Psoas Muscle Mass are Maintained and No Progression of Fatty Degeneration after Lateral Lumber Interbody Fusion

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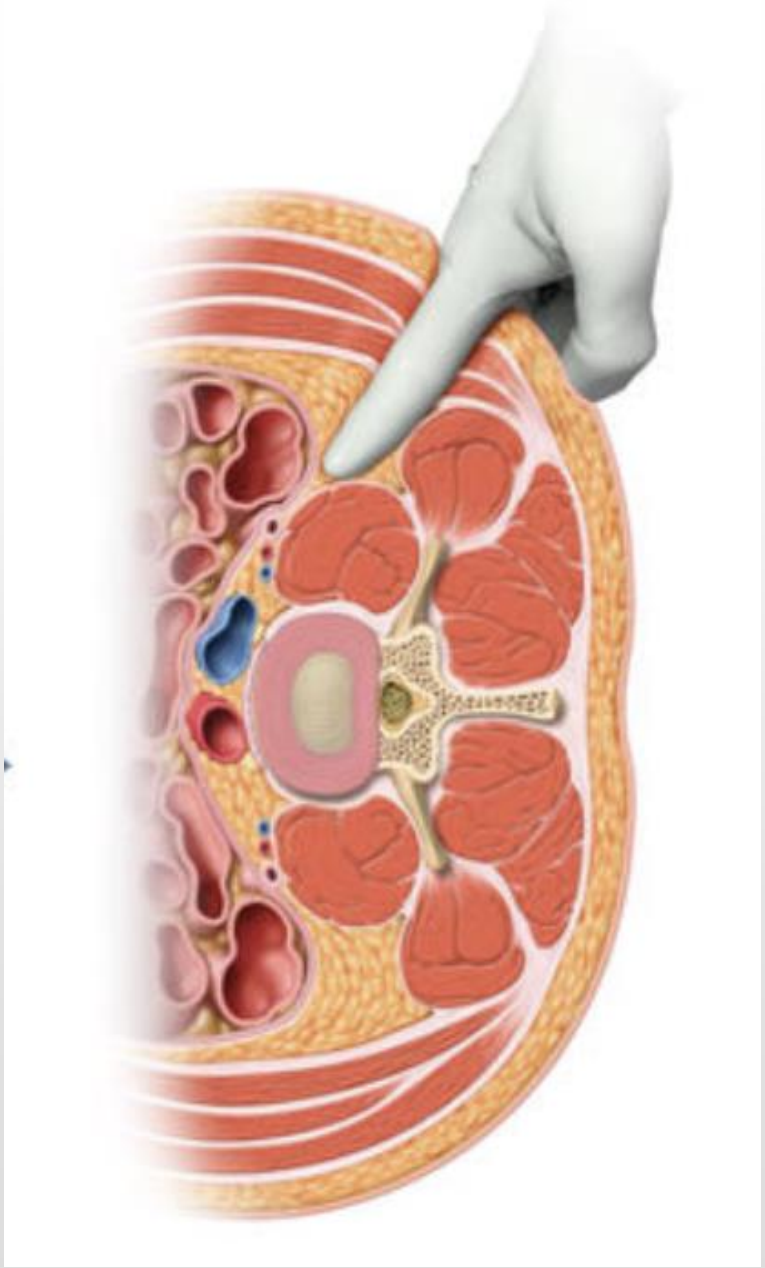
Scripps

