

Duration of Back Pain Symptoms and Its Relationship to Paralumbar Muscle Health

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Introduction

- Paralumbar muscle health has been indicated as an important factor for patients reporting back pain
- The ability to determine muscle health from lumbar MRI can be used to stratify patients presenting with back pain and potentially improve outcomes
- Analysis has not been performed to determine the significance between magnetic resonance imaging (MRI) - based paralumbar muscle health grade and patients' duration of back pain symptoms
- **Purpose:** To determine if there is a statistically significant relationship between the duration of patients back pain symptoms (>12 weeks or ≤12 weeks) and paralumbar muscle health (PLMH).

Methods

- Retrospective cohort study of a single surgeon's patients within the past 12 months at a Northeastern Healthcare system
- Paralumbar muscles on axial T2-weighted lumbar MRIs were outlined using ImageJ to determine the PL-CSA and LIV at the center of disc spaces from L1 to L5.
- Goutallier Classification was determined by the primary author.
- Quantile regression was performed to compare the PL-CSA, PL-CSA/BMI, and LIV between the two cohorts. Negative binomial regression was used to compare Goutallier class.

Methods Cont'd

- Inclusion Criteria: Patients of the senior author who were 18 years or older that presented with back pain symptoms and received magnetic resonance imaging (MRI) of the lumbar spine within the past 12 months were included in this study
- Exclusion criteria: Patients without an MRI that could be interpreted by the authors or a recorded duration of symptoms were excluded from the study as were patients with cancer pathology or trauma-induced injuries
- 551 patients met inclusion criteria; Cohort A consisted of patients reporting symptoms ≤ 12 weeks, and Cohort B included patients with symptoms > 12 week

Results

- There were significantly more females in Cohort B (66.2% vs 51.1%; $p < 0.001$)
- Mean BMI was significantly higher in Cohort B (30.13 vs 28.73; ($p = 0.005$))
- Significantly more patients had previous spine surgery in Cohort B (24 vs 40 patients; $p < 0.001$)
- No statistical significance was found at any lumbar level for PL-CSA (all $p \geq 0.34$), PL-CSA/BMI (all $p \geq 0.061$), Goutallier class (all $p \geq .49$), and LIV (all $p \geq 0.24$).

Results cont'd

	Cohort A (n= 229)	Cohort B (n=322)	P-value (<0.05)
Age, average	56.12	56.12	0.16
Sex (female), number (%)	117(51.1%)	213(66.2%)	<0.001
BMI, average	28.73	30.13	0.005
Hx previous spine Sx (%)	24 (10.4%)	40 (12.4%)	<0.001

Table 1. Patient demographics.

Conclusions

- The analysis did not find a statistically significant correlation at any level of the lumbar spine. Our results suggest that duration of symptoms may not be an accurate indicator for lumbar muscle health.
- These novel findings are clinically valuable as lumbar muscle health has been shown to be a marker for recovery. Further research is required to determine if there is a significant relationship between PLMH and post-operative outcomes. With this information patient's previously thought to be inoperable due to longstanding symptoms can be re-evaluated.