Lumbar burst fracture due to low voltage shock

A case report

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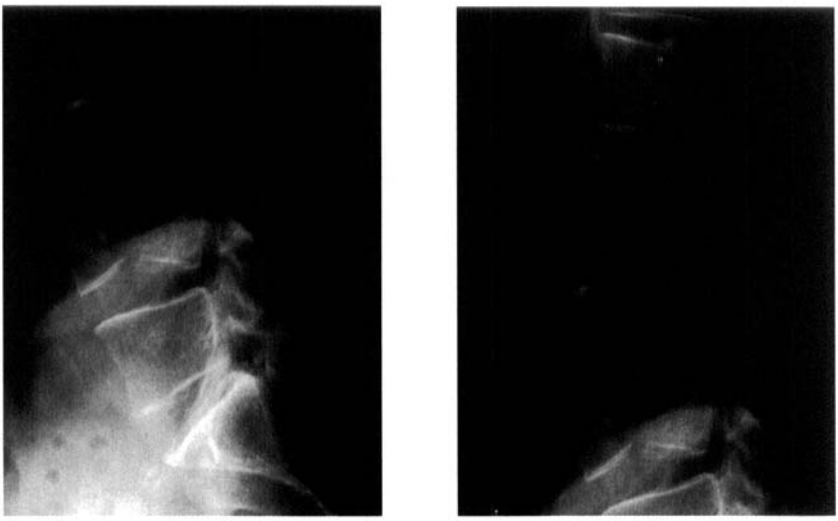
Submitted 95-02-15. Accepted 95-04-24

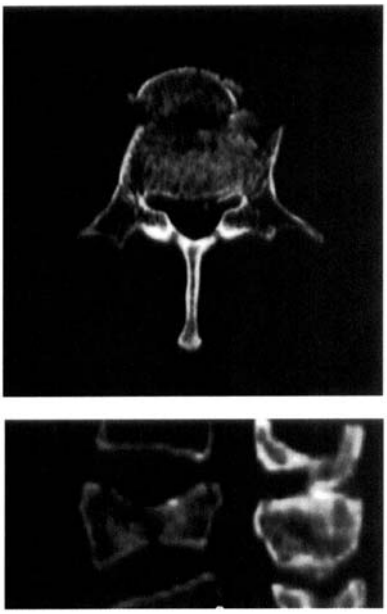
A previously healthy 62-year-old man suffered an electrical shock injury while inspecting the cellar of his house. He had a night-lamp with an extension cord in his left hand as he crawled under the floor, over the wet ground of the cellar. While doing this he suffered an electrical shock (220 volt) and was unconscious for a short time. He was unable to get rid of the lamp and his wife unplugged the wire. He could leave the cellar-flap by himself. There was a burn injury in the left hand and he felt low back pain. Because of the pain, the primary health physician advised him to stay in bed. The low back pain persisted and after 9 days he was referred to our hospital. He had tenderness over the lower back, but no neurological signs. Plain radiographs showed a fracture of the 4th lumbar vertebra with involvement of the dorsal cortex of the corpus. CT scan showed a burst fracture with anterior and middle spinal column involvement, and with a small bony fragment in the spinal canal. He was treated with a plaster corset, and was mobilized one week after admission. There were no neurological complications. Physical examination and radiographic follow-up after 3 months showed consolidation without deformation.

Discussion

Fractures of the vertebrae by a single electrical shock are rare and are usually seen after a high voltage injury (> 500 volt) or in association with a concomitant fall (Tompkins et al. 1990, Dumas and Walker 1992). Wilkinson and Wood (1987) and Baxter (1970) separately described 28 and 45 patients with high voltage electrical injuries (> 1000 and > 5000 volts, respectively), none of these patients suffered a vertebral



The lumbar spine at admission, 9 days after electrical injury. There is loss of height of the anterior and posterior borders of the corpus of L4. The other lumbar vertebrae are normal and show no signs of osteoporosis.



CT-scan and sagittal reconstructed scan through the compressed vertebra. The anterior and middle column are disrupted. There are some bony fragments in the canal.

fracture. Vincenti et al. (1969) evaluated 65 cases with high voltage injuries, of whom two had vertebral fractures. No comment was made about the mechanism of trauma or the level of injury in these specific patients. Most of their patients, however, also sustained a deceleration injury due to a fall: the majority were linemen repairing electrical power lines, or technicians working on television antennas. Vincenti et al. (1969) attributed the fractures, however, to the tetanizing effects of the alternating current on the voluntary muscles. Psychiatric patients, who in the past were treated with metrazol shock therapy without muscle relaxants, also sustain severe muscular tetany. Despite these contractions, vertebral fractures are rarely seen (Hamsa and Bennett 1939). The special feature in our patient was that he suffered only from a single low voltage electric shock.

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