz's technique : gradually forces were diminished and muscles spared, so that my later cases were reduced by a much more gentle and less disruptive process than the earlier ones. Except in very few cases where I have used internal rotation after Lange's method of retention, I have employed a short spica reaching from the waist to above the knee. Early locomotion on a high patten has been adopted. In bilateral cases the period of retention in plaster has been shortened as much as possible—from three to six months. In unilateral cases I have kept up retention for much longer than is usually accepted—eighteen months to two years. With few exceptions retention has been maintained in 90° flexion, 70° abduction, and an indifferent rotation. Werndorff's axillary abduction has promoted successful retention in difficult cases where the acetabular roof has been markedly deficient.

After removal of the plaster, abduction in walking has been secured by applying a 1½-in. patten to the sound side.

I have attached great importance to a plaster bed made according to the formula 90, 70, 0, up to the end of the third year after successful retention. In unilateral cases one hip only has been enclosed in the plaster. Exceptional cases have been treated with modifications according to the structure and stability of the joint ; but, in general, the above may be taken as routine.

I have fractured some necks, but no femoral shafts : I have had no nervous or arteriovenous complications. There has been one tragedy—the death of a patient, age 8½, after reduction, from double pneumonia, without a post-mortem examination.



FIG. 30.