Section of Orthopædics

President K I Nissen FRCS

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Treatment of Congenital Dislocation of the Hip in the Newborn

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Diagnosis and Treatment

It has long been known that a click can be felt occasionally in one or both hip-joints in the newborn child. In the 1940s this question was approached anew by the Italian pædiatrician, M Ortolani, a former pupil of V Putti.

There are several reasons why the clicking hip-joints in neonates failed to arouse the interest of orthopædic surgeons: (1) The orthopædic surgeons were not convinced that the click in the hip-joint really meant that a hip-joint capable of dislocation was involved, because it was not possible to confirm this by X-rays. (2) There were no grounds for any immediate treatment of the clicking joints. The treatment was considered difficult or even dangerous. (3) Even assuming that clicking in the hip-joints of neonates was the first stage of a manifest dislocation, no one could prove that the results of immediate treatment would be better than those of later treatment undertaken during the first year of life. (4) The majority of orthopædic surgeons had accepted the theory that the cause of hip-joint dislocation was a dysplasia of the hip already present at birth, and that the dislocation developed later.

The city of Malmö has about 240,000 inhabitants. More than 99% of the children are born in the city's one obstetric department which is linked to the General Hospital.

Even before 1952 all neonates were examined as a matter of routine by a pædiatrician and in the last ten years the examination has also included the hip joints (von Rosen 1957). The examination is carried out once during the first three days after birth, and then again when the mother leaves the clinic. Those neonates in whom the examination reveals a clicking of the hip-joint are X-rayed and we have developed a technique by which we can check and in most cases also prove the existence of an unstable hip-joint. One method is that described by Andrén and myself (1958). Andrén has since described other techniques of examination (1961). The most important point is that the joint head should be in the dislocated position when the examination is made.

Those infants who have a dislocation of the joint or, as others prefer to call it, a subluxation of the joint, are transferred to the orthopædic department for further control and treatment. They are placed in a special splint (Fig 1) which we have used since 1956. The child must not be removed from the splint until the doctor concerned has confirmed by several examinations that the joint is stable. The child is cared for at home, and hospitalization is not required.

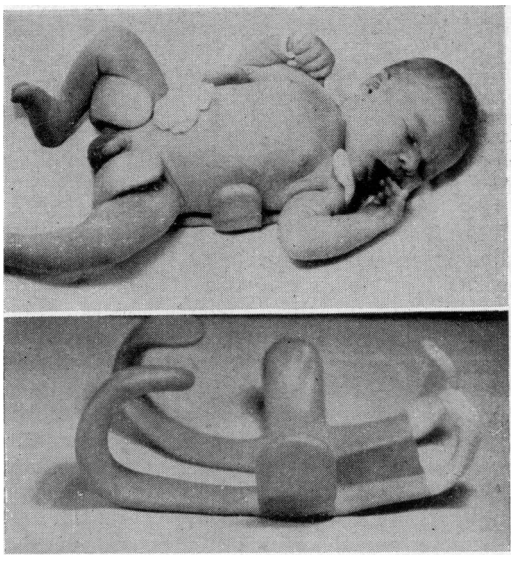

Fig 1 *The aluminium splint which we have used since 1956 to keep the hip-joints in the reduced position. The splint is fitted with a rubber cover, so that the child can be kept clean without removing the splint*

In the autumn of 1959 when we X-rayed a child with hip-joint dislocation we found, apart from laxity of the hip, that there was a similar laxity of the pelvic joints. After drawing apart and pushing together the abducted legs in the long axis, a remarkable difference was seen in the width of the symphysis and also in the other pelvic joints (Fig 2). This resembled the instability of the symphysis seen in some women in late pregnancy or in the early postpartum period. Andrén (1962) found later that this type of laxity was present in the pelvic joints of so many neonates with hip-joint dislocation that the phenomenon may be regarded as statistically proven.

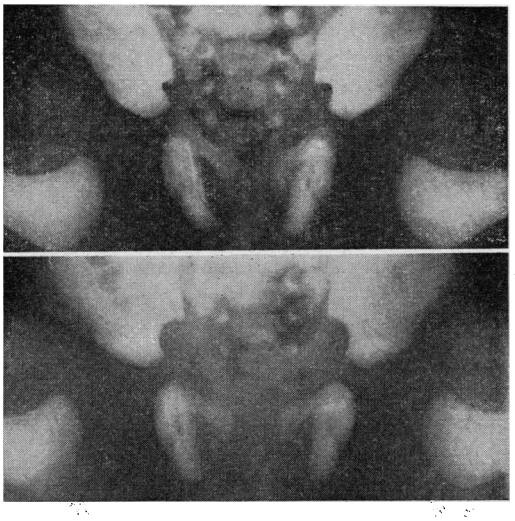

Fig 2 *Radiograph of a newborn girl with bilateral hip-joint dislocation. In the upper picture the legs were pushed towards the middle, in the lower they were drawn sideways. Both pictures show the difference in distance between the proximal femur ends and the width of the symphysis*

There is no doubt that the laxity in the pelvic joints in pregnant women has a hormonal origin even if the biological process is not yet clear. Consequently we carried out hormonal tests on these children and came to the conclusion that they have a hormonal picture which differs from that of normal children. Andrén & Borglin (1961) have shown that neonates with hip-joint dislocation release œstrone and œstradiol-17 in the urine in larger quantities than normal infants. In these examinations the difficulty was, and is, to collect the total output of urine in the first days of life.

I have recently completed a report on the results of our experience up to the spring of 1960 (von Rosen 1962). My article closed with conclusions formulated on four points. The following account relates how far our present experiences agree with these findings.

