PERTHES' DISEASE

A Study of Thirty-four Hips Observed for Thirty Years

A. H. C. RATLIFF, BRISTOL, ENGLAND

In 1953 I reviewed fifty cases of Perthes' disease from childhood to adult life. The follow-up was eleven to thirty years (Ratliff 1956). This paper reports the present state of the patients. Attention is given to possible clinical and radiological deterioration in the last twelve years.

REVIEW OF THIRTY-FOUR AFFECTED HIPS

The material for this study is based on thirty-four hips observed for an average of thirty years. The shortest period of follow-up was twenty-five years and the longest forty years. Most of the patients studied had been treated at the Biddulph Grange Orthopaedic Hospital, a few at the Robert Jones and Agnes Hunt Orthopaedic Hospital and the Princess Margaret Rose Hospital, Edinburgh. In all cases details of treatment and radiographs in childhood were available and the patients were seen and radiographed both in early adult life in 1953 and again in 1965. Every endeavour was made to trace all the patients seen in 1953, but for various reasons this was not possible. Most patients were seen by me but in a few cases I am grateful to colleagues for examining these patients and reporting their present state. Twenty-five of the hips had been treated by immobilisation on frames; one had been immobilised in a hip spica. I have not attempted to differentiate between the result of these methods. The average period of immobilisation was eighteen months (shortest six months, longest twenty-four months). Eight patients received no treatment during the active phase of the disease, though a few of these received some treatment too late, when the femoral head was partly re-formed. These are classified together as "untreated" cases.

TABLE I
A REVIEW OF THIRTY-FOUR HIPS IN THIRTY PATIENTS
(Twenty-two men, eight women)

Ages of patients	29-52 years (average 38)	
Length of follow-up	25-40 years (average 30)	
Good hips	(18-20 points)	15
Fair hips	(15-17 points)	11
Poor or very poor hips	(14 points or less)	8
Details:		
Pain	None or slight aches	30
Activity	Normal	29
Movement	Full or terminal limitation	20
Radiographs	Normal or slightly flattened	14

ASSESSMENT OF RESULTS

As in the previous study I was impressed that many patients had few complaints and their hips showed good movement despite varying degrees of deformity. The classification previously described, and based on that used by Muller and Seddon (1953), has again been employed;

every patient was given a maximum of five points each for pain, activity, movement and radiographic appearances. These will not be detailed again but it will be recalled that a normal joint would be described as P5, A5, M5 and X5, thus scoring a total of twenty points. Each joint examined was allotted marks in this way and hence they were finally classified into three groups: good—eighteen points or over; fair—seventeen to fifteen points; poor or very poor—fourteen points or less.

RESULTS

The general results are illustrated in Table I. Two general conclusions are seen from the examination of these results. Firstly, in cases of Perthes' disease followed up for an average of thirty years, rather more than one-third were good, the same number were fair and about

FIG. 1

FIG. 2

FIG. 3

FIG. 4

Illustrating a good result. Figure 1—Photograph when aged 8 years, showing marked limitation of abduction. Figure 2—Radiograph on admission showing Perthes' disease with mild flattening and no fragmentation. Figure 3—Radiograph after sixteen months frame fixation showing good re-formation of the upper femoral epiphysis. Figure 4—Radiographs when 35 years showing an almost normal left hip. There were no symptoms and movement was full.

one-quarter were poor. With rare exceptions the clinical and radiographic condition of these hips in 1965 was not changed from that of 1953. Secondly, four-fifths of the patients were fully active and free from pain but only two-fifths had good hips radiologically. I noted with some surprise the absence of pain and the presence of normal activity in most of these

FIG. 5

FIG. 6

FIG. 7

FIG. 8

Illustrating a fair result. Figure 5—Photograph when aged 9 years, showing restricted abduction of the right hip. Figure 6—Radiograph on admission showing marked flattening and fragmentation of the upper femoral epiphysis. Figure 7—Radiograph after frame fixation for seven months. Some re-formation has occurred but the epiphysis is still flattened. Figure 8—Radiograph when 39 years. There was normal activity but there were occasional attacks of pain.

FIG. 9

FIG. 10

FIG. 11

Illustrating a poor result. Figure 9—Radiograph on admission aged 5½ years. Figure 10—Radiograph after twenty-three months of frame fixation, showing marked flattening. The epiphysis is incompletely contained. Figure 11—Radiograph when 33 years, showing a flattened head, incompletely contained and with a narrow joint space. There was reduced activity and some aching in the hip.

patients. Examples illustrating a good result are shown in Figures 1 to 4, a fair result in Figures 5 to 8, and a poor result in Figures 9 to 11.

THE VALUE OF TREATMENT

A comparison of the results of treated and untreated cases is shown in Table II. Only one out of eight untreated cases gave a good result. I am conscious of the small numbers quoted here but no other report can yet be found of the long-term observation of untreated cases. These figures would suggest that treatment is worth while.

