CASE REPORT: SURGICAL MANAGEMENT OF LUMBAR COMPRESSION FRACTURE

Yustinus Robby Budiman Gondowardojo,1* Tjokorda Gde Bagus Mahadewa2

ABSTRACT

The lumbar vertebrae are the most common site for fracture incident because of its high mobility. The spinal cord injury usually happened as a result of a direct traumatic blow to the spine causing fractured and compressed spinal cord. A 38-year-old man presented with lumbar spine’s compression fracture at L2 level. In this patient, decompression laminectomy, stabilization, and fusion were done by posterior approach. The operation was successful, according to the X-Ray and patient’s early mobilization. Pneumothorax of the right lung and pleural effusion of the left lung occurred in this patient, so consultation was made to a cardiothoracic surgeon. Chest tube and WSD insertion were performed to treat the comorbidities. Although the patient had multiple trauma that threat a patient’s life, the management was done quickly, so the problems could be solved thus saving the patient’s life. After two months follow up, the patient could already walk and do daily activities independently.

Keywords: adequate decompression and stabilization, early mobilization, comorbidities treatment

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INTRODUCTION

Based on a study in the United States of America, each year, approximately 160,000 patients had vertebral column injury.1 About 64% of those spinal injuries occurred in the thoracolumbar area.2 Spinal fracture considered as a fatal injury. The causes were accidents (45%), falls (20%), sports injuries (15%), violence (15%), and others (5%). Another study in Indonesia showed that 13% of vertebral nerve injuries were caused by workplace accidents, especially in the construction area. Most of the vertebral nerve injuries occurred at the cervical (55%), thoracic (30%), and lumbar (15%) level. Approximately, 95% of injuries occurred in one spinal area. 80% of those injuries were associated with multiple trauma. Diseases such as osteoporosis and spinal tumor could also cause fractures.3,4

Fractures, based on the damaged area and instability risk were divided into minor and major fractures. Major fractures included compression fracture, burst fracture, seat belt (chance) fracture, and dislocation fracture. As for the management of spinal fracture, immobilization, medicaments, and surgery were mentioned.2,3 In this study, we reported a case of L2 vertebral corpus compression fracture and lamina L2 fracture managed by laminectomy decompression with fusion stabilization surgery. In this case, there were comorbid diseases such as right lung pneumothorax and left lung pleural effusion managed by chest tube and bilateral WSD insertion. The purpose of this case report was to increase the awareness particularly about same cases scenario in the future and that if it could be managed well, quick, and adequate, even the compression fracture case with comorbid diseases, which was life-threatening, could have an optimal result and save patient’s life.

CASE REPORT

A 38-year-old man came with complaints of inability to walk or move his leg and pain in his back. Since 2 days before admission when he was climbing coconut tree at Karangasem area, suddenly he fell down with his back hit the ground. History of unconscious, vomiting, bleeding from ear, nose, and the mouth was denied. After the accident, he was brought to Sanglah General Hospital, was done Thoracolumbar CT Scan examination then his family decided to forced discharge and referred to Surya Husadha emergency unit using a private car, without paramedic assistance. On the primary survey, the airway was clear with C-spine control, breathing was normal with symmetrical movement and respiration rate was 20 times per minute. Blood pressure was 130/80 mmHg and pulse was 82 times per minute. From neurologic examination, it was found that the patient was comatos mentis with 15 Glasgow coma scale (GCS), had isokor and round pupil, with 3mm/3mm in diameter and positive pupil reflex for both eyes, and on motoric examination found to have paraparesis. The autonomous sensory examination was normal. There was a neurological deficit of the lower extremity which was decreasing motoric power into 1122/1122. The pain was in a scale 7 out of 10. Supporting
examination such as Computed Tomography (CT) Scan was done. The CT scan result showed vertebral corpus compression fracture at lumbar 2 level (Picture 1).

With fracture fragment being pushed posteriorly, causing constriction of the spinal canal together with lamina fracture at the same level (Picture 2, Picture 3). The patient was a candidate for decompression laminectomy with fusion stability surgery. After general anamnesis, the patient was positioned in the prone position.

