

Navigierte ventrale Instrumentierung von thoracolumbalen Wirbelsäulenfrakturen

Image guided anterior instrumentation of thoracolumbar spinal fractures

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Objective

Minimally invasive procedures in spinal surgery are rapidly growing in popularity due to improvements in technique and the substantially reduced trauma to the patient versus open techniques. Image guidance is an enabling technology for minimally invasive procedures. To assess the clinical feasibility of image guidance for anterior instrumentation of thoracolumbar spinal fractures a prospective analysis of this procedure was performed.

Material & Methods

All patients with anterior instrumentation of thoracolumbar spinal fractures were recorded prospectively. According to the fracture type isolated anterior or combined anterior and posterior instrumentation was performed, each under image-guided assistance. Anterior approach was minimally invasive using thoracoscopy. The BrainLab® VectorVision® (5.0) image guidance system allowed computed-tomography-based navigation in all cases.

Results

From April 2002 until March 2004 56 patients (mean age 44years, range 18-74 years) were recorded prospectively. 18 isolated anterior and 38 combined instrumentations were registrated. Double rod instrumentation with bone graft was used with isolated anterior

approach in A1.2 (n=11) and A3.1 (n=7) fractures. Combined instrumentation with anterior expandable cage or single-rod with bone graft, respectively was indicated in A3.1 (n=9), A3.3 (n=13), B (n=8) and C (n=8) fractures.

Due to severe pleuritic adhesions we were not able to perform anterior stabilization in one case and in another patient we had to convert onto open procedure. We were able to reduce total operation time using navigation in combined procedures.

Discussion

Image guided spine surgery is reported to be advantageous in posterior instrumentation. However few data are available for the anterior approach. We were able to show accuracy of the computed-tomography-based navigation for anterior stabilization of thoracolumbar spinal fractures. More than 90% of the cases were completed with image-guided assistance. X-ray times were reduced and so were total operation times after initial learning curves. Image-guided spine surgery is technically feasible and clinically applicable in minimally invasive anterior approaches and is routinely used in our clinic.