San Diego Spine Foundation

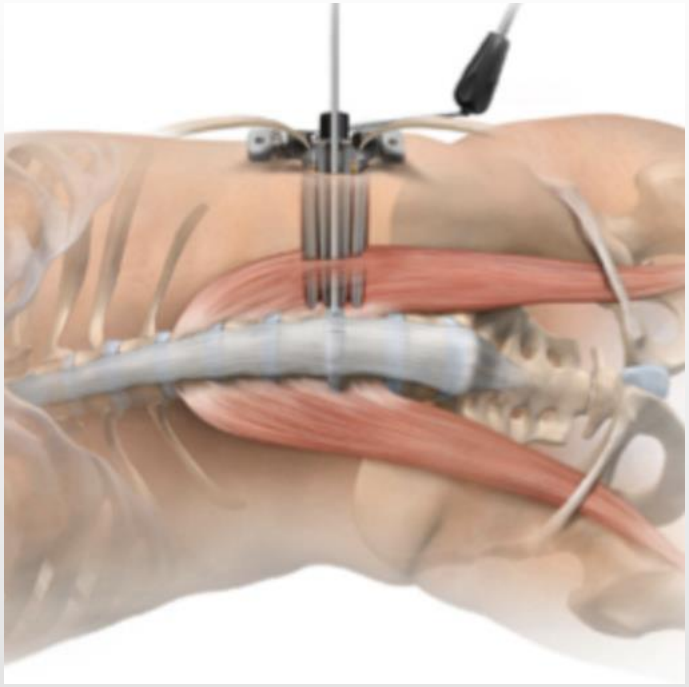
Background

The effect of surgical dissection through the psoas muscle on muscle volume and fatty degeneration from lateral lumbar interbody fusion (LLIF) is not well understood.



Purpose

The aim of this study is to determine the effect of dilation through the psoas muscle during LLIF as assessed by MRI following a year of postop recovery