(1) *Congenital hip-joint dislocation can be diagnosed clinically immediately after birth and the diagnosis confirmed radiologically by employing a special technique*

Up to date we have clinically diagnosed 68 cases of congenital hip-joint dislocation out of a total of 31,200 neonates. Of these, 53 were girls and 15 were boys. In addition we have had 2 teratological cases with various other malformations. In all these cases the clinical diagnosis was confirmed by X-ray.

Cases may be overlooked in the first routine examination. I reported one such case previously (von Rosen 1962). This was a girl who had asphyxial convulsions immediately after birth and thus was not subjected to the customary routine examination.

A second case was missed later. This child, as far as we know, was examined in the routine way. When she began to walk at twelve months she was found to be limping on the right side. It is hard to say why this case was not discovered in the obstetric department.

Further undiagnosed cases have not occurred in Malmö. Co-operation with the general practitioners of the city is extremely good, so that any possible undiagnosed cases which come to their knowledge would be referred to us.

(2) *If the affected joint is reduced during the first two or three days after birth and held reduced for a period not exceeding three months the joint will remain stable*

This conclusion may be illustrated by three cases: In the first two the hip-joints were felt to be stable two weeks after birth and the splints were therefore removed for a trial period. At control examinations after one and three weeks the joints again felt unstable on one side. Both children were therefore replaced in splints. In one case the joint became stable again within two months and developed normally; in the other the joint did not become stable until ten months later. Since then it has developed favourably although a slight subluxation still persists. In both these cases I am convinced that the 'atypical course' is to be traced back to the fact that the splint was removed too early.

The third case was that of a girl with a birthweight of over 5 kg (11 lb). She was flaccid and bloated and had multiple hæmangiomas on the face and neck. Clicking was present in both hip-joints. The splint was retained for three and a half months. The reason for retaining it for more than three months was that the child was very limp both in the muscles and in all her joints. Four months later the X-ray revealed a subluxation of the right side. After further treatment on an abduction frame the joint has developed satis-

factorily. The mother of this third case had taken thalidomide during her pregnancy. It is, however, not clear whether this has any significance, as pronounced hereditary characteristics are present and this child is abnormal in appearance and development apart from the dislocation.

Is it really necessary to treat all unstable hip-joints immediately after birth? It cannot be doubted that some reduce spontaneously; the Swedish pædiatrician, Palmén (1961), among others, has proved this. In our experience it is impossible to forecast which of the unstable hip-joints require treatment and which do not. In my opinion, since the treatment is so simple to perform, it is correct to treat each one. In no case has it proved difficult to carry out the treatment at home.

(3) *This treatment probably leads to a normal development of the hip-joint*

As stated, I have reported (1962) 3 cases in which the X-ray appearances did not become quite normal, and I believed this to be caused by an insufficient fixation of the reduced hip-joints. All 3 are among our first 8 cases. The mothers at that time were allowed to take the child off the frame for bathing. I pointed out, however, that the later X-ray appearances of these hips were by no means poor.

A fourth patient was treated in the usual way and at the age of 1 year the X-rays were normal. Later on a subluxation deformity of both hip-joints developed, caused by cerebral palsy.

Apart from the above, follow up has shown a normal X-ray picture in all our cases. Bearing in mind that one must always be careful when speaking about a normal development, I prefer to state that this treatment 'probably leads to normal development'. On the other hand, I cannot see any reason why the hip-joints which now, after such a long period of observation, show a normal X-ray picture should deteriorate later.

(4) *The cause of congenital hip-joint dislocation is presumed to lie in a laxity of the soft parts of the hip-joint and not in a primary dysplasia of the acetabulum*

We have come to the conclusion that congenital dislocation of the hip (CDH) is caused by laxity in the soft tissues of the hip-joint and not by a primary dysplasia of the joint. Andrén (1962) has dealt with this question in detail.

Conclusion

In Sweden the examination of the hip-joints has been included in the routine examination of neonates carried out in most of the obstetric departments. The principle that this examination be carried out and immediate treatment commenced is generally accepted in our country. Owing to the fact that most babies are delivered in the obstetric departments of our hospitals we should be able to pick up those with CDH immediately after birth. In order to get information about this Palmén and I started an investigation during 1963. All babies found at the obstetric departments to have clicking hip-joints are registered, and all cases of CDH brought to our orthopædic departments for treatment – immediately after birth or later – are also registered. We shall thus be able to get a more complete picture of the CDH situation in Sweden.

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Genetic Factors in Congenital Dislocation of the Hip

The incidence of congenital dislocation of the hip (CDH) in the United Kingdom, when no attempt is made to treat early cases, is about 0·7 per thousand live births (McKeown & Record 1960). The sex ratio is about one male to six females, so this implies an incidence of 1·2 per thousand female live births and 0·2 per thousand male live births. This incidence may be used as a yardstick of the success of early preventive treatment.

About 40% monozygotic co-twins of patients with CDH, but only 3% of dizygotic co-twins, are also affected (Idelberger 1951). This shows that both genetic and environmental factors must play a part in the ætiology of the condition. There are, as yet, no detailed family studies of CDH. It appears, however, that about 5% of sisters and 1% of brothers of index patients are also affected. This overall incidence is some forty times higher than that in the general population. Muller & Seddon's survey (1953) was especially valuable in providing data on incidence in the children of index patients and indicated that their risk is of the same order as that of sibs. This would exclude recessive inheritance, but is compatible with dominant or multifactorial inheritance.