TABLE II
THE VALUE OF TREATMENT
(Twenty-six hips treated; eight untreated)

Result	Treated	Untreated
Good	14	1
Fair	7	4
Poor and very poor	5	3

COMPARISON WITH CONDITION TWELVE YEARS AGO

Special attention was given in this study to the possibility of alteration in the condition of the hip in the last twelve years. Six patients showed evidence of clinical deterioration in the state of the hip. Four of these reported a slight increase of pain; this pain was intermittent and did not prevent work or recreation. In three patients there was evidence of some reduction of movement of the hip. A change in the radiological appearances of the hip occurred in only two patients and one of these is illustrated (Figs. 12 to 15). Symptoms had been sufficiently marked in only two patients to demand hospital consultation in the last twelve years. In one of these patients pain was severe and arthrodesis was performed in 1954; in the other, pain was mild and no treatment was advised.

Thus, deterioration in the condition of the hip joint was rare up to forty years of age; increase of symptoms was infrequent and not severe enough, except in two cases, to merit orthopaedic consultation. This absence of deterioration in the condition of these hips is illustrated in Figures 16 and 17.

DISCUSSION

The factors influencing the prognosis of Perthes' disease have been discussed by many others (Møller 1926, Eyre-Brook 1936, Ratliff 1956, Evans 1958, Danielsson and Hernborg 1965). Though it is appreciated that such factors as the age at onset and severity of the disease influence the immediate result in childhood, nevertheless this study has shown that it is not possible to predict accurately the late result of this condition in adult life. The nature of growth of the head and neck of the femur with remodelling could not be forecast and occasionally produced surprising results. An example of an "unexpected" good result is shown in Figures 18 and 19. In this case, as the disease was severe and developed at a relatively late age for this condition, the late result might have been expected to be poor. I was often surprised to note in this study the good clinical condition that had been maintained by so many patients.

I have traced only one paper discussing a long follow-up of cases of Perthes' disease (Danielsson and Hernborg 1965) when patients were examined clinically and radiologically

FIG. 12

FIG. 13

FIG. 14

FIG. 15

Illustrating late radiological deterioration. Figure 12—Radiograph of a girl of 10 years on admission, showing increased density of the upper femoral epiphysis with a little flattening. Figure 13—Radiograph after eighteen months frame fixation showing a fairly well re-formed but still flattened head. Figure 14—Radiograph when 26 years. Normal activity and no pain. Figure 15—Radiograph when 38 years showing increase of sclerosis and the loss of joint space. The patient still has normal activity and only an ache in the thigh in damp weather.

FIG. 16

FIG. 17

Illustrating the absence of deterioration between 1953 and 1964. Figure 16—Radiograph of the right hip of a man of 31 years in 1953 who had Perthes' disease when he was 8 years. The head is flattened and deformed and the neck is short. Figure 17—Radiograph when 42 years in 1964. There is no change in the radiological appearance. The man works as a lorry driver; he has no symptoms except pain in the groin in cold weather.

FIG. 18

FIG. 19

Illustrating an unexpected good result. Figure 18—Radiograph on admission when 9 years showing severe flattening and fragmentation of the upper femoral epiphysis, subluxation of the hip and a cyst in the metaphysis. Treated by frame fixation for fourteen months. Figure 19—Radiograph when 42 years. The patient worked as a labourer and had no pain and full movement.

thirty-three years after the onset. "In twenty-eight patients the hips were painless. Structural changes and/or narrowing of the joint space were noted in seventeen cases." There was a close similarity between the results of Danielsson and Hernborg and those discussed in this paper.

SUMMARY AND CONCLUSIONS

1. Thirty-four cases of Perthes' disease followed into adult life were reviewed twenty-five to forty years (average thirty years) after diagnosis.
2. Rather more than one-third of the patients developed hips which were good, an equal number were considered fair and about one-quarter were poor.
3. Four out of five patients were fully active and free from pain but only two out of five had hips which were radiologically good.
4. Clinical and/or radiological deterioration had seldom occurred in the last twelve years.
5. A good result in childhood is likely to be maintained with no pain and good function up to the age of forty years and perhaps longer.

I am grateful to Mr D. LL. Griffiths and Professor J. I. P. James for allowing me to examine these patients in their departments.

REFERENCES

- DANIELSSON, L. G., and HERNBORG, J. (1965): Late Results of Perthes' Disease. *Acta Orthopaedica Scandinavica*, **36**, 70.
- EVANS, D. L. (1958): Legg-Calvé-Perthes' Disease. *Journal of Bone and Joint Surgery*, **40-B**, 168.
- EYRE-BROOK, A. L. (1936): Osteochondritis Deformans Coxae Juvenilis or Perthes' Disease: the Results of Treatment by Traction in Recumbency. *British Journal of Surgery*, **24**, 166.
- MØLLER, P. F. (1926): The Clinical Observations after Healing of Calvé-Perthes' Disease Compared with the Final Deformities Left by that Disease, and the Bearing of those Final Deformities on the Ultimate Prognosis. *Acta Radiologica*, **5**, 1.
- MULLER, G. M., and SEDDON, H. J. (1953): Late Results of Treatment of Congenital Dislocation of the Hip. *Journal of Bone and Joint Surgery*, **35-B**, 342.
- RATLIFF, A. H. C. (1956): Pseudocoxalgia. *Journal of Bone and Joint Surgery*, **38-B**, 498.