Methods

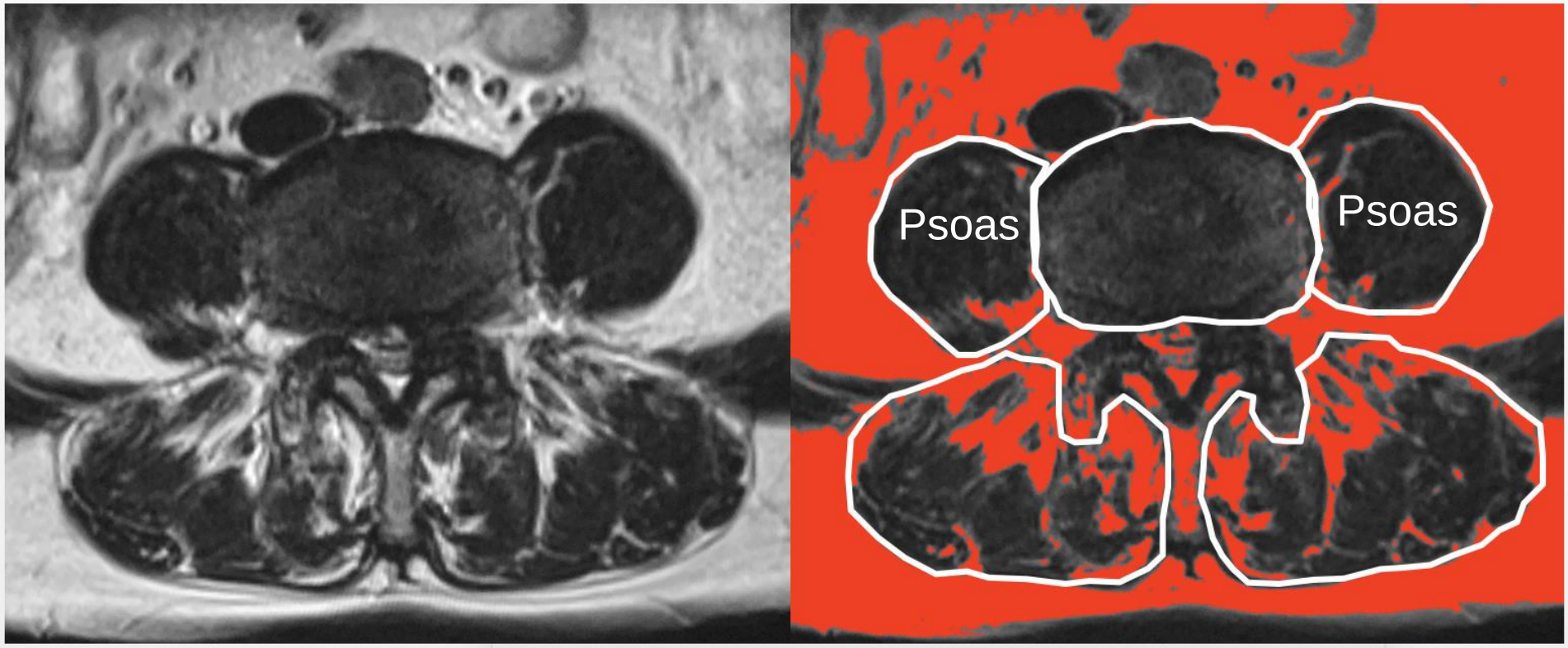
Subjects

- ✓ 2016-2017, Scripps Clinic La Jolla
- ✓ Degenerative Lumbar Disease
- ✓ L4-5 single level LLIF & bilateral PPS fixation
  Transpsoas approach, triggered electromyography
- ✓ Pre- and 1 y post-Op MRI
- ✓ Exclusion Criteria: Past surgical Hx, contraindication for MRI

Muscle Measurement

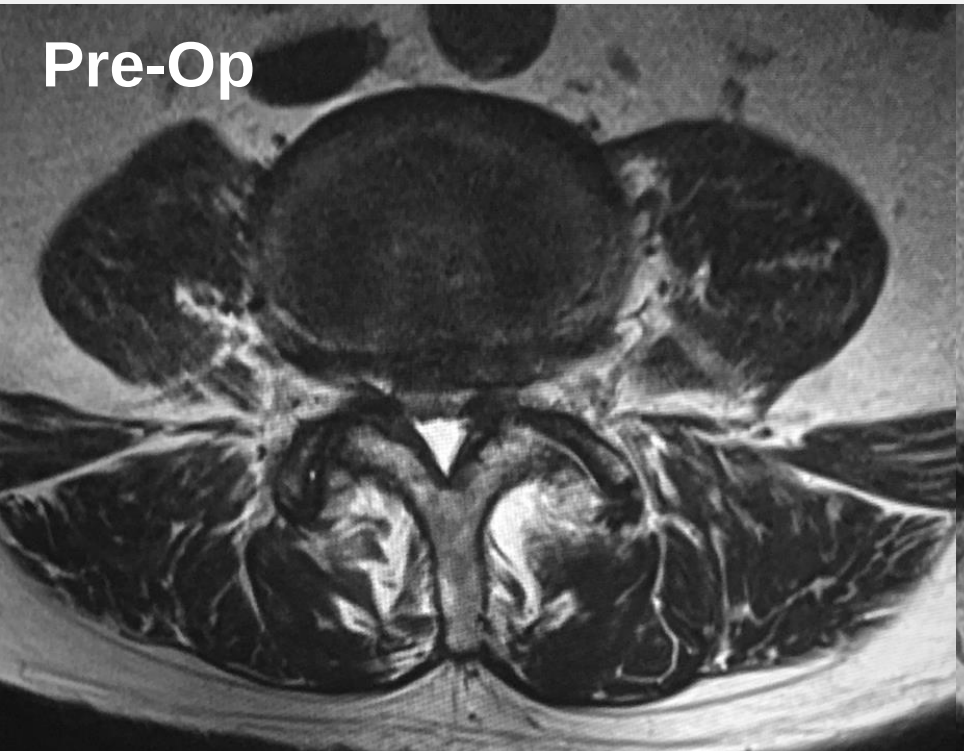
- ✓ Pre- and 1y post-Op MRI, T2 axial image at L4/5
- ✓ Cross sectional area(CSA) of psoas muscle
- ✓ Fat area (red area) with threshold method

