SACRAL EXTRADURAL CYST: AN UNCOMMON CAUSE OF LOW BACK PAIN

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The diagnosis of low back pain may be difficult, particularly if physical signs are absent or unusual. The following case illustrates an unusual cause, and shows some of the features and signs that may be expected when an extradural cyst occurs in the sacral region.

CASE REPORT

A merchant aged thirty-one years, referred by Mr Eric Davies, of Calcutta, had four years previously begun to suffer from an ache in the lower part of his back. This was aggravated by bending but unaffected by coughing or straining. There was no history of injury. During the next three years he was troubled, at intervals of a few weeks, by attacks of backache. At the end of this time he suffered an additional sharp pain in the right sacro-iliac region which lasted for ten days. Thereafter he was free from symptoms until two months before his admission, when he had a further attack lasting only one day. A radiograph taken at this time showed an ovoid expansion of the vertebral canal (7.0 x 4.5 centimetres) in the lumbo-sacral region. This expansion had resulted chiefly from scalloping of the posterior aspects of the bodies of the upper three sacral vertebrae and of the lowest lumbar vertebra (of which there were six). In addition the pedicle of the sixth lumbar vertebra on the left side was eroded, and the ala of the sacrum was thinned and bowed backwards (Fig. 1).
These findings led to his admission to this unit. He was by then free from symptoms, and there were no abnormal findings on clinical examination. Lumbar puncture showed normal cerebrospinal fluid and pressure responses. Lumbar myelography showed that the lower part of the theca was attenuated and displaced backwards and to the right within the expanded sacral canal. Contrast medium could be seen to drip through a small orifice in the left side of the theca into a cystic cavity occupying the area of bone expansion (Fig. 2). Further radiographs taken two weeks later showed that all the contrast substance had entered the cyst, within which it moved freely (Fig. 3). These findings led to a provisional diagnosis of sacral extradural cyst. In view of the likelihood of recurrence of the patient's symptoms, and because of the possibility of sphincter paralysis recorded in comparable cases in the literature (Tarlov 1953), an exploration of the sacral region was decided upon.

Operation — The laminae of the fifth and sixth lumbar vertebrae and the thinned ala of the upper three sacral vertebrae were exposed by a posterior midline incision and removed

![Initial myelogram with the patient erect, showing displacement of the lower end of the theca to the right. Below this a few drops of contrast medium have collected within the extradural cyst.](Image)

(Mr M. A. Falconer). A sac consisting of a thin transparent membrane containing cerebrospinal fluid was found, occupying the greater part of the sacral canal. This sac was traversed by the second and third left sacral nerves, which were normal in appearance, and it had displaced the theca to the right and backwards. At the origin of the dural root sleeve of the second left sacral nerve a small pouch of arachnoid had herniated into the cyst and cerebrospinal fluid could be seen dripping into the cyst cavity from an opening in this pouch. The valvular nature of the aperture had evidently prevented the cerebrospinal fluid from returning to the subarachnoid space; fluid had therefore gradually accumulated and given rise to a false sac which had eroded and expanded the adjacent bone. In order to repair the herniation and close the leak in the arachnoid, the theca was opened with a posterior incision, and the arachnoidal sheath around the second left sacral nerve roots was divided where it entered
the dural sleeve. A collar of fascia was sutured around the roots at this point, thus sealing the opening in the dura. The posterior thecal incision was then closed. Histological examination of the cyst wall (Dr D. Naidoo) showed it to be composed of collagenous fibrous tissue without any sign of nerve fibres or ganglion cells.

Progress—Recovery from the operation was satisfactory. Post-operative myelography showed that contrast medium would no longer pass out from the spinal theca, and that the displacement of its lower end was now almost corrected. A year later the patient wrote that he was free from back pain, although he still experienced occasional discomfort in the back of his legs on strenuous exercise.

