CONSERVATIVE MANAGEMENT OF TRANSVERSE FRACTURES OF THE SACRUM WITH NEUROLOGICAL FEATURES

A REPORT OF FOUR CASES

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Transverse fractures of the sacrum with neurological complications have been studied in four patients illustrating the following features: diagnosis is often delayed, there are radiological difficulties in making the diagnosis, and the indications for surgery are not well defined.

Specific radiographic views are recommended. All the cases presented in this report responded well to conservative management.

Transverse fractures of the sacrum are rare in isolation, though not uncommon in combination with fractures of the pelvis (Bonnin 1945; Fountain, Hamilton and Jameson 1977). Reynier et al (1982) found only two examples of isolated fracture of the sacrum with neurological complications in a series of 667 spinal fractures admitted over a 12-year period (0.3%).

The management of sacral fractures with neurological involvement can be conservative (Bucknill and Blackburne 1976), or operative (Ferris and Hutton 1983). We describe four patients, each with a sacral fracture and neurological features. They were treated conservatively and made spontaneous recoveries.

PATIENTS

Case 1. A 15-year-old girl was ejected through the rear of a hatchback car which struck a lamp-post. The injuries appeared to be superficial. She was admitted to a cottage hospital where she needed to be intermittently catheterised for urinary retention. Radiographs of the spine between T2 and the coccyx were taken and these were normal. She was transferred to our unit five days later when examination confirmed multiple abrasions, lumbo-sacral tenderness and straight leg-raising limited to 30° on each side. There was global weakness of the left leg with selective weakness of eversion, plantar flexion and hip abduction, and also diminished perianal sensation and anal tone with non-segmental patchy sensory loss in the left leg. Specific films (Fig. 1), clearly demonstrated a fracture of the sacrum; radiculography was normal. She was kept at rest and closely observed. The neurological deficit improved gradually and eight months following injury she had largely recovered. Some residual minimal weakness of ankle eversion and peri-anal sensation completely resolved at 18 months.

Case 2. A 57-year-old man fell 15 feet off a roof sustaining crush fractures of both heels and the body of L1. There was no neurological deficit; he was observed to have normal anal tone, no palpable bladder and normal cremasteric and bulbocavernous reflexes. The day after injury he developed urinary retention; he was catheterised and had to be re-catheterised four days later, at which time clinical examination showed bruising and diminished pin-prick sensation over the sacrum. Specific sacral radiographs demonstrated a transverse fracture. He required the use of the catheter and manual evacuation of his rectum for four weeks after the injury. Having failed to respond favourably to a trial of catheter removal at six weeks after the injury, he was discharged home with an in-dwelling catheter. On urological advice he had a transurethral prostatic resection, although the problem was clearly neurological rather than prostatic in nature; there had been no history of any prostatic symptoms prior to the injury. At four months he still had some back
discomfort but no urinary symptoms. Minimal sacral sensory impairment persisted but the patient was unaware of it.

Case 3. A 62-year-old female fell eight feet over a bannister striking her head and her back. Initial examination revealed a haematoma of the forehead, a painful right knee and limitation of straight leg raising on the right. She was tender over the sacrum, but no fracture was seen on the original films and there was no neurological deficit. On the fifth day after admission, her urinary output appeared to fall and she was found to have a palpable bladder. She was catheterised for 48 hours.

She sustained a second injury 12 days after admission, falling onto her buttocks. She became incontinent and developed a left sided foot drop; both ankle jerks were diminished and she had a left L5 and S1 sensory disturbance. Radiographs revealed a transverse fracture of the sacrum (Fig. 2) and radiculography showed that the lower thecal sac was displaced from the posterior surface of S1 with underfilling of the left S1 and L5 nerve roots. This was interpreted as an extradural haematoma.

Decompressive laminectomy was advised by the neurosurgical team but the patient refused the operation. She required an in-dwelling catheter for nine weeks, but within four weeks of it being removed she was passing urine satisfactorily. Her foot drop improved and the impaired foot sensation was also showing signs of recovery. At nine months her recovery was complete.

Case 4. A 47-year-old man fell 12 feet through a garage roof landing on his buttocks. On admission to hospital he complained of back pain and was unable to pass urine. He was tender over the lower sacrum. There was no neurological deficit (perianal sensation, anal tone and the bulbocavernous reflexes were specifically noted to be normal). Plain radiographs showed a transverse fracture of the sacrum with slight angulation (Fig. 3). Within 12 hours his ability to pass urine returned, although he felt difficulty in co-ordinating micturition and had to strain
to empty his bladder. The frequency and volume of his urine output was carefully monitored. He was placed on an alpha blocking agent after an ultrasound bladder scan showed an increased residual volume. He also had some numbness in the natal cleft.

His urinary symptoms completely resolved within three weeks, although the numbness in the natal cleft took several months to subside.

DISCUSSION

Of the four cases described, two had transverse fractures in isolation, one had an associated lumbar compression fracture and the fourth also had a pubic ramus fracture (case 2 – although the pubic fracture may have occurred in a separate accident). Denis, Davis and Comfort (1988) studied 776 patients with pelvic injuries of which 236 (30%) had sacral fractures, and just over a third of these were only recognised in retrospect. In the same study, 37 patients were described as having sacral canal involvement and 21 of these had neurological deficits, 16 (76%) involving bowel, bladder or sexual function. Fountain et al (1977) showed that 3% of fractures of the sacrum were isolated transverse fractures and three of our four cases are covered by this description.

The presence of neurological features makes the management extremely difficult because of the question of surgical decompression. The conclusions of Bucknill and Blackburne (1976) are similar to ours, suggesting an expectant policy, but other authors (particularly neurosurgeons) have recommended decompressive laminectomy. The literature contains 23 cases in which the neurological defect has been detailed and the outcome described, (Meyer and Wiltberger 1962; Rowell 1965; Goodell 1966; Purser 1969; Woodward and Kelly 1974; Bucknill and Blackburne 1976; Fardon 1976, 1980; Byrnes et al 1977; Fountain et al 1977; Heckman and Keats 1978; Weaver, England and Richardson 1981; Ferris and Hutton 1983). Of the 23 cases reported, 11 had decompressive surgery, 12 had no surgical intervention. Of the 11 patients decompressed, nine improved and two remained unchanged: nine of the 12 treated conservatively improved and three remained unchanged. It would appear that the most important part of the management of these cases relates to the bladder, rather than the spine.

In our series, three of the four patients experienced a delay in diagnosis, a common occurrence according to the literature (Laasonen 1977; Denis et al 1988). Spinal radiographs do not give a good image of the sacrum; specific views centred on the sacrum are needed. Denis et al (1988) stated that routine pelvic radiographs were almost useless in identifying sacral injuries with neurological symptoms. Any patient with suspected sacral fracture, therefore, requires specific sacral views to be taken.

The typical neurological complications of transverse fractures of the sacrum are:

1) bladder and bowel dysfunction;
2) diminished sensation over the sacral dermatomes;
3) weakness of musculature innervated by L5 and S1 nerve roots.

Most of these features were demonstrated in the four cases described here, although the frequency of bowel and bladder dysfunction was the most constant. Bowel or bladder dysfunction can occur alone (Denis et al 1988).

The four cases described demonstrate that it is easy for a sacral fracture to remain undiagnosed and it is important, once it is diagnosed, that the function of the bladder and bowel is carefully monitored and treated under specialist guidance. We suggest from this experience and from a review of the literature that a conservative or expectant policy can safely be pursued.

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REFERENCES