



Predictive Parameters for Successful Indirect Decompression with Lateral Lumbar Interbody Fusion

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Background and rationales

- Lateral lumbar interbody fusion (LLIF) : XLIF ,DLIF , OLIF
- Multiple advantages
 - Less perioperative pain
 - Less blood loss
 - Few complications
 - Less hospital stay
 - Comparable clinical outcome

“Indirect decompression effect”

- Previous studies

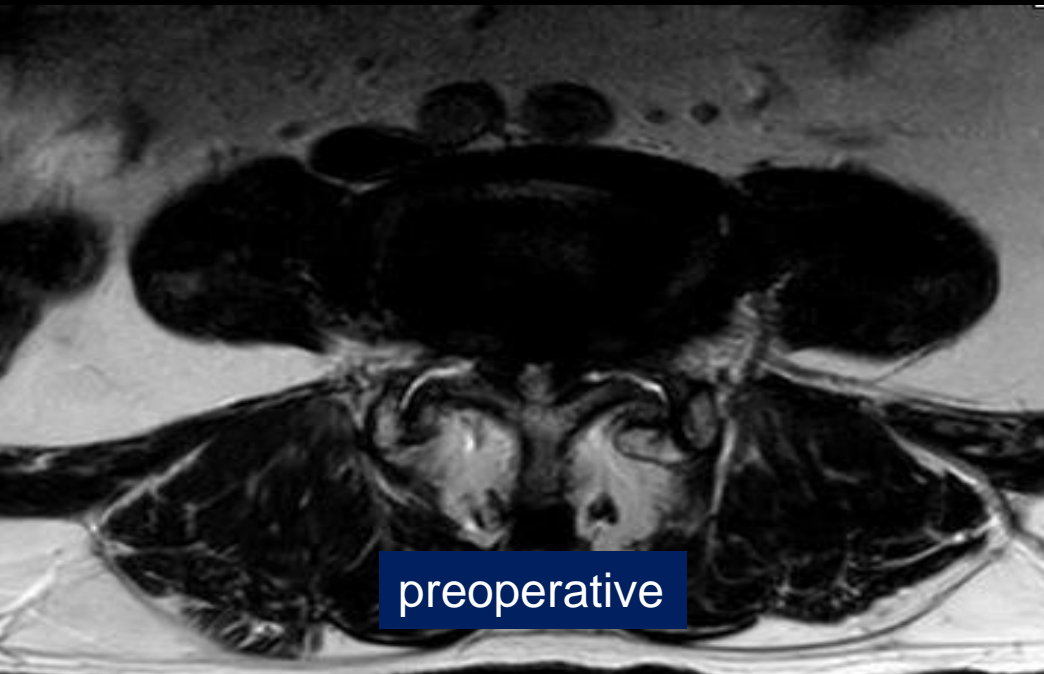
- Oliveira L , et al. , *Spine* 2010

- Kepler CK et al. , *J Neurosurg Spine* 2012

- Shunsuke Fujibayashi et al. , *Spine* 2015

Reveal effect of indirect decompression by LLIF

“Which Preoperative radiographic parameters are correlate with successful indirect decompression by LLIF ??”



Objectives

Primary

To find out which radiographic parameter is correlate with successful indirect decompression with LLIF

Secondary

To confirm effect of indirect decompression in LLIF surgery

Methods

- Retrospective and prospective reviews preoperative and postoperative imaging of patients undergo LLIF surgery in KCMH

Inclusion

- Patients undergo LLIF surgery in lumbar region since June 2016
- Age > 18 years
- Complete preoperative and postoperative imaging
 - Preoperative : plain film AP/Lateral/Flexion/Extension
 - Preoperative : MRI
 - Postoperative : plain film AP/Lateral
 - Postoperative : MRI

Exclusion

- Trauma/tumor/infection case
- Incomplete pre or postoperative imaging
- LLIF in other regions
- Direct decompression patients

Parameters for measure

- Disc height (DH)
- Foraminal height (FH)
- Translation (TL)
- Segmental disc angle (SDA)

