

component. This method is less traumatic compared to thoracotomy, reduces the severity of postoperative pain syndrome, has fewer complications, reduces the patient's recovery period after surgery and the duration of hospitalization.

#### BRAIN AND SPINE 2 (2022) 101190 101463 THE PREDICTIVE VALUE OF THE SPINAL INSTABILITY NEOPLASTIC SCORE (SINS)

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**Objective:** Spinal metastases may present with different degrees of mechanical instability. The Spinal Instability Neoplastic Score (SINS) was developed to assess spinal neoplastic-related instability. Few have validated it clinically. This study aimed to compare the progression of a pathologic fracture due to spinal metastases between a conservative treated group and a group treated according to the SINS-Score.

**Methods:** A retrospective analysis of patients with a pathologic fracture due to a spinal metastasis in 2018 was performed. We selected patients with a minimum follow-up of 12 months and analyzed them according to the SINS criteria. All patient in this group did not undergo any spinal surgery. For the interventional group, we selected all patient with initial diagnosis of spinal metastasis in 2020. For the further analysis we collected all patient, which underwent a spinal surgery in 2020 and a minimum follow-up of 12 months. For both groups were the primary endpoint the progression of vertebral body fracture following radiotherapy.

**Results:** In the conservative group 332 Patients were identified. Median age was 68. Median follow-up was 26 months. Fracture progression following radiotherapy was seen in 30%/30%/42% in cases with low/moderate/high-SINS. 17% of the moderate cases developed neurological deficits. In the interventional group 35 patient were identified. Median follow up was 12,2 months. Fracture progression following radiotherapy was not seen in any case.

The overall survival was 59% in the conservative and 75% in the interventional group. Analyzing the quality of life, we choose the walking ability as a main feature. 92% in the interventional group are still able to walk, in contrast 86% in the conservative group.

**Conclusion:** SINS is an especially useful tool for assess stability of a pathologic fracture due to spinal metastases after radiotherapy for spinal metastases. Furthermore, there are hints, that a corpectomy is not always necessary due to the secondary strengthening of the vertebral body by radio-oncology.

#### BRAIN AND SPINE 2 (2022) 101190 101464 THE TREATMENT OF SPINAL METASTASIS IN THE 21ST CENTURY

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**Objective:** Spinal metastases may present with different degrees of mechanical instability. The Spinal Instability Neoplastic Score (SINS) was developed to assess spinal neoplastic-related instability. This study aimed to compare the quality of life and the overall survival between patients following surgical instrumentation and radiotherapy and radiotherapy alone for spinal metastases.

**Methods:** A retrospective analysis of patients with a pathologic fracture due to a spinal metastasis with a minimum follow up of 12 months between January 2018 and December 2020 was performed. A matched pair analysis for sex, age, histology, and SINS score was performed between patients following surgical instrumentation and radiotherapy and radiotherapy alone. Overall survival and ability to walk was compared between both groups.

**Results:** Thirty-five patient per group were identified. Median age was 66 SD

+/- 14 and 60% were female. Most common Histology was breast cancer and was seen in 38% followed by bronchial cancer in 14% of cases. Unstable and potentially unstable fracture were seen in 74% and 26%, respectively. The overall survival was 57% and 75% in the radiotherapy and the surgery and radiotherapy group, respectively. Analyzing the quality of life, we choose the walking ability as a main feature. Ninety-two percent in the interventional group are still able to walk, in contrast 80% in the conservative group. (P= 0.24)

**Conclusion:** Tailored surgical approach according to the SINS score results in longer overall survival and higher rates of preservation of walking ability in patients with spinal metastases.

#### BRAIN AND SPINE 2 (2022) 101190 101465 EARLY RESULTS, COMPLICATION AND REVISION RATES FOLLOWING CFR-PEEK PEDICLE SCREW INSTRUMENTATION FOR SPINAL METASTASES AND SPINAL PRIMARY BONE TUMORS

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**Background:** Since many decades carbon-fiber-reinforced (CFR) polyethyl-ether-ether-ketone (PEEK) cages have successfully been used for intervertebral fusion. In the last years the idea emerged to use CFR-PEEK pedicle screw and rod systems in spinal tumor surgery, because CFR-PEEK reduces artifacts on computed tomography and magnetic resonance imaging facilitating the analysis of follow-up images with respect to tumor recurrence. Moreover CFR-PEEK shows less perturbation on radiotherapy dose distribution than titanium, so radiotherapy can be applied more precisely. We report our experience with CFR-PEEK for spinal stabilization because of spinal metastases or primary bone tumors.

**Methods:** We conducted a retrospective study comprising 321 patients undergoing spinal stabilization with a CFR-PEEK system for oncological indication from August 1<sup>st</sup> 2015 – October 31<sup>st</sup> 2021.

**Results:** 306 patients with spinal metastases and 15 with spinal primary bone tumors were included. On average 5 +/- 2 levels were instrumented. Vertebral body replacement was performed in 110 patients with spinal metastases and 11 patients with primary bone tumors. Intraoperative complications were documented in 66 out of 306 (22%) patients with spinal metastases and in 3 out of 15 (20%) patients with primary bone tumors. Revision surgery for postoperative complications was necessary in 47 patients (15%) and in 8 patients (53%), respectively. Implant related complications such as intraoperative screw breakage (11 out of 321 cases, 3%) and screw loosening were rare (7 out of 321, 2%).

**Conclusion:** CFR-PEEK is a viable alternative to titanium for oncological spinal instrumentation with low complication and revision rates. Further prospective trials are necessary to evaluate long-term results.

#### BRAIN AND SPINE 2 (2022) 101190 101466 SIX PEDIATRIC CASES WITH THORACIC VERTEBRAL PATHOLOGICAL SUBSIDENCE: GROSS TOTAL TUMOR REMOVAL, CORPECTOMY AND 360 DEGREE STABILIZATION VIA POSTEROLATERAL APPROACH

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**Background:** Langerhans Cell Histiocytosis is a rare non-malignant disease characterized by a clonal proliferation of mononuclear cells called Langerhans histiocytes and infiltrates surrounding tissues. Vertebral involvement is rare, mostly seen in the thoracic region and involves the anterior elements of the corpus.

**Methods:** Our case series consists of 3 for eosinophilic granuloma, 2 for aneurysmal bone cyst and 1 for osteoblastoma, age ranges between 15 months to 11 years. Eosinophilic granulomas were at the level of T3, T4 and T6, aneurysmal bone cysts were at the level of T9 and T11 and osteoblastoma was at the level of T10.

**Results:** An 18-month-old male with thoracic Langerhans Cell Histiocytosis who underwent surgery due to progressive neurological deficit. Gross total removal of the tumor with one level corpectomy in this patient was achieved via posterolateral approach with postoperative functional improvement. Surgical cavity was supported by corpectomy cage and unilateral screw-rod fixation system at the same stage.

**Conclusion:** Gross total tumor removal, corpectomy and 360-degree stabilization via posterolateral approach at single stage is a safe, effective and definite