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***Relationship between
Sedimentation sign
and Morphological
Grade in Lumbar
Spinal Stenosis***

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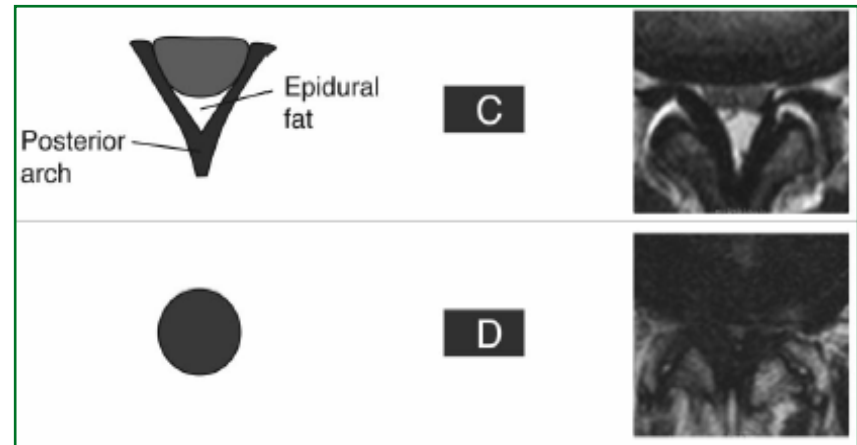
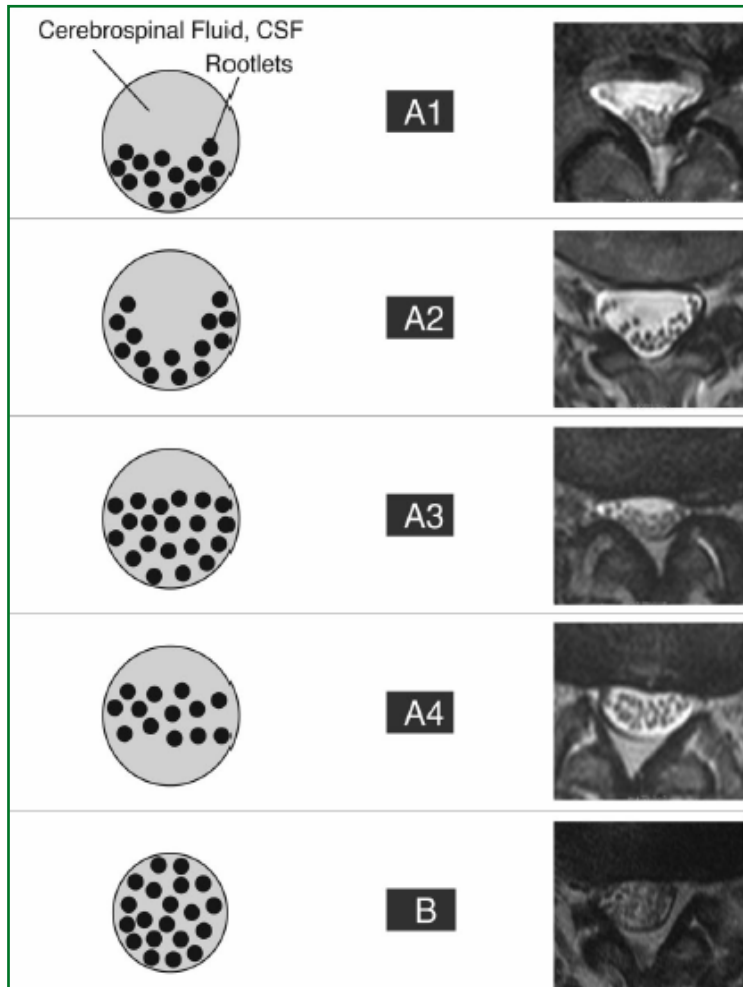
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Introduction

- No consensus about classification of lumbar spinal stenosis (LSS)
- | Usually: Dural sac cross-sectional area (DSCA) on MRI is used:
 - $<75 \text{ mm}^2$: absolute stenosis
 - $75 - 100 \text{ mm}^2$: relative stenosisBut, no clinical correlation
- 2 new morphological approaches:
 - Morphological Grade
Schizas C et al, Spine, 2010
 - Nerve Root Sedimentations sign
Barz T et al, Spine, 2010

