DIFFICULTIES OF EARLY DIAGNOSIS AND TREATMENT OF CONGENITAL DISLOCATION OF THE HIP IN NORTHERN IRELAND*

JEAN WILLIAMSON, BELFAST, NORTHERN IRELAND

From the Orthopaedic Research Department, Musgrave Park Hospital, Belfast

Present efforts to eradicate congenital dislocation of the hip are based on tests for neonatal laxity of the joint. It is hoped that by arresting the disorder at this stage established dislocation may be avoided. The Ortolani and Barlow tests are simple enough but difficult to standardise and not always easy to perform. The screening of all babies in a widespread community therefore presents many problems in organisation and education before the difficulties of effective treatment arise.

ORGANISATION

In the area covered by the Northern Ireland Orthopaedic Service, which excludes Londonderry with its separate service, there are about 30,000 live births annually, 90 per cent of them in hospital. The maternity units are widely scattered and mothers stay for variable times after delivery. It is therefore not feasible for every new baby to be examined by an orthopaedic surgeon.

Responsibility for the first examination usually falls upon the obstetric and paediatric staff, or upon the general practitioner. Babies with suspicious signs are referred to an orthopaedic surgeon, either directly or to the first orthopaedic clinic in the area. In the peripheral clinics the surgeon may not see the baby for two or three weeks, by which time the signs may have changed. Often the orthopaedic sister attending the weekly clinic has to decide whether or not to splint the hips. The system has to be based on the delegation of responsibility, with acceptance both of early positive findings when the sign has disappeared and of negative findings when the babies are not referred.

Education—In order to teach the technique of examination for instability, a film of the Ortolani test is shown, with lectures to explain the difficulties that may be encountered. Positive signs are demonstrated whenever possible; sometimes students first feel the clunk of reduction transmitted through the examiner's hands in order to minimise handling of the unstable hip.

Difficulties with testing—Work in the Maternity Department has revealed several practical difficulties. The behaviour of the baby may affect the test. The importance of complete relaxation cannot be overstressed; it may be impossible to demonstrate a known dislocation if the baby is crying or kicking. Difficult breech deliveries may cause much bruising and a negative examination may not be valid.

The problem of tight adductors has been mentioned by Barlow (1968). In this series there was one case in which the signs were vague but the adductors tight. The deciding factor was a strong family history; splintage was applied but the hips were still dislocated at three months.

Errors in technique may also produce a false negative. Failure to steady the pelvis adequately can obscure the sign. Students are taught to examine babies on a firm flat surface. On one occasion a baby was examined in its cot, and although one hip felt rather lax, no definite instability was found until it was transferred to a hard surface, when dislocation was easily demonstrable. Some examiners circumduct the hip rather than just abducting it, and may miss the sign. Others fail to exert the slight backward pressure which is required and in fact exert slight traction on the thigh. Owen (1968) has suggested that the entire manoeuvre

* Based on a paper read to the British Orthopaedic Association in Belfast, April 1971.
could be conducted with the hip dislocated throughout; observations in the present study confirm this view. It is also suggested that if traction instead of pressure is applied abduction can be achieved with an unstable hip reduced.

There are, however, unexplained problems with the test. Experienced examiners may not confirm each other’s findings, or may not confirm their own findings a few hours later.

Eleven babies were referred for instability which was not confirmed at the first clinic, but subsequent examinations revealed instability or slight displacement requiring splintage in abduction. In some cases the sign has been unilateral but the displacement has proved later to be either bilateral or on the unsuspected side.

Whatever the reason for diagnostic failure, this lack of reliability of the test is an important problem when the scheme is being widened and decentralised.
MATERIAL

A retrospective study has been made of 783 children treated from birth and of 189 children treated after a later diagnosis during the period 1960 to 1970 inclusive. We have identified the birthplace of all congenital dislocation of the hip index patients since 1960. Figure 1 shows the number of children treated from birth. The incidence of unstable hips in the newborn exceeds the previous incidence of established dislocation. Figure 2 shows the number of children diagnosed by classical signs according to the year of birth, not the year of referral. The graph should show a rise in the rate of neonatal diagnosis (which it does) and ideally should show a fall to zero in the number of cases diagnosed late.

The apparent fall in the number of established cases from 1969 and 1970 is not a confirmed downward trend, because the peak incidence of referral of late cases is in the second year after birth, and children born in those years are appearing at the clinics only now. There is therefore a continuing hard core of established cases which were not found to be abnormal at birth.

COMMENT

The interpretation of the figures for these late referrals is open to doubt. They may be children whose hips were not examined (representing a failure of organisation), or the dislocation may have been missed (representing either a failure of education or actual failure of the test itself).

Table I Contrasting Statistics from Two Separate Maternity Units

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit A</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treated from birth</td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>14</td>
<td>14</td>
<td>37</td>
<td>1/777</td>
</tr>
<tr>
<td>Late diagnosis</td>
<td>1</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td><strong>Unit B</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Live births</td>
<td>593</td>
<td>680</td>
<td>660</td>
<td>769</td>
<td>767</td>
<td>831</td>
<td>885</td>
<td>915</td>
<td>6,100</td>
<td></td>
</tr>
<tr>
<td>Treated from birth</td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td>8</td>
<td>17</td>
<td>14</td>
<td></td>
<td>42</td>
<td>1/145</td>
</tr>
<tr>
<td>Late diagnosis</td>
<td></td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>12</td>
<td>1/508</td>
<td></td>
</tr>
</tbody>
</table>

Table I relates back to two maternity units in the province to illustrate how fallacies in the interpretation of results can occur. While it is true that not all babies born in these units have been re-examined in the orthopaedic department, nevertheless most of them are screened at the baby clinics and all children of school age have a medical examination. Therefore a dislocation diagnosed late in a child of any age would be referred to a local clinic and come on to our index. The only significant failure of follow-up is in children who emigrate before reaching school age.

