

Traumatic lumbar disc rupture with compression fracture of vertebral body of another lumbar spinal level: a case report

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A case of traumatic lumbar disc rupture is reported. A 19-year-old Thai male patient fell from the third floor of a building three week previously. He suffered from severe back pain, but could walk for a short distance. After the pain subsided, he noted that the motor power of and sensation in his legs were progressively decreasing. A few day before admission he could not longer control his urination or walk any more.

From our investigation, we could demonstrate a 20% compression fracture of the L1 vertebral body and rupture of the L2-3 intervertebral disc impacting on the spinal cord. This caused cauda equina syndrome. A total laminectomy was done and a large amount of ruptured disc and end-plate material was removed piecemeal. The spine was stabilized with a Harrington intraction rod and sublaminar wiring. Usually a traumatic disc rupture occurs together with injuries of the vertebral end-plates and the disc content will extrude through the anulus fibrosus defect or will causes subluxation dislocation of the spine. Diagnosis of traumatic disc rupture should be kept in mind in the management of severe injury to the vertebral column in young patients.

Key word: Disc rupture, Traumatic, Compression Fracture

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ได้รายงานผู้ป่วยซึ่งได้รับบาดเจ็บต่อกระดูกสันหลังบริเวณเอวส่วนบน ร่วมกับมีอาการกดประสาท 1 ราย เป็นผู้ป่วยชายอายุ 19 ปีมีลักษณะพยาธิสภาพที่กระดูกสันหลังและหมอนกระดูกซึ่งค่อนข้างแปลกกว่าที่เคยรายงานมาก่อนและเพื่อเป็นข้อเตือนใจในการวินิจฉัยโรคอย่างรวดเร็วและถูกต้องรวมทั้งการรักษา ผู้ป่วยได้รับอุบัติเหตุตกจากที่สูงมีอาการปวดหลังและพบว่ามีการกดสันหลังหักที่ระดับ L₁ ร่วมกับมีอาการกดประสาทซึ่งไม่ไป/ด้วยกันกับลักษณะของกระดูกสันหลังหัก แต่พบว่าพยาธิสภาพซึ่งเกิดร่วมด้วยเป็นที่ระดับ L₂₋₃ มีลักษณะช่องหมอนกระดูกแคบและมีเศษกระดูกชิ้นเล็ก ๆ อยู่ในช่องกระดูกสันหลังซึ่งถ้าไม่สังเกตให้ดี จะไม่สามารถมองเห็นได้ และอาการทางระบบประสาทไม่ได้เกิดขึ้นทันทีทันใดตั้งแต่ได้รับอุบัติเหตุ แต่มาเกิดขึ้นในภายหลังและมากขึ้นเรื่อย ๆ จนกระทั่งผู้ป่วยไม่สามารถเดินได้และกลั้นปัสสาวะไม่อยู่ในอีก 3 สัปดาห์ต่อมา การรักษาควรจะทำผ่าตัดเพื่อเอาเศษกระดูกและหมอนกระดูกออกพร้อมกับเชื่อมกระดูกตรงบริเวณที่หมอนกระดูกแตกด้วย bone graft หรือเสริมความแข็งแรงโดยวิธีอื่น

In a young patient, it is not common to observe lumbar nerve root compression caused by a herniated disk. Key⁽¹⁾ reported only 2.1% of patients with this condition among the 10 to 19 year old age group. Kirkaldy⁽²⁾ found that, in the early stage of degeneration of the intervertebral disk, there will be circumferential and radial tears of the anulus fibrosus in patients 15-45 years of age, while there will be internal disruption in those 35-70 years of age. A herniated disk in a young patient is always caused by a severe injury to the spinal vertebrae.⁽³⁾ The injuries include tears of the cartilagenous vertebral end-plate, apophyseal ring,⁽⁴⁾ and anulus fibrosus. In a case of dislocation of the spine, there will also be dislocation of the disk and end-plate-apophyseal ring, and perhaps compression of the spinal cord.⁽⁵⁾

Cauda equina syndrome⁽⁶⁾ caused by dislocation of the spine is uncommon (1-16%). Of those cases that do occur, they may be divided into two groups: those with acute and those with non-acute onset. The patients with acute onset suffer severe root compression pain and the result of treatment is poor. Patients in the non-acute group always have less pain and better result of treatment. Urinary retention is a problem in both groups before and after treatment, even when muscular strength and sensation have already improved.

This is a case report of a young patient who had a severe spinal injury without any neurological deficits, but developed symptoms of cauda equina syndrome two weeks later. He was found to have a compression-fracture of the first lumbar spine with ruptured disk at the L2-L3 level compressed to the cauda equina.

A case report

A 19-years-old Thai male painter fell from the third story of his work site landing on his buttocks. He complained of very severe pain in his back and waist. No other parts of his body seemingly were injured. He was able to walk with support and had normal control of urination and defecation. Two weeks later, although his back pain subsided, he developed numbness and weakness in the lower extremities and was unable to control his urination. Three days prior to admission, he was unable to walk. He had no history of any of these symptoms. Physical examination revealed mild upper lumbar kyphosis, reduced lumbar lordosis, a negative straight leg-raising test bilaterally, grade O-III/V strength of his knee extensors, ankle flexors, ankle dorsiflexor plantar-

flexor, too extensors flexors bilaterally. He lost sensation from the L2-dermatome level, had poor perianal sensation, poor anal sphincter, tone no Barbinski response, no DTR of the knees or ankles, and no ankle clonus.