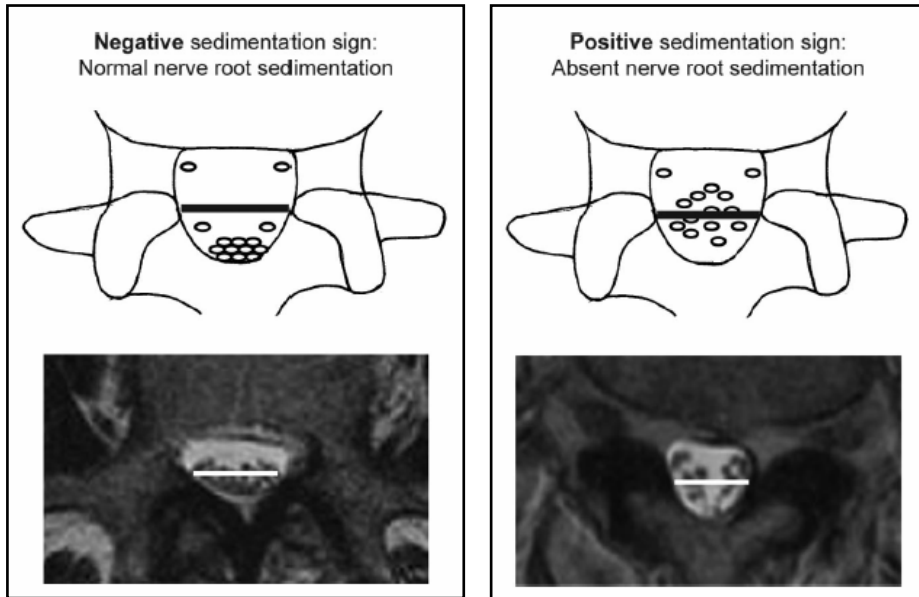
Introduction: Morphological Grade (MorphG)



- Prognostic value:
 - Grade C&D: strong predictors of failure of conservative measures (OR:30)
 - Grade A to B: unlikely need surgery (FU > 5 years)

Schizas C et al, Spine, 2010

Introduction: Nerve Root Sedimentation Sign (SedS)



- Mid height vertebral body above/below maximal stenosis
- Exception:
 - nerve roots leaving level below stenosis
 - L5/S1 excluded (S1/S2 roots “inhibit sedimentation”)

*“Absence of nerve root sedimentation in at least 1 transverse MRI scan, at a level above or below, **disregarding the location** of the scan within the level and its proximity to the maximal stenosis »*

SedS discriminates patient with and without LSS :

- SedS + ve 94 % in the LSS group
- SedS + ve 0% in the LBP group

Barz T et al, Spine, 2010

Purpose of the Study

- Study relationship between
 - Morphological grade (MorphG)
 - Sedimentation Sign (SedS)
- Defining likelihood to warrant surgery based on
 - SedS
 - MorphG



Material and Methods

<i>Type of Study</i>	Retrospective on prospective cohort
<i>Between</i>	2007-2013
<i>N</i>	137 patients
<i>3 groups</i>	<ol style="list-style-type: none"> 1. LSS treated conservatively (41) 2. LSS treated surgically(69) 3. LBP: group control (27)
<i>Women - Men</i>	79 - 58
<i>Age</i>	70 yrs (range, 36 to 89)
<i>Measure</i>	<ul style="list-style-type: none"> • Stenosis MorphG at all levels (A;B;C;D) • SedS (above and/or below the maximal stenosis at pedicle level, + ve or – ve)

Results:

Presence of SedS in the 3 groups:

	Surgery (69)	No Surgery (41)	LBP (27)
PSedS	46	16	2
NSedS	23	25	25

Surgery/No Surgery

Sensibility: 66%
Specificity: 60%
VPP: 74%
VPN: 52%
OR: 3.13 p<0.01

LSS/LBP

Sensibility: 56%
Specificity: 93%
VPP: 97%
VPN: 34%

Morphological grade in the 3 groups:

