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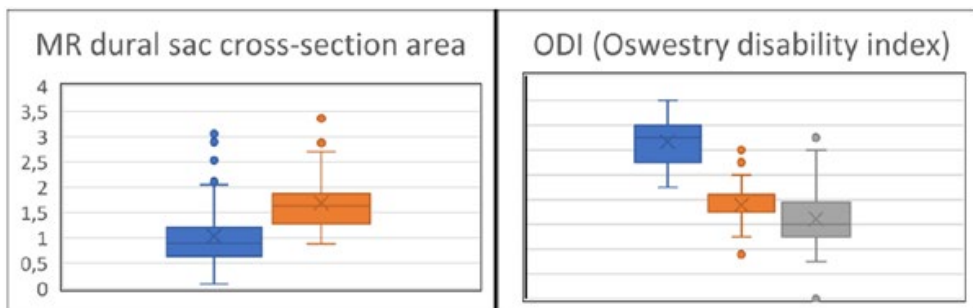
Effect of Indirect Neural Decompression through Extraforaminal Interbody Fusion for Degenerative Lumbar Disease

Statement of the problem: Traditional treatment for symptomatic lumbar stenosis uses direct posterior decompression with/without fusion. Using the direct decompression method could be complicated by incidental durotomy, perineural fibrosis, haematoma and postural muscle fibrosis. Alternative method to the treatment is methods using indirect decompression via limited approach. Purpose of the study is to evaluate clinically and radiologically the effect of the indirect decompression with extraforaminal interbody fusion.

Materials and methods: Eighty-two patients presenting with degenerative lumbar disease with segmental instability underwent extraforaminal interbody fusion combined with transpedicular fixation and circumferential fusion. All patients were clinically assessed using Oswestry Disability Index (ODI) and Visual analog pain scale (VAS) and magnetic resonance images were obtained preoperatively and one year postoperatively to measure the cross-sectional area (CSA), disc height, segmental and lumbar lordosis.

Results: The mean ODI significantly improved from 63,4 preoperatively to 32,3 postoperatively ($P < 0,001$). The mean VAS significantly improved from 5,95 to 2,63 postoperatively ($P < 0,001$). The mean CSA increased from 103mm² preoperatively to 169mm² postoperatively ($P < 0,001$). The median extension ratio of CSA was 33%. Disc height, segmental disc angle and lumbar lordosis also improved significantly. Only three (3,7%) patients were revised using direct central decompression due to neurologic deterioration.

Conclusion: Spinal stenosis was resolved successfully by indirect decompression through extraforaminal interbody fusion via transmuscular limited approach.



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Preoperatively			Postoperatively (3M)		Postoperatively (1Y)		Significant P<0,001)			Significant P<0,001)		
MR CSA	1,03	0,58	1,69	0,56			0,66	0,33	<0,001			
VAS	5,95	0,91	2,99	0,62	2,63	1,19	-2,96	1,03	<0,001	-3,32	1,40	<0,001
ODI	63,36	8,63	37,81	7,36	32,27	11,62	-25,54	9,81	<0,001	-31,09	14,05	<0,001

Figure 1 & Tab 1: Radiological (SAC) and clinical (ODI, VAS) effect of indirect decompression via ELIF method using transmuscular limited approach

Recent Publications

1. Lener, Sara et al. "Defining the MIS-TLIF: A Systematic Review of Techniques and Technologies Used by Surgeons Worldwide." *Global spine journal* vol. 10,2 Suppl (2020): 151S-167S. doi:10.1177/2192568219882346
2. Li, Jun et al. "Radiographic and clinical outcome of lateral lumbar interbody fusion for extreme lumbar spinal stenosis of Schizas grade D: a retrospective study." *BMC musculoskeletal disorders* vol. 21,1 259. 20 Apr. 2020, doi:10.1186/s12891-020-03282-6
3. Nakashima, Hiroaki et al. "Unplanned Second-Stage Decompression for Neurological Deterioration Caused by Central Canal Stenosis after Indirect Lumbar Decompression Surgery." *Asian spine journal* vol. 13,4 584-591. 15 Mar. 2019, doi:10.31616/asj.2018.0232

Biography

Josef Vcelak has joined the Orthopaedic Clinic of the 1st Faculty of Medicine of Charles University in Prague in 1999. After his board exams in orthopaedics, he began to specialization in spinal surgery and the management of septic conditions and complications in orthopaedics. He completed three long-term fellowships on these topics: one in the UK, one in Switzerland and one in Germany. In 2015, he defended his PhD thesis on "Surgical treatment of infection in spine". In 2019 he completed his habilitation thesis on "Osteoporotic fractures of the spine" and received the title of Associate Professor in Orthopaedics. He has been involved in spinal surgery for more than 15 years and in 2021 he received an advanced certification in spondylosurgery. He is also involved in the treatment of spinal cancer, carried out in cooperation with the Institute of Radiation Oncology and the Oncology Department of Bulovka Hospital.

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