After usual preparation of surgery on the skin, skin and subcutis incision was done to expose lamina L1-L2-L3, the fracture was located noticeably in left

![Picture 1](image1.png)

**Picture 1** Pre-operation CT scan picture showed lumbar 2 vertebral corpus compression fracture and lamina fracture

![Picture 2](image2.png)

**Picture 2** Pre-operation picture sagittal CT scan showed fracture at lumbar 2 vertebrae

L2. Laminectomy was done to release the pressure in the spinal nerve in L1-L2-L3 level. Pedicle screw was installed bilaterally alongside L1-L2-L3 pedicle with C-arm support, then 10 cm rod was installed and fixed. After epidural analgesia, surgical wound was sewn layer by layer. After the surgery finished, Segmental Spinal Instrumentation (SSI) X-ray was projected into the patient’s vertebral corpus at L1-L3, the position was good so that the surgery was also a success (Picture 4). After the surgery was finished, the lower extremity motoric power increased into 3333/3322. Early mobilization was also done to speed up the recovery.

![Picture 3](image3.png)

**Picture 3** Reformed sagittal reconstruction of 3D CT scan picture without contrast showed lumbar 2 vertebral corpus fracture

![Picture 4](image4.png)

**Picture 4** Post surgery X-Ray picture A/P and lateral showed good bone segment alignment and successful reduction
Right lung pneumothorax and left pleural effusion were also found at this patient. After consultation with the cardiothoracic surgeon, chest tube and WSD were installed. The patient was permitted to go home 2 weeks after surgery. At the follow-up, 2 months after surgery, the patient could already walk and do daily activities independently.

DISCUSSION

The lumbar fracture had unique radiology assessment, acute nerve injury and deformity compared to the chronic or degenerative deformities. Nerve injury usually caused by a sudden traumatic hit in the vertebrae which could further cause fracture or dislocation. In this patient, there was an unstable L2 compression fracture with L2 lamina fracture as a result of a fall from a high place. The fracture occurred at the vertebral corpus, pushed posteriorly causing vertebral nerve injury. The purpose of surgical management in this patient was to restore vertebral anatomy and neurology structure through decompression and early mobilization. These days, usage of modern technology could solve the problem in a patient with spinal nerve injury. Several years, surgeons already used internal fixation to prevent external fixation post surgery and to achieve quicker stability.

In a case reported by Rezaee et al., laminectomy surgery technique with the posterolateral approach was used in an unstable lumbar fracture with dislocation in L2-L3 level. Another case was reported by Gabriel et al., with L4 burst fracture with minor lost in vertebrae. In that case, vertebroplasty surgery with instrumentation was done. Our patient got open reduction surgery and internal fixation. We used the posterior approach in this case. In this case, it was advantageous that the surgery was performed to the patient as soon as the fall onset, resulting in a better post-surgery outcome. More than decades, surgical management of lumbar nerve surgery had shown significant progress.

Traumatic pneumothorax most often caused by blunt trauma or chest penetration. Both could cause fracture and costae dislocation which further cause rips of visceral pleura. Management of traumatic pneumothorax was chest tube installation. Pleural effusion represented a normal mechanism of liquid drainage from pleural cavity disturbance. The management was based on the severity of the case and the cause. Chest tube installation was suggested in pneumothorax, hemithorax, penetration trauma, and parapneumonic effusion or empyema. In this case, with the comorbid diseases of right lung pneumothorax and left lung pleura effusion, we consulted the cardiothoracic surgeon and chest tube and WSD was decided to be installed so the management of this patient was right and adequate.

CONCLUSION

Management for compression fracture at lumbar 2 vertebrae, in this case, was through surgical laminectomy decompression with stabilization and fusion using pedicle screw and rod. Chest tube insertion and bilateral WSD were installed to manage comorbid diseases in this patient. Postoperatively, patient’s condition was getting better as shown by increasing motoric power patient’s ability to walk and do daily activities without help after only 2 months post operation. We can now conclude that the best management for lumbar fracture with or without comorbid disease is surgery.

REFERENCES