EARLY DRAINAGE OF PARASPINAL TUBERCULOUS ABSCESSES
IN CHILDREN

A Preliminary Report

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The dreadful results of tuberculosis of the thoracic spine in children are too well known all over the world. Even if the disease becomes arrested the child's life remains threatened by the thoracic deformity and by the remaining large, partly calcified abscess. Apart from the risk of recrudescence of activity of the disease, the mechanical effects of the deformity threaten the function of the heart, the lungs and the spinal cord.

Chemotherapy and earlier diagnosis have improved the outlook, but something more than these is needed if an abscess of any size is present when the child is first seen. It is, however, still undecided how much more should be done. Stevenson’s (1954) question as to how best we may apply modern combined treatment to a child of three with a globular abscess remains unanswered. This paper will try to give an answer, even though that answer is to be regarded as preliminary and perhaps only applicable to Chinese children.

The literature of combined orthopaedic, chemotherapeutic and operative treatment in children is surprisingly scanty. Wilkinson (1954) mentioned five children with spinal tuberculosis treated by chemotherapy and curettage of the vertebral bodies, but he did not state the area of the spine that was affected. He had four successes and one failure; the average duration of treatment was twenty-six months. Dobson’s (1956) series included fifteen patients, adults and children, in whom costo-transversectomy was performed for thoracic Pott’s disease with tense perispinal abscesses. His results were good and “in only three cases have sinuses followed, all in adults with extensive generalised tuberculosis.” Hodgson and Stock (1956) gave a preliminary report of their radical operation for thoracic disease and for Pott’s paraplegia in forty-eight patients, of whom seven presented early thoracic disease while under the age of twelve. Roaf (1956) reported the successful treatment of three Indian infants under the age of two. All three had paraplegia, and all recovered movement after costo-transversectomy and curettage of the skeletal focus. Griffiths, Seddon and Roaf (1956) described twenty-eight cases of costo-transversectomy for paraplegia, but only five of these operations were performed for early disease in children under twelve. In three of these five the paraplegia made a rapid recovery, but there was later relapse of the paralysis in two. The literature is thus not only scanty, but it is largely concerned with paraplegia and with recovery from paralysis rather than with cure of the bony focus.

This scarcity of reference to early operative treatment of the disease in children is a reflection of the recent decline in its incidence in Western Europe and in North America. In Singapore, active thoracic spinal tuberculosis is still common enough to present a large therapeutic problem, but the reluctance of Chinese parents to bring their children to hospital means that we have all too little opportunity of studying early cases. Too many patients with early disease are taken to unqualified practitioners (the “sinseh”).

A SERIES OF FOURTEEN CASES

A case was considered “early” if it showed 1) a short history, less than a year, and 2) an abscess shadow in the radiograph which had sharp borders; these shadows were dense and fusiform or globular in all cases.

I have collected fourteen such cases in Chinese children under twelve years old in the five years 1952–56. Costo-transversectomy or antero-lateral decompression was performed forty-one times in children during this time, but in only fourteen could the term “early case” be applied. Table I gives details of these fourteen.
Their ages ranged from two to twelve years (Fig. 1). Three of the four older children had tuberculosis disease elsewhere as well as in the thoracic spine.

In all fourteen children chemotherapy was given according to the routine advocated by Wilkinson (1954). The dosage is shown in Table II. Chemotherapy was started immediately after admission to hospital so that operation should be performed under established antibiotic cover (Orell 1956).

Costo-transversectomy was performed as soon as possible after the patients had become accustomed to their anterior and posterior plaster shells. In four cases, however, other lesions demanded urgent treatment, and thus delayed operation for the spinal lesion.

THE OPERATION

The main purpose of the operation is to release pus, which in these early cases may gush out under considerable pressure. Necrotic matter has been removed only when it has presented spontaneously. Curettage has not been performed.
This purpose can be fulfilled by means of a straightforward costo-transversectomy. After removal of the pus and of any presenting debris the cavity is irrigated with normal saline and hydrogen peroxide, a gramme of streptomycin powder is inserted, and the wound is closed forthwith.

Our patients have stayed in hospital for an average of about a year after operation. It is hoped that this time will be reduced in the future, but in Singapore the length of stay in hospital is largely influenced by home conditions and other social factors. In some cases the time spent in hospital was also lengthened by the treatment necessary for disease in other parts of the body.

### RESULTS

**Abscess**—The abscess disappeared completely in thirteen cases. In one (Case 7) there is still a narrow "strip" visible in the radiograph, but in this case the operation had to be postponed for six months because of the state of the lungs.

