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Minimally invasive treatment of pediatric spinal trauma

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Introduction: we retrospectively analyze the possibilities of minimally invasive treatment for pediatric spinal trauma operated on in the years 2019-2023 at the Department of Pediatric Neurosurgery at National Institut of Children's Diseases in Bratislava, Slovakia. The workplace is of national importance when it comes to treatments of complex spinal injuries. We have performed 24 surgical spine procedures for various spinal injuries. The department has a high-quality intraoperative 3D fluoroscope with the possibility of 3D acquisition for spinal neuronavigation and complete instrumentation necessary for operative spinal trauma, in accordance with current trends. This makes it possible to safely implant osteosynthetic or stabilization implants in a mini-invasive form in any spinal segment.

Results: 24 patients in total have been operated on (12 girls, 12 boys) due to spinal trauma. Out of the total surgeries percutaneous transpedicular stabilization dominated in compression fractures, mainly in the lumbar region (n=15; 62,5%). In two patients (n=2; 8.33%), we performed osteosynthesis for L5 bilateral spondylolysis for the first time at our department and L6 l.d.x. (lumbalization S1) - use of the spinal navigation system. The average age of occurrence of spinal trauma in our group is 14 years and 7 months. Statistical insignificance between the average age of occurrence of spinal trauma between genders (p=0.74).

Conclusion: the majority of patients in the group (n=17, 70.8%) were operated on minimally invasively, with a percutaneous approach. Minimally invasive surgical solution for spine trauma is characterized by the implementation of a small incision for surgical entry and thus reduces damage to soft tissues. The benefit is earlier healing, shorter hospitalization with a significant reduction in the consumption of analgesics. At the same time, the incidence of infection is reduced.