	Surgery (69)	No Surgery (41)	LBP (27)
MorphG C-D	67	17	5
MorphG A-B	2	24	22

Surgery/No Surgery

Sensibility: 97%
Specificity: 59%
VPP: 79%
VPN: 92%
OR: 47 p<0.01

LSS/LBP

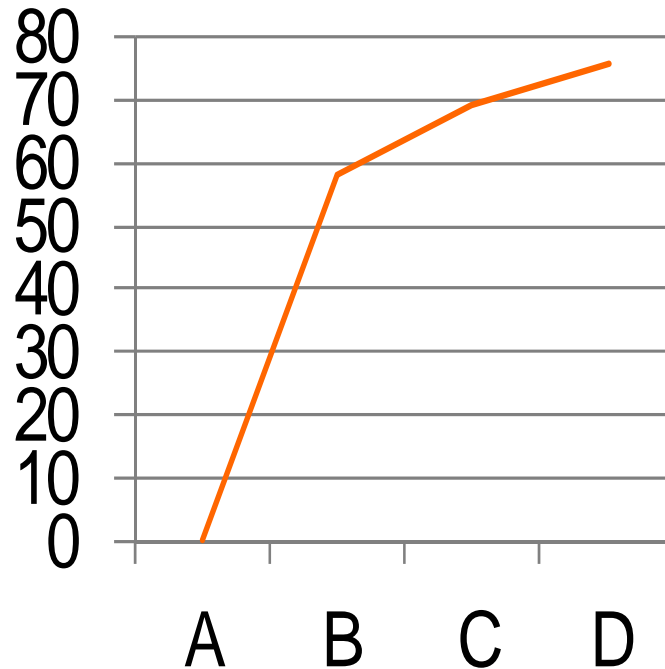
Sensibility: 76%
Specificity: 92%
VPP: 94%
VPN: 45%

Surgery vs conservative treatment

- SedS +ve : OR: 3.13
- C&D grade: OR: 47

Results:

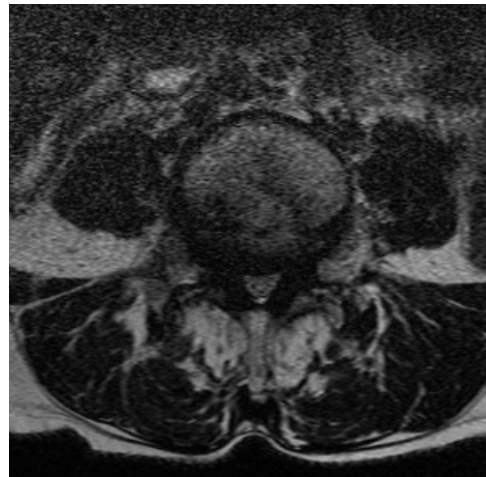
Morph G	PsedS
A	0%
B	58%
C	69%
D	76%



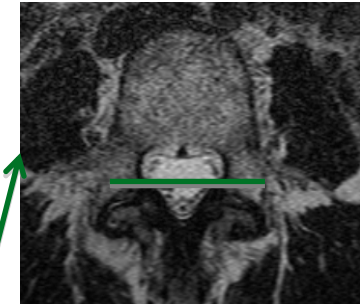
- With high MorphG, the SedS are more positive
- Between two grade C-D, the SedS is always positive

Example : MorphG C - Neg. SedS

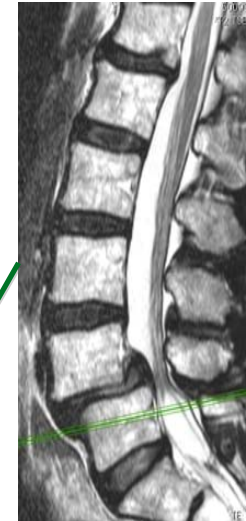
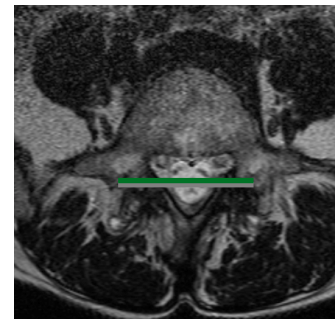
L4-L5: Grade C stenosis - antelithesis



L4: Neg.
SedS



L5: Neg.
SedS



Discussion & Conclusion

- Macedo et al:
 - Relation between DSCA and SedS
- Fazal et al:
 - Relation between SedS and level to operate
- Our study is the only that looks into the relation between MorphG and the SedS
- Certain correlation between MorphG and SedS
- Limitations of our Study:
 - follow up <10 years
 - LSS natural history ?

Discussion & Conclusion

- MorphG carries a higher prognostic value than SedS →

OR 47 vs
3.13

- SedS: cannot discriminate between

- non surgical candidates
- surgical

Morph G	PsedS
A	0%
B	58%
C	69%
D	76%

- SedS cannot guide as to which level need decompression

Ref:

- Schizas et al. Qualitative grading of severity of lumbar spinal stenosis based on the morphology of the dural sac on magnetic resonance images. Spine, 2010 Oct 1;35(21):1919-24.
- Barz et al. Nerve root sedimentation sign: evaluation of a new radiological sign in lumbar spinal stenosis. Spine, 2010 Apr 15;35(8):892-7
- Fazal et al. Does the presence of the nerve root sedimentation sign on MRI correlate with the operative level in patients undergoing posterior lumbar decompression for lumbar stenosis ? Spine Journal, 2013 Aug;13(8):837-42.
- Macedo et al. The sedimentation sign for differential diagnosis of lumbar spinal stenosis. Spine, 2013 May 1;38(10):827-31.

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