

walker, wheelchair, bedridden) was investigated. Patients were divided into two groups: those maintain locomotive ability (ML) and those decrease (DL). Age, sex and the time until the patients were able to get about the house were compared between the two groups. Getting about the house was defined as an independently walking more than 15 meters, regardless of the use of walking aids. The t-test and χ^2 tests were used for statistical analyses, and the significance level was set at 5%.

Results: A total of 193 patients (mean age 82.0 years; 47 men and 146 women) were included in the study. Locomotive abilities at pre-injury were as follows: 120 patients with independently walk and 73 patients with cane. Locomotive abilities at discharge were as follows: 77 patients with independently walk, 68 patients with cane, 38 patients with walker, and 10 patients with wheelchair. One hundred nineteen of 193 patients were divided into ML, and 74 patients were divided into DL. The patients in DL were significantly older (80.5 vs. 84.4 years old; $p < 0.01$), and the time t until the patients were able to get about the house was significantly longer (11.6 vs. 18.1 days; $p < 0.01$).

Conclusion: The average time until patients were able to get about the house was significantly longer in DL (18.1 days). On the other hand, even in ML, the average time was 11.4 days. Although many studies recommend early intervention by minimally invasive surgery for OVF to prevent ADL deterioration, this study suggested that conservative treatment may be necessary for at least 10–14 days post-injury.

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BRAIN AND SPINE 3 (2023) 102351 102530

THE INFLUENCE OF COSTAL RESECTION ON PULMONARY FUNCTION AFTER TOTAL EN BLOC SPONDYLECTOMY FOR SPINE TUMOR

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Introduction: Total en bloc spondylectomy is indicated to achieve a local control of aggressive spinal tumor, or in the management of severe spinal deformity. However, the procedure in the thoracic spine technically requires bilateral rib resection to excise the vertebral body. The objective of this study was to evaluate whether a number of rib resection negatively impacts pulmonary function after the surgery.

Materials and Methods: Pulmonary function testing (PFT) of 31 patients undergoing vertebrectomy and spinal reconstruction was completed. There were 17 male and 14 female with a mean age of 54.1 years. PFT was performed prior to surgery and at 1 month, 6 months, 1 year post-operative visits. Any patients with obstructive lung disease, asthma history, and smokers were excluded from this study. Associations between a number of rib resection, and the results of PFT were analyzed based on the resected level of the thoracic spine.

Results: There was a significant decrease in forced vital capacity (FVC) at 1 month (71% of preoperative value, $p < 0.05$), 6 months (88%, $p < 0.05$) and 1 year (90%, $p < 0.05$). Meanwhile, the FEV1.0% remained stable during follow up. Patients who underwent vertebrectomy at 3 levels (3 pairs of rib resection) showed significant decrease in FVC (83.5% of preoperative value) compared to vertebrectomy at single level (1 pair of rib resection, 93.2%) at 1 year. Patients with upper-middle thoracic rib resection had a trend of lower recovery rate in FVC (88.3% of preoperative value) than those with lower thoracic rib resection (92.1%), however, there was no statistical difference.

Conclusion: Forced vital capacity decreased 1 month after vertebrectomy and returned to 90% of preoperative value at 1 year. Three pairs of rib resection showed significant decrease in FVC, suggesting a possible influence of a greater numbers of rib resection on pulmonary function.

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BRAIN AND SPINE 3 (2023) 102351 102531

KYPHOPLASTY VERSUS VERTEBROPLASTY CEMENT EXTRAVASATION AND OUTCOMES IN PATIENTS WITH METASTATIC SPINAL DISEASE

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Introduction: Over 1 million individuals in the US demonstrate symptomatic spinal metastasis, resulting in disability and decreased quality of life. Kyphoplasty and vertebroplasty are safe and effective treatments for painful metastatic

spinal lesions; however, cement extravasation is a common occurrence with limited outcomes data previously reported. This study compares the incidence of cement extravasation in patients with metastatic spinal disease following kyphoplasty versus vertebroplasty procedures. Furthermore, we compare post-operative outcomes.