The X-rays (pictures no. 1,2). Revealed complete closed apophysis, L1 compression fracture of (about 20%) with some degree of Kyphosis. There was no posterior dislocation of any fracture fragment, but there was a narrowing of the L2-L3 space. A small piece of bone fragment 0.5×0.5 cm was found in the spinal canal. A myelogram (picture 3) showed an incomplete block at L2-L3. CT scans (pictures 4 and 5) revealed a large defect (size $5 \times 10 \times 20$ mm) between the bone and nerves in the dural sac. The diagnosis was traumatic disk rupture with cauda equina syndrome.

Surgical Procedure

Total laminectomy was formed at the L2-L3 spinal level. The whole lumbar disk was adhering to the cartilage end-plate and a small fragment of bone was found in the epidural space. Because the disk could not be taken out by ordinary means, a Kerison raunger was used to cut it into small pieces. We were able to take them out without tearing the dural sac. Spinal curettage was performed until the subchondral bones were visible on both sides.

Bilateral hemilaminectomies were performed at L1-L2 to explore the spinal nerves; no compression of the nerves was found at this level.

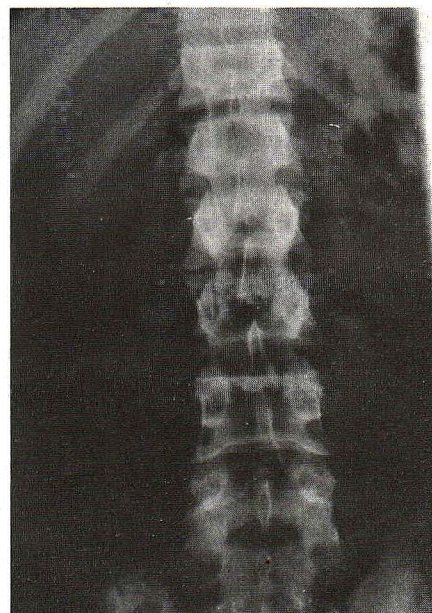


Figure 1. Antero-posterior view of lumbosacral spine demonstrated fracture at L 1



Figure 2. The lateral view show mild compression fracture of L 1 vertebral body whitout spinal canal involvement. But in carefully looking at the L 2-3, the findings were narrowing of the disc space and small fragment of cartilagenous end plate in the spinal canal.

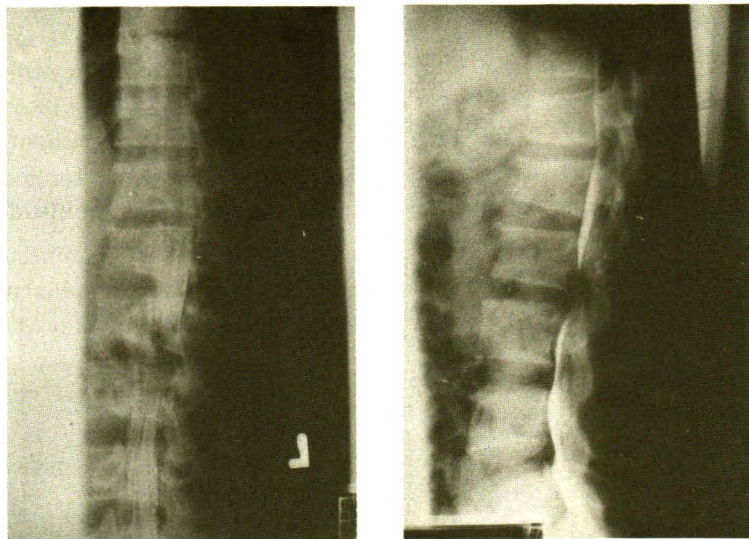


Figure 3. The myelogram revealed partial blocked at L 2-3 level both A-P and lateral view.

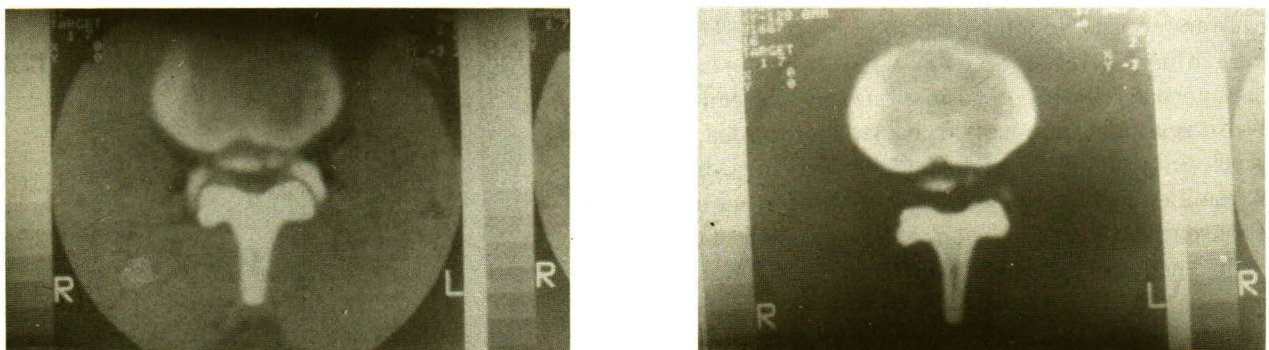


Figure 4-5. CT scan revealed rupture of the disc and fracture of the cartilagenous end plate.

