HOSPITAL FOR SPECIAL SURGERY

Does L4/5 Pose Additional Neurologic Risk in Lateral Lumbar Interbody Fusion?

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Background

- Lateral lumbar interbody fusion (LLIF): increasingly used
- LLIF circumvents some of the challenges associated with anterior or posterior interbody fusion techniques
- However, LLIF has its unique set of complications
- Nerve-related motor deficits of the quadriceps and the tibialis anterior muscle = major clinical concern

Background

- Reported rates of motor nerve injury vary significantly
- Several risk factors have been proposed including performance of the procedure at the L4/5 level
- However, clinical studies show conflicting results
- The feasibility of performing LLIF at this specific level is a controversial topic in the spine literature

Aim of this Study

- To compare the rate of nerve-related motor deficits in patients undergoing single-level LLIF with and without L4/5 involvement

Materials & Methods

- Review of prospectively collected clinical data from a single, academic institution
- Inclusion: All patients treated surgically for lumbar spine pathology that underwent single-level LLIF with or without supplemental posterior fixation from 2006 to 2016
- Exclusion: Patients with missing pre- or postoperative motor exams

Materials & Methods

- New postoperative motor deficits = decrease in motor strength in the tibialis anterior or quadriceps femoris muscle at POV1 compared to preoperative baseline
- Resolution of motor deficits at last FU = return to preoperative baseline or recovery of full motor strength
- Regression analysis performed to examine the association of LLIF at L4/5 and the risk of new motor deficits.

Results

- 368 patients (54.6% female) met inclusion criteria
- Mean age was 59yrs (range 21–86yrs)
- 174 patients: single-level LLIF including the L4/5 level vs. 194 patients: LLIF without the involvement of L4/5
- Multivariate analysis: operating on L4/5 (OR=3.2) correlated with new motor deficit (p=0.022) at POV1

Recovery of nerve-related motor deficits in single-level patients

	LLIF without L4-L5	LLIF with L4-L5	P-value
Total number of patients	194	174	
New motor deficit at 6-week follow-up	7 (3.6%)	20 (11.5%)	**0.005**
Remaining deficit at last follow-up	1 (0.5%)	3 (1.7%)	0.348

Limitations

- Retrospective cohort study
- Standalone LLIF vs additional posterior fixation → we did not investigate the influence of supplemental posterior fixation
- Retraction time within the psoas has been shown to be a predictor of neurologic injury → exact retraction time unknown (operating time as a proxy)

Conclusion

- Our results are in line with previous studies which report an initial increased risk of new motor deficits for LLIF at L4/5
- However, the majority of new motor deficits resolved over time
- No difference in deficits between study groups at last FU

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