:From standing in plain film and supine on MRI

- Canal diameter
- Canal area

:From supine on MRI

- Δ disc height
- Δ foraminal height
- Δ translation
- Δ segmental disc angle

:From (supine) MRI – (standing) plain film
:For observe effect of postural reduction

Successful indirect decompression criteria \rightarrow increase spinal canal area \geq 30 %

Results

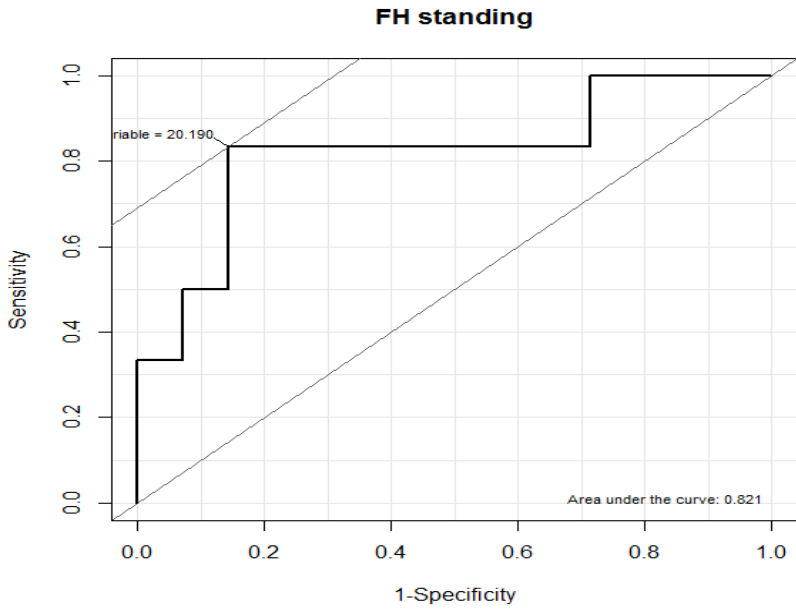
15 cases , 20 levels



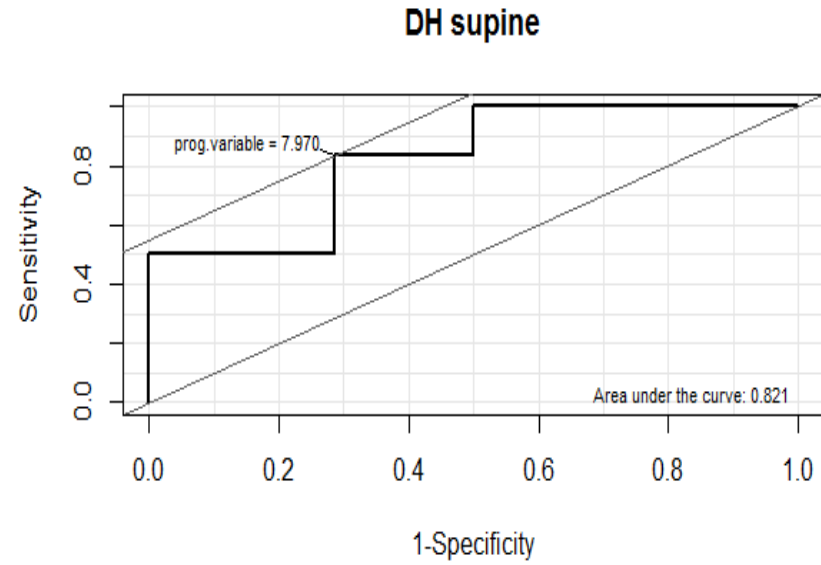
	Preoperative	Postoperative	P-value
Disc height, mm.	7.18 +/- 2.42	12.16 +/- 2.91	<0.001
Foraminal height, mm.	18.98 +/- 3.41	22.97 +/- 3.92	<0.001
Translation, mm.	0.012 +/- 5.02	1.14 +/- 3.49	0.209
SDA , degree	4.8 +/- 4.97	7.35 +/- 5.61	0.0825
Canal diameter mm.	11.23 +/-3.59	13.17 +/- 3.6	<0.001
Canal area, mm ²	141.625 +/- 59.95	170 +/- 64.82	<0.001