DISCUSSION

Pain similar to that described by this patient may be associated with intervertebral disc lesions, cauda equina tumours, spondylolisthesis, and tuberculosis of the sacro-iliac region, as well as by sacral cysts of perineurial or extradural type. The erosion of bone seen in the plain radiographs made disc protrusion alone an unlikely cause of his symptoms, and there was no sign of spina bifida. It required myelography to elucidate the problem further; this demonstrated the cystic nature of the lesion and showed that the expansion and erosion of bone were not due to pressure by a neoplasm.

The pathological nature of perineurial and extradural sacral cysts requires clarification. The perineural sacral cysts described by Tarlov (1938, 1953) occur at the junction of the posterior nerve root with the dorsal root ganglion, and arise in the space between perineurium and endoneurium; they may be nearly solid and may contain nerve fibres and ganglion cells. Communication with the subarachnoid space is never very free, and is usually not present. Erosion of bone and separation of the vertebral pedicles rarely occurs (Fig. 4).
In our case the cyst was of the extradural type. Such cysts were first comprehensively reviewed by Elsberg, Dyke and Brewer (1934), who found that most of those reported had occurred in the mid-thoracic region in patients under twenty years of age; Cloward and Bucy (1937) showed that the condition was frequently associated with adolescent kyphosis (Scheuermann's disease). No sacral example was described until the paper by Schreiber and Haddad (1951) appeared; since then three other sacral examples have been reported by Strully and Heiser (1954).

Extradural cysts arise from a diverticulum of arachnoid which has herniated through a dural defect. All the sacral examples reported have communicated freely with the subarachnoid space, though with cysts at other levels this communication has usually been obliterated. The wall consists of fibrous tissue and may or may not be lined with arachnoid-like cells. Sometimes, as in the case described, it may be surrounded by a much larger false sac produced by leakage of cerebrospinal fluid through a valvular opening in the true sac.

The origin of extradural cysts may be spontaneous or post-traumatic. The spontaneous variety owe their existence to a congenital failure of fusion of mesenchymal structures surrounding the neural tube, in which case they are a form of meningocoele, or they may arise (as in our case) from a defect in the dura mater adjacent to or at the origin of a root sheath. Post-traumatic extradural cysts were first reported by Hyndman and Gerber (1946), who described cervical and lumbar examples following spinal operations. One of the sacral extradural cysts reported by Strully and Heiser (1954) was of this type; their other two cases were spontaneous in origin, as was our own (Fig. 4).

There are no constant clinical features which allow sacral extradural cysts to be differentiated from perineurial sacral cysts or from prolapsed nucleus pulposus. The radiological appearances may, however, be of the utmost value in distinguishing them, since bone is generally expanded and eroded only by the extradural variety. Myelography amplifies the information, and if the contrast medium does not readily enter the cyst, late films (after at least twenty-four hours) should also be taken because its passage may be slow. Perineurial cysts do not usually communicate with the subarachnoid space sufficiently freely for them to be filled by the contrast substance, although small amounts may occasionally be seen to enter (Taheri, Riemenschneider and Ecker 1952, Strully and Heiser 1954). The presence of contrast medium within a sac, in conjunction with erosion of bone or widening of the vertebral canal, is strong evidence in favour of an extradural cyst. The case described showed all these features.

Most of the reported cases of extradural cyst have shown progressively increasing disability, despite remissions. Furthermore, if the condition is allowed to progress, sphincter disturbance from compression of the cauda equina is likely to follow, as has been described in conjunction with the perineurial variety (Tarlov 1953). Operation should therefore always be considered since evacuation of the false sac, if one is present, followed by removal or reduction of the arachnoidal sac and repair of the dural defect, has usually been followed by relief of symptoms.
SUMMARY
1. A case of low back pain due to a sacral extradural cyst is reported. Radiographs of the sacrum showed an ovoid expansion of the sacral canal. Myelography and exploratory laminectomy revealed an extradural cyst associated with a defect in the dural root sleeve surrounding the second left sacral roots. Relief of symptoms followed evacuation of the cyst and repair of the defect.
2. The differential diagnosis of the condition, the varieties of extradural cyst, and the features which distinguish them from perineurial cysts are described.

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REFERENCES