Materials and Methods: All patients undergoing vertebroplasty and kyphoplasty in a 5 year period at a single institution were identified. Patients age 18–89 years who underwent kyphoplasty and vertebroplasty with a diagnosis of metastatic spinal disease were included. Prisoners and pregnant women were excluded. 21 patients who underwent kyphoplasty and 91 patients who underwent vertebroplasty were identified. Chi-Square and t-tests were performed. $P = 0.05$ was used for significance.

Results: The mean age of the patients undergoing vertebroplasty and kyphoplasty was 71 ± 12.1 and 60 ± 17.8 years, respectively. Patients who underwent kyphoplasty had a higher volume of cement injected, 4.33 ± 0.91 cc's versus 3.85 ± 0.61 cc's in vertebroplasty patients. 4 of 21 patients who underwent kyphoplasty had cement extravasation versus 4 of 91 vertebroplasty patients ($p = 0.02$). In all cases, the cement extravasation was either anterior or into the disc space and did not cause any adverse neurovascular effects. In all 4 patients undergoing vertebroplasty with extravasation, the cement was methylmethacrylate ($p = 0.01$). In patients undergoing kyphoplasty with extravasation, the cement was methylmethacrylate in 3 of 4 patients and high viscosity bone cement in 1 of 4 patients ($p = 0.22$). There was no significant difference in patient's pre-operative and post-operative ECOG scores, neurologic status, narcotic use, or ambulation status comparing independent versus assisted. However, patients who underwent kyphoplasty had a significantly greater decrease in mean pain score from pre-operative to 12 months post-operatively versus vertebroplasty with mean change scores of 7.4 ± 1.8 and 3.9 ± 3.4 , respectively ($p = 0.03$).

Conclusion: Patients undergoing kyphoplasty are significantly more likely to have cement extravasation compared to vertebroplasty; however, these patients also had a higher volume of cement injected and experienced a significantly greater decrease in mean pain score at 12 months post-operatively. Furthermore, all extravasations were radiographic in nature and not clinically relevant. The authors believe that limited cement extravasation into the disc space may aid in fracture stability and be beneficial to pain control.

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BRAIN AND SPINE 3 (2023) 102351 102532

FACTORS RELATED WITH NEUROLOGIC DEFICITS IN MID AND LOW LUMBAR SPINAL FRACTURES

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Introduction: Numerous studies have focused on radiological risk factors for neurological deficits in spinal cord injury or thoracolumbar junction area fractures. However, few have investigated mid and low lumbar fractures at the cauda equina level. The purpose of this study was to clarify radiological risk factors for neurological deficits in mid and low lumbar spinal fractures.

Materials and Methods: We retrospectively reviewed 71 consecutive patients who suffered acute traumatic unstable mid and low lumbar fractures (L2–L5) corresponding to the cauda equina level, as confirmed on magnetic resonance imaging. We defined a neurological deficit as present if the patient had some motor deficit in the lower extremity or autonomic system at the initial evaluation. Various baseline parameters, including age, gender, cause of injury, fracture level, AO fracture type, canal stenosis, vertebral compression ratio (VCR), interpedicular distance, and presence of vertical laminar fractures were compared between patients with and without neurologic deficit.

Results: Seventeen patients (23.9%) had neurologic deficits. The AO fracture type was more severe in the patient group with neurologic deficit ($P < 0.001$). Canal encroachment (69.8% vs. 35.1%, $P < 0.001$) and VCR (75.8% vs. 63.2%, $P = 0.004$) were severe in the patient group with neurologic deficit. In the patient group with neurologic deficit, the interpedicular distance ratio was larger (123.3% vs. 108.0%, $P = 0.005$). Vertical laminar fracture was more common in the neurologic deficit group. ($P = 0.023$).

Conclusion: In mid and low lumbar spinal fractures, the AO fracture type, canal encroachment, degree of vertebral compression, interpedicular distance, and the presence of laminar fractures, are strongly associated with neurologic deficits.