DISCITIS

An Inflammation Affecting the Intervertebral Discs in Children

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The purpose of this article is to describe a condition in children characterised by narrowing of an intervertebral disc. The late Eric Price of Melbourne coined the word "discitis" to describe the disorder, and this term is retained because the essential feature is inflammation affecting a disc with little or no evidence of primary bone involvement. The clinical features and course of the disease in the cases described here followed a constant pattern. In brief the illness is characterised by vague back or leg pain, a stiff back, mild toxaemia, narrowing of a disc space radiologically and rapid resolution of symptoms and signs when the child is rested.

Ghormley, Bickel and Dickson (1940) described twenty patients with narrowing of an intervertebral disc. In their series the patients were more severely ill than those described below, and they were older. Saenger (1950), Bremner and Neligan (1953), Dupont and Andersen (1956), Mathews, Wiltse and Karbelnig (1957), Doyle (1960) and Jamison, Heimlich, Miethke and O'Loughlin (1961) have built up a picture of the clinical condition in children. The series presented below describes the clinical picture and the progressive changes which may occur over the succeeding years.

MATERIAL

In the last sixteen years thirty-five children (twenty-four girls and eleven boys) have been treated for discitis at the Royal Children's Hospital, Melbourne, and all but three of these have been followed for more than two years after discharge from hospital (Table I). Twenty-seven children have recently been reviewed personally, the average time to review being four years and four months. Two others have not been included in this review: one developed this clinical syndrome after lumbar puncture, and another child with Perthes' disease was found to have asymptomatic narrowing of the lumbar 3–4 interspace. It is interesting that one child who previously suffered from discitis has since developed Perthes' disease.

CLINICAL FEATURES

The youngest child was aged ten months when first seen; the oldest was aged thirteen and a half years; the average age was seven years and two months. In two children more than one intervertebral disc was affected. As shown in Table II the lumbar spine was involved in 74 per cent and the cervical spine was affected in only one child.
The commonest symptoms were backache and vague pains in the buttock, thigh or knee (Table III). Two children developed headache and vomiting at the onset. One presented with abdominal pain and one with a painless limp. One patient had no symptoms, but a kyphos was noted during routine examination. The girl with the cervical spine affected gave a history of a painful stiff neck and shoulder pain of sudden onset.

Case 1—A girl aged sixteen months presented with a history of irritability and refusal to stand for four days. The first radiograph (Fig. 1) showed no abnormality. Three weeks later (Fig. 2) there was definite narrowing of the L4-5 disc. Figures 3 to 5 show progressive irregularity and then sclerosis of the adjacent vertebrae at four months, one year and four years from the onset of the condition.

In the children who were too young to describe symptoms the mothers stated that the children would not sit up or would refuse to walk and appeared to have sore legs. The illness was preceded by fever or vague ill health in four children. One child had had recurrent tonsillitis, one had been investigated for pain in the back and weakness of leg muscles eighteen months previously, five had had slight injuries, and two had recently suffered from gastroenteritis. Many of these children had been extensively investigated before a diagnosis was
made and were often referred to the orthopaedic department from the medical wards. The average time from onset of symptoms to diagnosis was nine weeks.

The common physical sign in lumbar discitis was a stiff back. There might also be loss of the lumbar lordosis or a prominent lordosis (Table IV). There might be tenderness at the site of the lesion or a prominent spinous process. Koenig’s sign was positive in two children and one had severe hamstring spasm. Eight children had no abnormal physical signs. Fourteen children had pyrexia in the early stage, but generally the temperature was not above 100 degrees Fahrenheit and the children were not severely ill.

RADIOGRAPHIC APPEARANCES

At the onset radiographs may be normal (Fig. 1). The earliest change is narrowing of the disc space and this may become evident in as short a time as three weeks (Fig. 2). Further narrowing of the disc takes place over a period of months (Figs. 3 to 5). There may be erosion of the adjacent vertebrae with fluffy ill-defined margins to these erosions or merely irregularity of the vertebral margins which, in either case, become sclerosed later. Tomographs may reveal much more bone involvement than is shown by plain radiographs (Figs. 6 and 7).
Progressive narrowing of the disc occurred in 60 per cent of the children. Sometimes there was ossification at the periphery of the disc (Fig. 8) and in three spines there was indubitable bony fusion at the time of review (Fig. 9). One man aged twenty-eight showed widespread disc degeneration fifteen years after the illness (Fig. 10).

When the disc did not show progressive narrowing after the first few months it either retained a constant amount of narrowing or showed signs of reconstitution (Figs. 11 and 12). There was often very little residual disc narrowing (Fig. 13).

The progress of the condition in the cervical spine is shown in Figures 14 to 16.

OTHER SPECIAL INVESTIGATIONS

The blood sedimentation rate was raised in seventeen children; the highest recorded was 58 millimetres in the first hour. The white cell count was raised in three children and the anti-streptolysin titre in two. Serum protein estimation, Wassermann and Kahn reactions, gonococcal complement fixation test and Rose’s test were negative in the few children on whom they were done.

Initially, the possibility of tuberculosis had to be considered, but in all the children the Mantoux test was negative and the short course of the condition was quite unlike that of tuberculosis of the spine.

The radiological features sometimes resembled those of typhoid fever and brucellosis, but these conditions were excluded by routine agglutination tests.