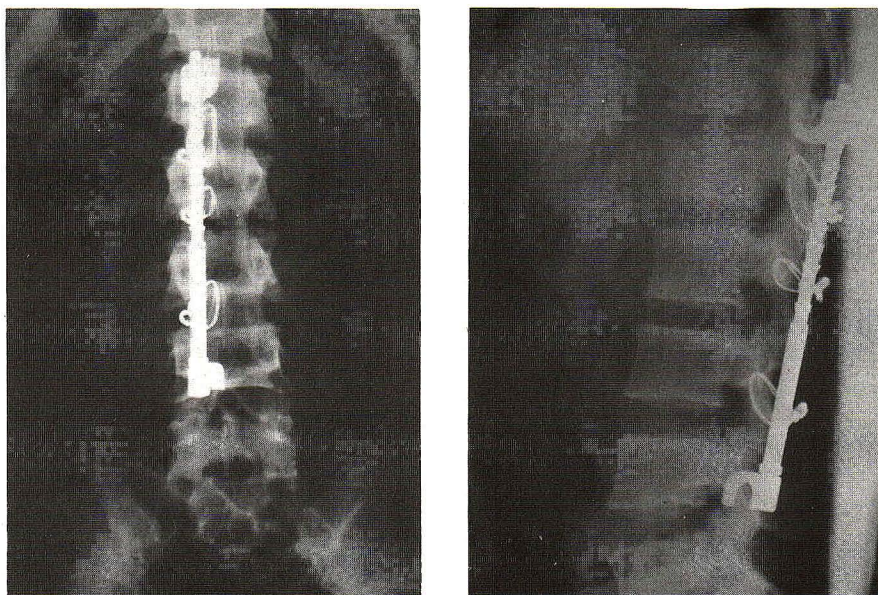


Figure 6. Post-operation. Removal of the end plate fracture and disc and single Harrington rod fixation plus sublaminar wiring.

After decompression of the dural sac, the lumbar spine was stabilized using a single Harrington's intraction rod and sublaminar wiring (picture 6) from just below the lumbar spine 1 and 2 to the L4 level to add strength to the L2-3; no bone graft was done, however.

With regard to post-operative care, after the patient was able to turn himself in bed freely for three days, ambulation was started.

Result

Three days post-operatively, the patient was able to sit and ambulate with a wheel-chair without any back pain. Muscular strength was restored to the point that the patient was able to walk behind a wheel-chair and able to ambulate with a walker in one week. The patient was trained to initiate self-intermittent catheterization until he was able to control his urination better than previously. Two weeks following surgery, he was discharged from the hospital. At that time, he was able to use crutches for ambulation.

Two months post-operatively, numbness in his legs and coccygeal area disappeared. He was able to walk with out any support, although it was difficult for him to walk up a slope. Cystometry became normal and there was no further back pain.

Discussion

This 19-year-old patient had severe multiple spinal injuries. The compression fracture of the L1

vertebral body might have been the cause of his early back pain. The ruptured intervetebral disk and cartilage end-plate formed a large mass similar to a tumor compressing the dural sac. At the beginning, the ruptured disk and the end-plate were not displaced, but with improper and inadequate treatment, this mass moved further into the spinal canal and caused a late canida equina syndrome.

X-ray findings were very important, because they revealed not only the compression fracture of the L1 vertebral body, but also the narrowing of the L2-L3 intervetebral space and a small bone fragment in the spinal canal. These finding were confirmed by myelography and CT-scan.

The purpose of surgery was not only to removed the mass and the bone fragment, but also stabilize the lumbar spine. Kramer⁽³⁾ suggested that, in cases of severe multiple injuries (such as this case), one should perform spondylodesis to prevent late instability and spondylosis. In this patient, currettage to both sides of the subchondral bone and stabilization with Harrington distraction and sublaminar wiring were performed to achieve immediate stability. Fusion of the L2-L3 bodies would have produced stabilization later.

Conclusion

Severe injury to a young patient's spine may cause rupture of a disk and displacement of cartilage end-plates and some fracture fragments forming a large mass which compresses the spinal cord.

Spinal injuries many occur at more than one level; thus, examination should be done. Abnormal X-ray findings might not correlate with clinical findings.

Proper and adequate treatment should be promptly provided. With compression fracture, absolute bed-rest should be prescribed until there is no more back pain. This may be followed by limited activities for at least three months of treatment. This regime would provide adequate healing and prevention of further displacement.

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