In Unit A, out of almost 8,000 live births in 1962 and 1963, only one child presented later in an Ulster clinic with a dislocation. The low incidence is not attributable to protective splintage because no abnormal hips were identified at birth. Out of over 25,000 live births from 1962 to 1968 (when relatively small numbers were treated from birth) only three established dislocations presented late, or approximately one in 8,500. Within the past three months, however, three children born in this unit in 1969 have presented with dislocations, which suggests that the position is worse than before the scheme started.

In Unit B relatively more children were treated from birth. So far there has been no effect at all on the number of established cases, which is about nine times the rate for Unit A. However, five of these twelve children have strong family histories and one was a breech presentation. (Out of the six missed in Unit A, two were breech deliveries.)
This emphasises two points. First, that to have statistical validity, trends must be observed for a long time over a large population. A low local incidence may be for reasons quite unrelated to the activities of orthopaedic surgeons. Secondly, many of the cases missed by clinical testing belong to groups always considered highly at risk. Simple arithmetic from almost any series shows that most so-called dislocations in the newborn reduce themselves. The ones which persist must have reached some point of no return beyond which spontaneous reduction does not occur. If by the time of birth the dislocation and its secondary changes are already relatively advanced, it may be more difficult to reduce by the Ortolani manoeuvre and the test may therefore be negative. These which are difficult to reduce manually in the test would be unlikely to reduce themselves. The figures certainly suggest that this is what is happening. The test is picking out more lax hips of the type at low risk and missing the very ones which are most likely to persist if untreated. This is why the number of established cases remains disappointingly high.

In this respect the findings of a prospective study at one maternity unit, covering two years from February 1969, are of interest. Two thousand three hundred and forty-one babies were examined and twenty-eight hips, all tested by an independent examiner, were treated. Two children born in the Unit during this period have presented with dislocation at thirteen and fourteen months. Both had undergone examination by the hospital staff but not by an orthopaedic surgeon because of early discharge home.

This pattern is reflected in the figures for the whole area. As experience has increased, many more newborn babies are being referred to the orthopaedic clinics with unstable hips, but toddlers with established dislocations continue to be found.

![Graph showing the number of cases of established dislocation presenting each year from 1960 to 1970.]

**TREATMENT**

Difficulty can also occur in management. At first a removable polythene splint was used over the ordinary nappy, but this did not hold the hips continuously reduced in all cases. More recently the Barlow cruciform splint has been used. Some babies seem to be able to bend this by kicking. Earlier in the scheme splintage was sometimes discontinued when clinical stability had been attained, but displacements revealed later by radiographs discouraged this and now splintage is continued until a film is taken at three months.

In nineteen cases simple splintage failed to produce a normal hip. Six children required prolonged splintage in abduction; in all six progress is satisfactory.

Thirteen children had persistent displacement. Eight had routine conservative treatment with epiphysitis in three cases. Five children required surgery (three open reduction; one...
open reduction followed by derotation osteotomy; and one derotation osteotomy alone); there were four good results and one poor.

In the assessment of the results these thirteen cases of persistent dislocation must be added to the missed cases to indicate the true total of established dislocations.

DISCUSSION

In most cases of neonatal instability of the hip the course under splintage is uneventful, with stability rapidly achieved and normal radiographs later. Resistant cases (which in this series were about 2-4 per cent of those treated) must fall into a highly vulnerable group of which the natural history is quite different. With more of these for study it might be possible to detect them early.

Finally, the scheme must be evaluated by its effect on incidence. The success or failure of today's efforts will become apparent in 1972 or 1973. The disturbing situation at present is shown by the number of children still being referred late. Figure 3 shows the number of established cases presenting each year in the decade. There has been no dramatic improvement.

SUMMARY

1. In Northern Ireland a campaign to eradicate congenital dislocation of the hip by neonatal demonstration of abnormal laxity and early splintage has been reviewed. The number of live births in the area covered is approximately 30,000 per annum.
2. The results to date suggest that the problem has been greatly over-simplified. The number of established dislocations has not fallen appreciably.
3. Failures have occurred both in early diagnosis and in early treatment.
4. To help close the diagnostic net all children should be screened again during the first year. Infants born by breech presentation and infants with a family history of dislocation should have radiographs taken in the early months, even if clinical tests are negative.
5. With regard to neonatal treatment, early splintage has failed to prevent established dislocation in about 2-4 per cent of the hips so treated. How to detect such resistant cases is an important problem.

This study was conducted with a grant from the Northern Ireland Hospitals Authority.

My thanks are due to the orthopaedic surgeons in Musgrave Park Hospital, Belfast, and Altnagelvin Hospital, Londonderry, for permission to study cases, to the Hospital Management Committee and staff of the Ulster Hospital, Dundonald, for making possible the two-year survey of newborn babies, and to the staff of the Northern Ireland Orthopaedic Service for their help in the follow-up.

REFERENCES