TREATMENT IN LEGG-CALVÉ-PERTHES' DISEASE

A Comparison of In-patient and Out-patient Methods

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We have considered the hypothesis that in Perthes' disease prolonged immobilisation of the child and rest to the affected joint favourably influence the ultimate radiological appearance of the hip. An analysis of the clinical material that we now present fails to support this concept.

METHOD AND MATERIAL

We have compared the results of treatment at the Hospital for Sick Children with those obtained at the Royal National Orthopaedic Hospital. At the Children's Hospital out-patient treatment with a sling (Snyder 1947) (Fig. 1) was the routine method ("out-patient" group), whereas at the Orthopaedic Hospital traction in bed followed by walking in a weight-relieving caliper was the rule ("in-patient" group).

In assessing the results of treatment note must be taken of factors known to affect the prognosis. Of these, the age at onset of the disease and the sex of the patient (Evans 1958) are important. Involvement of both hips precludes treatment by a Snyder sling and crutches.
We have consequently excluded from our review all girls, and patients of either sex with both hips affected. Since measures designed to protect the diseased femoral head from pressure have been considered valuable, it seemed important to distinguish between the patients to whom this protection could be applied early and those who attended at a later stage. We have accordingly classified our cases into ages and stages of the disease at the time of diagnosis.

Each age group spans one year. The youngest (age three) covers the period two years and six months to three years and five months; the oldest (age eight) covers the period seven years and six months to eight years and five months. The stage of the disease was designated early or late. Late cases included those showing increased homogeneous density and obvious flattening of the epiphysis, and those with fragmentation, however slight. The remainder were classified as early. When the category was doubtful we were influenced by the duration of symptoms and when possible by a lateral radiograph.

From thirty-four out-patients we selected twenty-eight boys with unilateral disease. After subdivision by age and stage each radiograph was matched, hip by hip, with a radiograph of a boy of similar age and stage treated as an in-patient. The in-patient group numbered over 200, and this allowed us in most cases to select a radiograph closely comparable with that of each out-patient. We were, however, unable to pair four cases with sufficient accuracy for inclusion. This reduced the comparable groups to twenty-four, some of the features of which are tabulated above (Table I). Figures 4 to 6 show examples of such matched radiographs.

Figure 2 shows the distribution of patients in ages and stages and applies to both series.

**RESULTS**

A comparison was made of the most recent radiographs of each of the paired cases. Thus, as the pairs were similar in age and in the radiographic appearances of their hips at the time when treatment started, any differences revealed by the late radiographs might well be attributable to the treatment given.
The radiographic results were assessed as good, bad and intermediate. The results classified as good showed a femoral head of almost normal contour, congruous with the acetabulum and with no significant shortening of the femoral neck. A bad result infers a flattened head with lack of congruity and often subluxation or a shortened femoral neck. Radiographs showing some good and some bad features are classed as presenting intermediate results.

The results of treatment in both series are shown in Figure 3 and summarised in Table II. There is no significant difference between the two. Table III summarises the results of both methods of treatment in those cases in which treatment was begun early or late in the evolution of the disease.
FIG. 4

Top—Matched radiographs at time of diagnosis. Age three years. Stage—late. Bottom—Later radiographs of the same patients. Ages nine and ten years. Results—good. (In-patient on left; out-patient on right.)
**Fig. 5**

*Top*—Matched radiographs at time of diagnosis. Age six years. Stage—early. *Bottom*—Later radiographs of the same patients. Ages nine and twelve years. Results—intermediate. (In-patient on left; out-patient on right.)
FIG. 6

Top—Matched radiographs at time of diagnosis. Age eight years. Stage—late. Bottom—Later radiographs of the same patients. Ages fifteen and thirteen years. Results—bad. (In-patient on left; out-patient on right.)
of the disease. The greater number of bad results in the patients presenting late is accounted for by the higher incidence of late cases in the six to eight year olds compared with the three to five.

**TABLE II**

**RESULTS OF TREATMENT**

<table>
<thead>
<tr>
<th>Method of treatment</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Good</td>
</tr>
<tr>
<td>In-patient</td>
<td>15</td>
</tr>
<tr>
<td>Out-patient</td>
<td>14</td>
</tr>
</tbody>
</table>

This analysis indicates that enforced protection of the femoral head in recumbency neither favours a good result in the early cases nor improves the prognosis in the late cases when compared with a method of treatment less rigorous in every respect.

**TABLE III**

**RESULTS OF TREATMENT ACCORDING TO STAGE OF DISEASE WHEN TREATMENT BEGAN**

<table>
<thead>
<tr>
<th>Stage of disease</th>
<th>Method of treatment</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Good</td>
</tr>
<tr>
<td>Early</td>
<td>In-patient</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Out-patient</td>
<td>8</td>
</tr>
<tr>
<td>Late</td>
<td>In-patient</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Out-patient</td>
<td>6</td>
</tr>
</tbody>
</table>

It may be suggested that an average period of ten months' immobilisation is too short for the benefits of this method to become apparent. Accordingly we would emphasise that six of the twenty-four patients were in hospital for periods of eighteen months to two years.

**TABLE IV**

**COMPARISON OF MEAN EPhipyal INDICES OF NORMAL AND AFFECTED HIPS IN BOYS TREATED AS IN-PATIENTS AND OUT-PATIENTS**

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Normal hip</th>
<th>Affected hip</th>
<th>Normal hip</th>
<th>Affected hip</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>At onset of treatment</td>
<td></td>
<td>At follow-up</td>
<td></td>
</tr>
<tr>
<td>3–6</td>
<td>54</td>
<td>38</td>
<td>52</td>
<td>38</td>
</tr>
<tr>
<td>7–8</td>
<td>40</td>
<td>25</td>
<td>40</td>
<td>27</td>
</tr>
<tr>
<td>over 7</td>
<td>41</td>
<td>28</td>
<td>41</td>
<td>29</td>
</tr>
</tbody>
</table>

Of these, one hip was better, one worse and four were identical with their out-patient counterparts.

It seemed prudent, however, to submit our selection and findings to further analysis.
Accordingly we have assessed the epiphysial indices (Eyre-Brook 1936) for the affected and opposite normal hips in both the early and late radiographs (Table IV). These mean indices support our belief that our cases are comparable in both selection and outcome.

It must be emphasised that this is purely a comparative radiographic study of end-results, and symptoms and signs have not been included in our final assessment. Evans (1958) has, however, shown in a far larger series, which includes some of these patients, that clinical features closely parallel the radiographic.

CONCLUSIONS

1. There is no significant difference in the final radiographic appearance of the femoral head between patients treated in hospital or as out-patients.
2. In view of this, from both a social and economic standpoint, out-patient treatment appears to be the method of choice.

Eighteen patients of the out-patient group were treated by the late Mr Eric I. Lloyd at the Hospital for Sick Children; five were treated by Mr Denis Browne and one by Mr G. H. Macnab at the same hospital. We wish to record our thanks to them and to Mr J. A. Cholmeley, Mr P. H. Newman, Mr K. I. Nissen, Mr R. Y. Paton, Mr H. J. Seddon and Mr David Trevor of the Royal National Orthopaedic Hospital for permission to review their cases.

We also record our thanks to Mr Derek Martin for the illustration of a Snyder sling.

REFERENCES