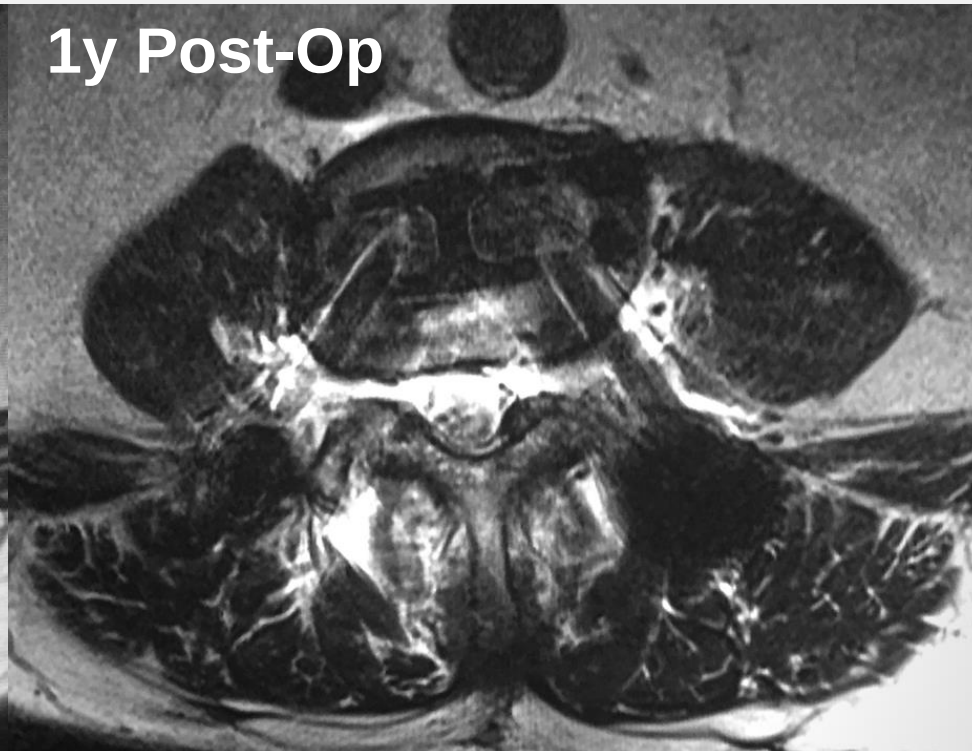
Lee, et al. Spine 2008



Pre- and 1y Post-Op

- ✓ Psoas CSA
- ✓ Fat area (FA)
- ✓ Oswestry Disability Index (ODI)
- ✓ Numeric Rating Score (NRS) for back and leg pain