TREATMENT

The principles of treatment are to rest the spine in recumbency until there is no pain or limitation of movement, until the blood sedimentation rate is normal and until radiographs indicate that bony erosion is not progressing (indeed we prefer to see some sclerosis occurring).

The children were rested on a plaster bed or Bradford frame for two months and then reviewed. If the above criteria were not satisfied, immobilisation was continued for a further period. Experience has shown that prolonged recumbency is essential, and when this principle has been violated re-admission has always been necessary. When the criteria were satisfied the children were generally mobilised and allowed home without further treatment. Several were given a brace for a short period. The child with discitis of the cervical spine was treated by head traction for three months.

Antibiotics were reserved for children with pyrexia and thirteen children were given courses of varying length.

COURSE AND PROGNOSIS

We had an opportunity to learn something of the course of the condition when
Case 4—A boy presented with low back pain and a stiff back at the age of thirteen years. Radiographs at that time showed narrowing of the L.4-5 disc. Subsequently similar changes occurred at the L.5-S.1 level. The antero-posterior and lateral radiographs show narrowing at the L.3-4 and fusion at the L.4-5 and L.5-S.1 levels six years after the onset.

Case 5—Antero-posterior and lateral radiographs of a man aged twenty-eight years who suffered discitis at the L.3-4 level fifteen years previously. There is widespread disc degeneration and he suffers from backache.
untreated, because several children had suffered symptoms for up to eighteen months before diagnosis and treatment. In these, the symptoms improved with rest, but recurred because rest was not sufficiently prolonged. As soon as the diagnosis was made and continuous rest instituted the symptoms quickly subsided. This suggests that the natural course of the condition is for pain to persist until prolonged rest is enforced, irrespective of the stage that the pathological process has reached.

![Fig. 11](image1)

Case 6—This girl was aged six years and eight months when first radiographed (Fig. 11). Her only symptoms were headache and general malaise with stiffness of the lumbar spine. Radiographs sixteen months later (Fig. 12) showed remarkable reconstitution of the L.1-2 disc.

![Fig. 12](image2)

![Fig. 13](image3)

Case 2—Antero-posterior and lateral views of the girl whose original radiographs are shown in Figures 6 and 7. There is only very slight residual narrowing of the affected disc eight years later.

Suppuration occurred in two children. In one, infection threatened to point posteriorly, but resolved with rest and a course of tetracycline. The other child developed an abscess in the left iliac fossa six weeks after her discharge from hospital, after twelve months' rest on a plaster bed. The abscess was explored and could be followed down to the vertebral column. The pus was sterile.
Case 7—This girl was aged eleven years when she presented with a painful stiff neck. Radiographs showed narrowing of the C.5–6 disc (Fig. 14). Three months later there was progressive narrowing (Fig. 15) and two years later there was fusion of the adjacent vertebrae (Fig. 16).

The physical signs settle down with rest, and few of the patients had abnormal signs in the back at the time of review. One had a palpable kyphos, one showed limitation of straight leg raising and one had limitation of movement of the lumbar spine—the patient with involvement at several levels whose radiographs are shown in Figure 9. This patient and four others had some backache at the time of review. These were the older patients, aged eighteen to twenty-eight years at the time they were reviewed. It may be that other patients will develop backache in time.

DISCUSSION

The etiology of discitis remains unknown. The radiological features and the raised temperature and blood sedimentation rate suggest that it is an infective process. Cases have been reported in which the staphylococcus or bacillus coli have been cultured and it seems possible that this might be a coccal infection. There is a range of conditions from low-grade infection to frank pyogenic osteomyelitis of the spine, and discitis may represent the subacute end of this range. Many of these children had been given antibiotics for one reason or another before the diagnosis was made and it is possible that the antibiotic modified the condition.

In the State of Victoria (Australia) there is a high incidence of non-specific infections of the joints of the lower limb and it is possible that discitis represents the same condition affecting the spine. These non-specific infections are often thought to be viral because no organism can be demonstrated and because they are non-suppurative. In any case because the intervertebral disc is avascular the primary infection must be in the vertebra close to the epiphysis.

The infection is not tuberculous, because the Mantoux test is always negative and the clinical and radiological course is not that of spinal tuberculosis.

Whatever the etiology, we have come to recognise this condition as a clinical syndrome running a fairly constant course and capable of cure by rest. The chief point in the diagnosis of discitis is to remember that the condition commonly presents with symptoms unrelated to the back and the diagnosis will remain obscure unless the back is examined.
SUMMARY AND CONCLUSIONS

1. Thirty-five children suffering from a mild illness with narrowing of an intervertebral disc have been studied.
2. Backache was the presenting symptom in only a small proportion of children, vague aching in the legs being almost as common at the onset.
3. Stiffness of the affected part of the spine is often present, but there may be no abnormal signs in the back.
4. Radiographs reveal a narrowed disc space with adjacent bony changes. There is usually progressive narrowing of the disc space which may go on to fusion of the affected vertebrae. Less commonly there is reconstitution of the affected disc.
5. The symptoms and signs quickly subside with immobilisation in recumbency and this treatment should be continued until the blood sedimentation rate returns to normal.
6. Adults who have suffered from discitis in childhood are probably more prone to develop backache.
7. The etiology remains uncertain.

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REFERENCES