Disc height, foraminal height, canal diameter and canal area were significantly difference

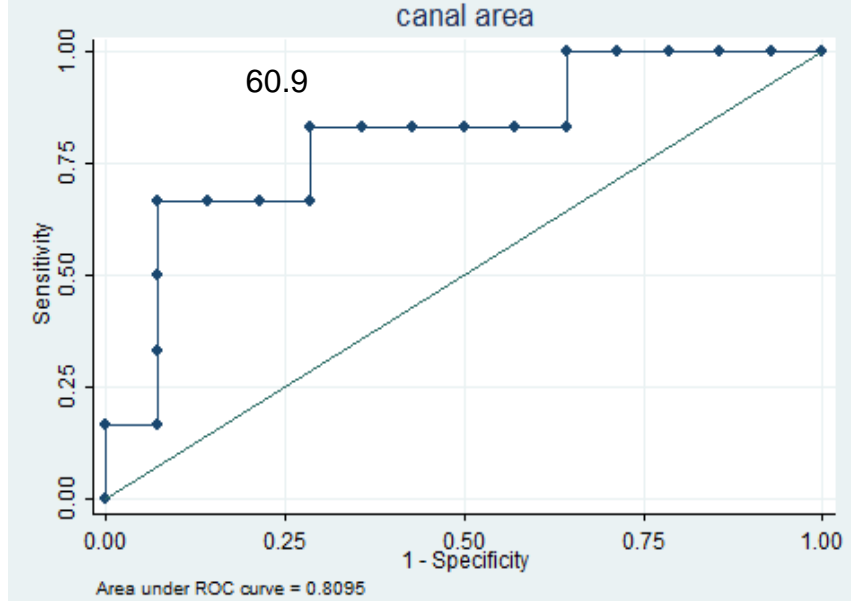
	Successful	Unsuccessful	P-value	95% CI
FH standing	21.55 +/- 2.52	17.89 +/- 3.19	0.044	0.0141-0.9905
DH standing	8.62 +/- 2.56	6.56 +/- 2.15	0.094	-0.695 – 0.8924
TL standing	3.69 +/- 5.61	-1.56 +/- 3.99	0.052	-0.0024 – 0.4885
SDA standing	6 +/- 5.54	4.28 +/- 4.82	0.476	-0.1223 – 0.2621
FH supine	21.59 +/- 2.28	19.35 +/- 3.54	0.183	-0.1279 – 0.6707
DH supine	9.83 +/- 2.41	7.02 +/- 2.10	0.047	0.0080 – 1.1853
TL supine	2.08 +/- 4.18	-1.12 +/- 3.13	0.091	-0.0143 – 0.5606
SDA supine	6.33 +/- 4.13	4.07 +/- 6.03	0.408	-0.1029 – 0.2535
Canal diameter	9.16 +/- 2.55	12.12 +/- 3.67	0.108	-0.5805 – 0.0575
Canal area	97.91 +/- 52.71	160.35 +/- 54.07	0.045	-0.0422 – - 0.004
ΔDH	1.10 +/- 0.9	0.46 +/- 1.69	0.399	-0.3637 – 0.9129
ΔFH	0.04 +/- 2.13	1.46 +/- 1.45	0.116	-1.2733 – 0.1392
ΔTL	1.24 +/- 1.85	0.74 +/- 0.99	0.419	-0.4528 – 1.0891
ΔSDA	0.33 +/- 2.94	0.5 +/- 3.8	0.906	-0.3520 – 0.3120



Sensitivity = 83%
Specificity = 86%



Sensitivity = 83%
Specificity = 71%



Sensitivity = 83%
Specificity = 71%

Conclusions

Foraminal height in standing , disc height in supine and preoperative area of spinal canal area correlate with successful in direct decompression with LLIF

Postoperative disc height , foraminal height , canal diameter and canal area are significantly increase by LLIF

Disclosure

- All authors have nothing to disclose
- The manuscript submitted does not contain information about medical device(s)/drug(s).
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- No relevant financial activities outside the submitted work.