**Vertebral changes**—Bony fusion of the affected vertebrae occurred spontaneously within six to eight months in four cases.
Erythrocyte sedimentation rate—A typical response of the erythrocyte sedimentation rate is shown in Figures 2 and 3. Rest and chemotherapy produce an immediate fall in the rate; operation accelerates it again, but is speedily followed by a fall to normal. The same tendencies are shown even in cases complicated by active lung disease.
Paraplegia—Paraplegia was present in eight of the patients on admission to hospital. This is a high incidence, explained by the fact that it was only the children’s inability to walk which persuaded the parents to bring them to hospital. In six cases the paraplegia disappeared completely after costo-transversectomy. In one child (Case 7) there is still some spasticity in one leg, but in this child the operation had to be delayed for six months because of pleurisy, and the spinal lesion amounted to almost total destruction of one vertebral body with subluxation of the one above. In the eighth child (Case 9) the paralysis made no response to costo-transversectomy, but was relieved after laminectomy four months later.

Paraplegia from lesions such as were present in those two cases (Fig. 4) appears to call for a more radical approach, and, since such spines may be unstable, the type of operation introduced by Hodgson and Stock (1956) is probably the best.

**DISCUSSION**

It seems to be accepted that the spread of the tuberculous infection in the form called spondylitis anterior is direct (Dobson 1956) and due to several factors. The tension in the abscess is itself one of these; it can be demonstrated at operation, and it appears to cause pressure necrosis in the same way as an aortic aneurysm. The pneu-modynamic effect of respiration may be similar in its action (Ménard 1900, Capener 1954). Loss of blood supply from thrombosis or endarteritis of the vessels serving the vertebral bodies may make matters worse, as may their occlusion or destruction by large dissecting abscesses (Cleveland and Bosworth 1942). All these factors may have their effects lessened by early release of the abscess, the earlier the better. The results obtained in our cases support this view.

Further, if destruction in the anterior parts of adjacent vertebrae is caused mainly or partly by pressure from the abscess combined with the pneu-modynamic effect of respiration, regeneration of the bodies should be expected if drainage is performed before any real collapse has occurred. I believe that this has been demonstrated in several of our cases (Cases 2, 8, 9, 10 and 11; Figs. 5 to 8). Even if some of the destruction is due to ischaemic necrosis one
Case 8. Figure 5—Partial destruction of the ninth and tenth thoracic vertebrae with spondylitis anterior in the sixth, seventh and eighth. Figure 6—The same spine seventeen months later. Spondylitis anterior has disappeared. The sixth, seventh and eighth vertebrae have recovered normal shape, the tenth has become almost normal in outline and regeneration is apparent in the ninth.

Case 11. Figure 7—Total destruction of the ninth thoracic vertebra and sub-total destruction of the eighth. Severe spondylitis anterior in the sixth and seventh. Figure 8—The same spine nine months later. The sixth and seventh vertebrae are restored almost to normal and some reconstruction has taken place in the eighth.
Case 13. Figure 9—The seventh thoracic vertebra is represented only by a dense sequestrum. Figure 10—Seven months later the sequestrum is "revascularised" and fused with the remnants of the sixth vertebra.

Figure 11—Total destruction of the ninth thoracic vertebra with considerable destruction of the eighth, tenth and eleventh. Figure 12—Three years later, considerable recovery is apparent in the eighth and eleventh, and some recovery is apparent even in the ninth and tenth.
should expect regeneration in the vertebra of a child just as one does in coxa plana, provided that mechanical pressure on the affected vertebrae be avoided. This involves prolonged recumbency. Regeneration of apparently ischaemic bone was shown by Dobson (1956). It can also be seen in Figures 9 and 10 (Case 13).

This possibility of regeneration of necrotic fragments raises a point of operative technique. In children the operation should consist of no more than a conservative costo-transversectomy, with removal only of pus and of spontaneously presenting sequestra. Curettage is to be avoided, for most of the bone which would be removed will regenerate and take its part in the growth of the spine (Figs. 11 and 12).

In Pott’s paraplegia of early onset in children, costo-transversectomy may have a wider application than was suggested by Seddon (1956). It is certainly the operation of choice in every early case of thoracic disease in children with an appreciable abscess but without paraplegia. Our conclusions in this respect agree with the view of Griffiths. Seddon and Roaf (1956): “We believe that this operation, enlarged to include the evacuation of accessible necrotic material, should be performed in all cases of thoracic tuberculous caries, with or without paralysis, if the radiographs show a shadow of an abscess and if the disease is recent.”

**SUMMARY AND CONCLUSIONS**

The following preliminary conclusions seem possible.

1. In early cases of Pott’s disease of the thoracic spine in children the treatment should include chemotherapy, recumbency and costo-transversectomy. An exception may be made if severe destruction has led to subluxation of the column, when more radical surgery is indicated.

2. Combination of conservative treatment with costo-transversectomy can prevent spread of the disease along the vertebral column, and can lead to regression of this “spondylitis anterior.”

3. The abscess can be totally eradicated and the risk of recrudescence therefore diminished.

**REFERENCES**