Statistical Analysis

Paired T test, Chi squared test,
Pearson’s correlation,
Partial correlation,

$P<0.05$ considered significant

Results

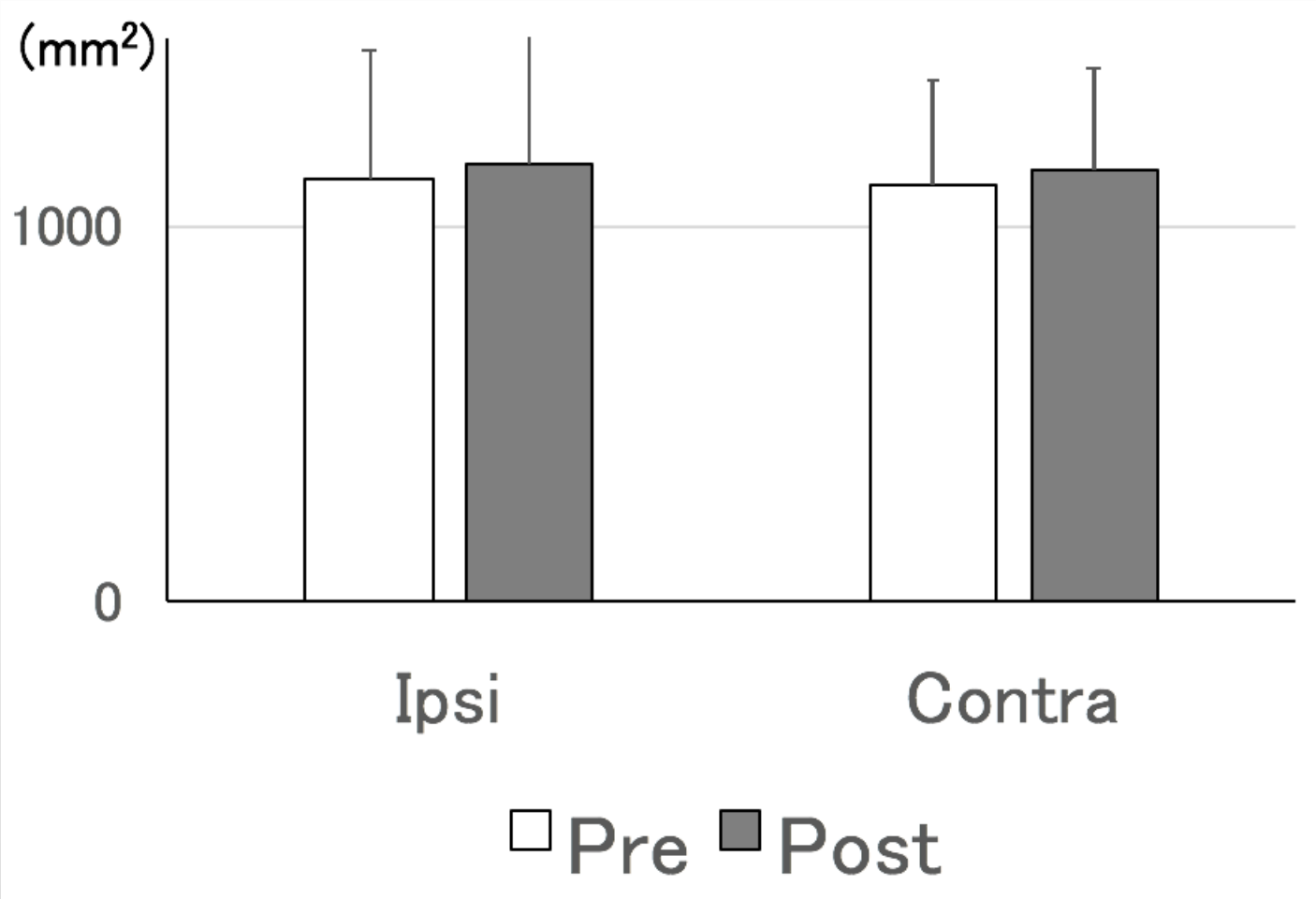
Patient's Characteristics

N	20
Male, female	7, 13
Age (years)	67.8 ± 8.4
Height (cm)	166.8 ± 8.4
Weight (kg)	78.4 ±15.7
BMI (kg/m^2)	28.0 ± 4.5

