mild® vs. ESI Prospective, Randomized, Double-Blind, Cross-Over

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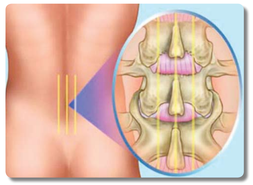
Study Methodology

- Prospective, randomized, double-blind, cross-over
  - *mild* procedure
  - Epidural Steroid Injection (ESI)
- Single center
- LSS patients exhibiting neurogenic claudication
- Patient & examining physician blinded through Week 6
- Cross-over allowed after Week 6 visit completed
- Visual Analog Scale (VAS)
- Zurich Claudication Questionnaire (ZCQ)
- Planned statistical analysis Week 12
- Comprehensive safety analysis

Structural Stability Maintained in Both Treatment Groups

- The *mild* procedure allows for decompression while leaving the ventral fibers of the ligament, the spinous process & the majority of the lamina intact without an implant. As with ESI, this enables alleviation of pain with continued natural stability.



mild/ESI Procedure Candidates

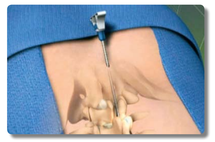
- LSS/radiologic verification of affected level(s)
- Neurogenic claudication confirmed & clearly differentiated from intermittent/vascular claudication
- Co-morbidities such as minimal to moderate osteophytes & disc protrusion expected & acceptable
- Hypertrophic ligamentum flavum confirmed
- No prior surgery/spinal fracture at treatment level

Differentiating Neurogenic & Vascular Claudication

Activity/Finding	Neurogenic Claudication -Symptoms?	Vascular Claudication -Symptoms?
Walking	Yes-relieved by flexion	Yes-relieved by stopping
Standing erect	Yes-relieved by flexion	No
Biking in flexed position	No	Yes-relieved by stopping
Peripheral pulse diminished	No	Yes

Note: LSS patients compensate for symptoms by flexing forward, slowing their gait, leaning onto objects (e.g., over a shopping cart) & limiting distance of ambulation. These compensatory measures, particularly in elderly osteoporotic females, are known to promote disease progression & vertebral fracture.

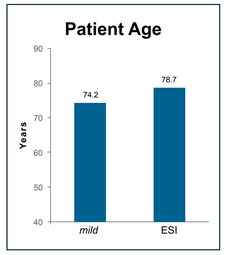
mild Procedure Description

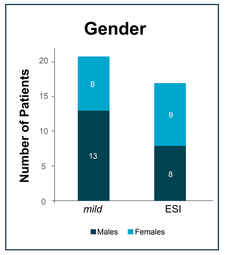


- Posterior approach
- Bolstered patient positioning
- Local anesthesia with conscious sedation
- Fluoroscopic imaging
- Small *mild* Portal access (6 G, 5.1 mm)
- Laminotomy & tissue resection to effect decompression
- Sterile adhesive strip wound closure
- Bilateral one-level operative time ~1 hour

Demographics

mild n = 21; ESI n = 17





Patient Accountability*

mild Treatment Group
- 21 *mild* patients randomized & treated
  - Week 6 reports: n = 21
  - Week 12 reports: n = 14

ESI Treatment Group
- 17 ESI patients randomized & treated
  - Week 6 reports: n = 14
  - Week 12 reports: n = 2 (small 'n' due to cross-over rate)

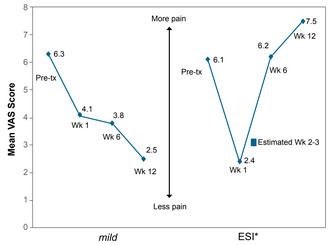
*Includes all available patient visits through 12 Weeks & prior to cross-over as of February 1, 2011. Cross-over results will be available later this year

Safety

- No serious procedure related events such as
  - Dural tear
  - Blood transfusion
  - Nerve root damage
  - Hematoma
- With no major procedure related complications reported, *mild* & ESI demonstrated comparable safety.
- Overall, per recent LSS surgical outcomes literature, *mild* & ESI were safer procedures than open or endoscopic surgery.[1,2]

[1] Weinstein, et al, for the SPORT Investigators. Surgical vs. Nonsurgical Therapy for LSS. New Engl J Med. 2008;358:794-810.
[2] Castro-Menéndez, et al. Microendoscopic Decompressive Laminotomy For Lumbar Stenosis. Neurosurgery 65:100–110, 2009.

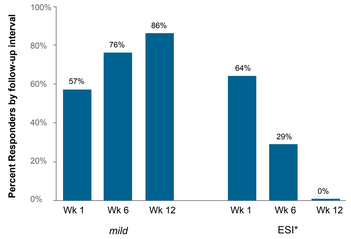
mild vs. ESI Visual Analog Score



- ANOVA with Repeated Measures found a significant change across time ($p<0.0001$) and a significant time-by- group interaction ($p<0.001$).
- The interaction can be seen above in reduction of VAS scores at all time periods for the *mild* group, compared to a reduction for the ESI group at Week 1 followed by a return to baseline.
- VAS 10-point scale where 0 = 'No Pain' & 10 = 'Worst Pain Imaginable'.

*ESI findings correlate with CRT 1 & 3 mo findings published by Fukusaki et al., Clin J of Pain 1998, concluding ESI has no beneficial effect in treating neurogenic claudication.

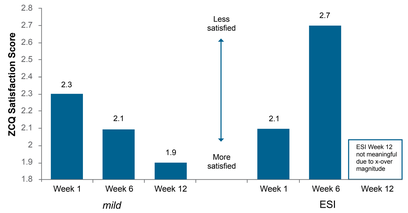
mild vs. ESI Responder Durability



- Overall Responder Rate higher with *mild* than with ESI
- Responder Durability extremely favorable with *mild* compared to ESI
- Responder is patient with pain relief ≥2 points on VAS

*Findings support Staal JB, Cochrane Database Syst Rev 2010 report incorporating 2 studies which concluded insignificant evidence to support use of injection therapy in chronic low back pain when ESI vs. placebo injections failed to favor the ESI group.

mild vs. ESI Patient Satisfaction



- Overall, *mild* patients became more satisfied (based on ZCQ) after treatment, while ESI patients became much less satisfied
- Satisfaction correlated with pain increase/decrease & with Responder Durability
- ZCQ measures satisfaction using 6 questions where 1 = 'Very Satisfied' & 4 = 'Very Dissatisfied'

Conclusions

- *mild* & ESI provide safe solutions for the treatment of LSS.
- Overall post-treatment patient satisfaction is higher with *mild* than with ESI.
- *mild* & ESI are efficacious treatment options available prior to more invasive surgical treatment.
- *mild* overall Responder Rate is higher & pain reduction more durable than ESI.
- ESI treats the symptoms.
- *mild* removes the symptom source.