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Endoscopic approaches reduce postoperative atrophy of lumbar spine muscles*F. Zntz¹, E. Traupe², B. Greiner³, F. Beigelbeck⁴, M. Kraus⁵¹OC, München, Deutschland²Praxis für Neurochirurgie im GerMedicum, Germering, Deutschland³Orthopädische Gemeinschaftspraxis Dießen, Dießen, Deutschland⁴Joimax® GmbH, Karlsruhe, Deutschland⁵ORTHix Zentrum, Augsburg, Deutschland

Introduction: For a long time, microscopic assisted discectomy was the preferred procedure for lumbar disc herniation and other indications when fusion was not required. Since a couple of years, more minimally invasive, endoscopic procedures have been developed to minimize approach related morbidity. With first promising clinical results, more research is required to examine these new techniques. Aim of this study was the examination of muscle atrophy in postoperative MRI scans of operated patients.

Methods: A retrospective analysis of MRI scans of 10 patients for each method was analysed. The extension of muscle atrophy was determined in sagittal T2 weighted MRI sequences. As reference, the non-operated, other side was used.

Results: A MRI was carried out in both groups 6 month postoperatively. No atrophy was found in the endoscopic group. Interestingly, in the microscopic group, the muscle volume was increased on the operated side (7099 vs. 6957 Pixel, $p = 0.23$). In the muscle body although a hyper dens signal alteration indicated an atrophy zone, which showed an average value of 2320 pixel. Taking this into account, the operated side showed a significant reduction of functional muscle tissue ($p = 0.000$).

Discussion: With this study we were able to demonstrate a reduction of muscle trauma with endoscopic discectomy. Now, only few indications are frequently treated with the new method. The promising clinical results as well as the results of our study show the potential for a wider use and more clinical research to see advantages and limitations.

Literature

1. Jasper G., Francisco G., Telfeian E. A retrospective evaluation of the clinical success of transforaminal endoscopic discectomy with foraminotomy in geriatric patient. *Pain Physician* 2013;16:225-229
2. Gibson A., Subramanian A., Scott C. A randomized controlled trial of transforaminal endoscopic discectomy vs microdiscectomy. *Eur Spine J* 2017 Mar;26(3):847-856

Fig. 1

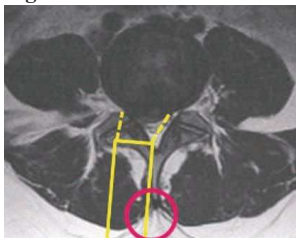
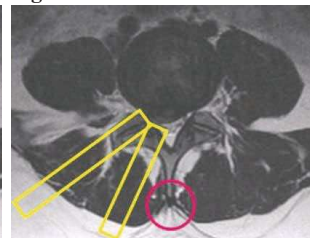


Fig. 2



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The 3 dimensional optic for the thoracoscopic vertebral body replacement - essential technological progress or just nice to have?*C. Jacobs¹, Y. Rommelspacher¹, P. Roessler¹, M. Plöger¹, M. Wimmer¹, S. Scheidt¹, D. C. Wirtz¹, R. Pflugmacher¹, F. Schildberg¹¹Universitätsklinikum Bonn, Klinik und Poliklinik für Orthopädie und Unfallchirurgie, Bonn, Deutschland

Background: Three-dimensional (3D) endoscopic optics use 2 cameras to simulate the different perspectives of the right and left

eye, creating the illusion of a spatial depth. An optimized orientation as well as an improved hand-eye coordination compared to 2D-optics could be proven in standardized test setups (black box) and in laparoscopic use. Whether these results can also be applied to thoracoscopic vertebral body replacement at the thoracolumbar junction is examined on the basis of this retrospective study. Hypotheses: 1) Ventral vertebral body replacement using 3D-thoracoscopy results in a shorter operation time compared to 2D-thoracoscopy. 2) Perioperative blood loss decreases due to better spatial orientation (faster hemostasis) and reduced tissue laceration.

Material and Methods: 29 patients met the inclusion criteria of this retrospective study. All of them received a ventral thoracoscopic vertebral replacement between 08-2012 and 08-2017 at the thoracolumbar junction (Th11 to L2). Patients with additional anterior procedures (e.g. anterolateral plate) were excluded. Perioperative data such as blood loss, duration of surgery and length of hospital stay were analyzed. The conventional 2D-optic was used in n=14 patients and the 3D-optic in 15 patients. The Aesculap EinsteinVision® 2.0 was used as the 3D-optic. Statistical significance was calculated using Student's t-test.

Results: The most common diagnosis was a L1 fracture (n = 18, 62%). Mean OR time was 24 minutes shorter in the 3D group (149 ± 29, 107-198min.) than in the 2D group (173 ± 39, 125-260min.), but not significant. The total perioperative blood loss of the 3D group was significantly lower than in the 2D group (**p=0.043). The proportional intraoperative blood loss of the 3D group was also lower (mean around 115 ml), but not significant. Significantly lower was the delivery rate of the thoracic drainage in the 3D group (248 ml vs. 560 ml, *p=0.195). Inpatient stay with the 3D group was on average 1.5 days (d) shorter (8.7d for the 3D group, 10.2d for the 2D group) but not significant (p=0.27).

Conclusion: The thoracoscopic assisted vertebral body replacement at the thoracolumbar junction is a safe and reliable surgical procedure using the conventional 2D-optic and the new 3D-optic. Both methods allow a thoracoscopic vertebral body replacement in comparable operation times but in our study the 3D-group presented with significantly reduced blood loss postoperatively. With regard to the small number of cases and because of its retrospective design, the present study is considered to be a pilot study only.

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Degenerative cervical myelopathy: Chronicle trauma leads to chronicle alterations of endogenic inflammatory and angiogenic mediators in CSF*C. Blume¹, L. O. Brandenburg², H. Clusmann¹, M. Geiger¹, C. A. Müller³¹Uniklinikum Aachen RWTH, Klinik für Neurochirurgie, Aachen, Deutschland²Uniklinik RWTH Aachen, Institut für Anatomie und Zellbiologie, Aachen, Deutschland³Uniklinik RWTH Aachen, Klinik für Neurochirurgie, Aachen, Deutschland

Introduction: Endogenous immune mediated reactions of inflammation and angiogenesis is a component of the secondary injury of the spinal cord in patients with degenerative cervical myelopathy. Aim of this study is to identify the alteration of certain mediators compared to a control group.

Material and Methods: Patients with DCM (n=28; 14 female; mean age 62.3±10.8) and indication for surgery were included. CSF samples were taken preoperatively. A control group of patients (n=38; 13 female; mean age 65.0±15.0), with abdominal aortic aneurysm (AAA), requiring surgery was established. Patients of this group received a CSF drainage for intrathecal pressure monitoring, samples were taken preoperatively. The neurological status of patients and controls was evaluated prior surgery including NDI and mJOA. Controls with any neurological