Clinical Symptoms before and after Surgery

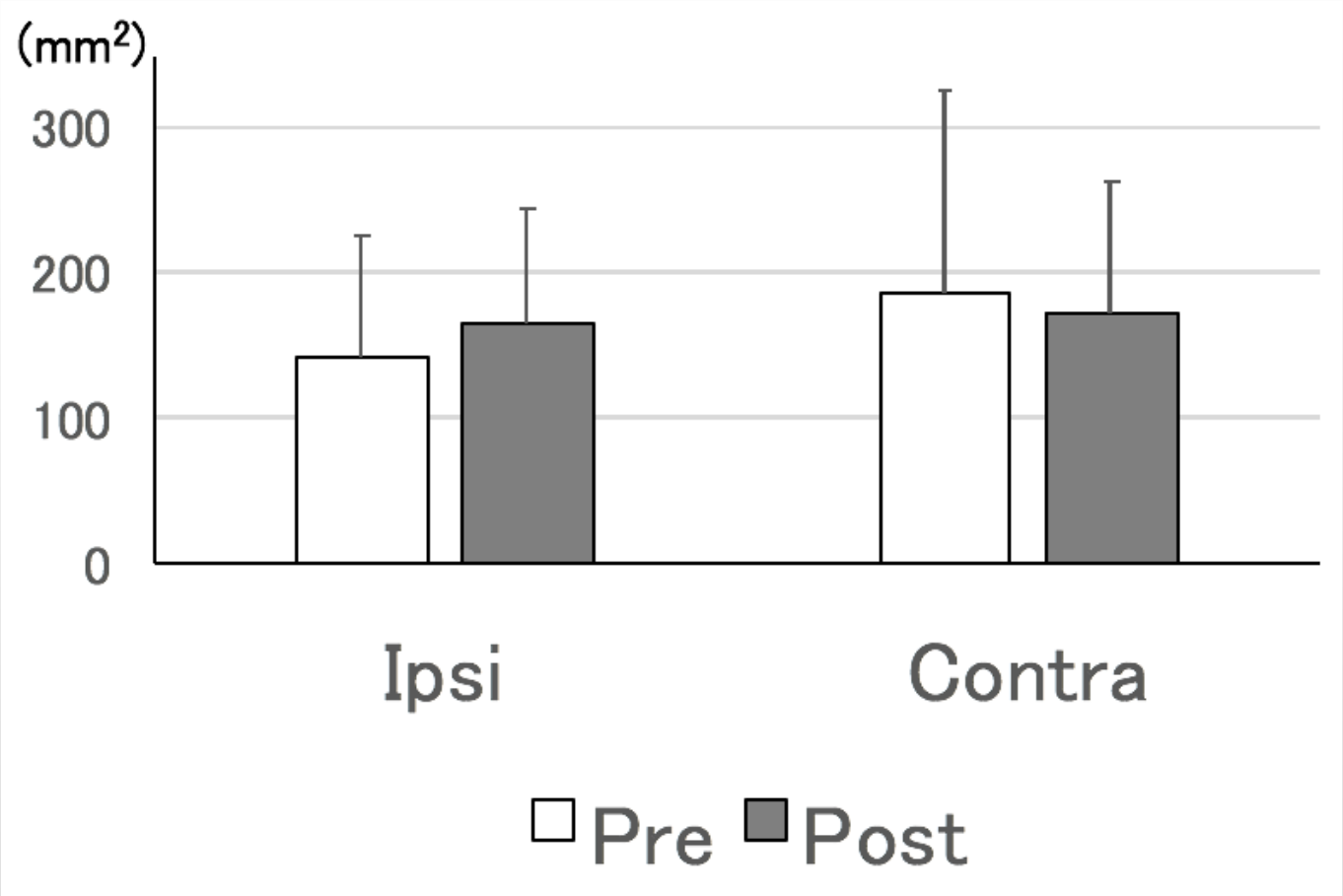
	Pre-Op	1y Post-Op	P value
ODI	40.6 ± 14.9	16.7 ± 17.3	< 0.001
NRS for back	5.4 ± 3.4	1.1 ± 1.1	< 0.01
NRS for leg	5.9 ± 3.1	1.7 ± 2.6	< 0.01

CSA of Psoas Muscle



Not significant

Fat Area of Psoas Muscle



Not significant

Correlation between muscle parameters and outcome measures

	⊿CSA		⊿FA	
	R	P value	R	P value
Ipsi				
⊿ODI	-0.18	0.55	0.13	0.67
⊿NRS for back	0.03	0.93	0.05	0.87
⊿NRS for leg	-0.05	0.85	0.38	0.10
Contra				
⊿ODI	-0.09	0.78	-0.52	0.07
⊿NRS for back	0.09	0.77	-0.21	0.94
⊿NRS for leg	-0.28	0.23	-0.45	0.05

No significant correlations

Discussion

Postoperative Muscle Volume

Past report

Ghiasi . Eur Spine J. 2016

- ✓Laminectomy, N = 6
- ✓Multifidus Muscle,
- ✓ **−11%**

Current Study

- ✓LLIF, N = 20
- ✓Psoas Muscle
- ✓Ipsi, **+3%**
- ✓**Contra, +4%**

Muscle detachment from bone

VS

Sequential dilation of muscle belly

Muscle Fatty Degeneration

- ✓ Progressed after lumbar laminectomy.

  Ohtori, Asian Spine J. 2016

- ✓ Progressed with aging.

  Lee SH, Spine J. 2017
  Davison, Aging Clin Exp Res. 2017

- ✓ More fatty in degenerative lumbar disease.

  Lee JC, Spine. 2008

Current Study

- ✓ Not progressed after LLIF

Conclusions

After LLIF,

- ✓ Psoas muscle volume was NOT decreased.
- ✓ Fatty degeneration was NOT progressed.