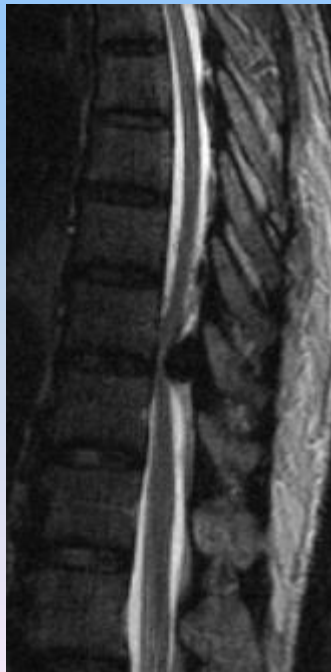


Predictive factors of poor surgical outcome in thoracic ossified ligamentum flavum – An Indian Institutional study



Praburaj Andiperumal Raj,
NIMHANS, Bangalore, India



Introduction

- Dorsal Ossification of ligamentum flavum(OLF/OYL) is a rare disease
- Pathological condition causes slow, progressive myeloradiculopathy
- Common in East Asia
- Surgical decompression is the choice
- Functional prognosis not always favorable
- Predict clinical factors for poor surgical outcome



Methods

- Retrospective study(2003-2015) operated only for dorsal OLF
- Clinical,radiological and post-operative recovery studied
- Minimum follow up was 10 months

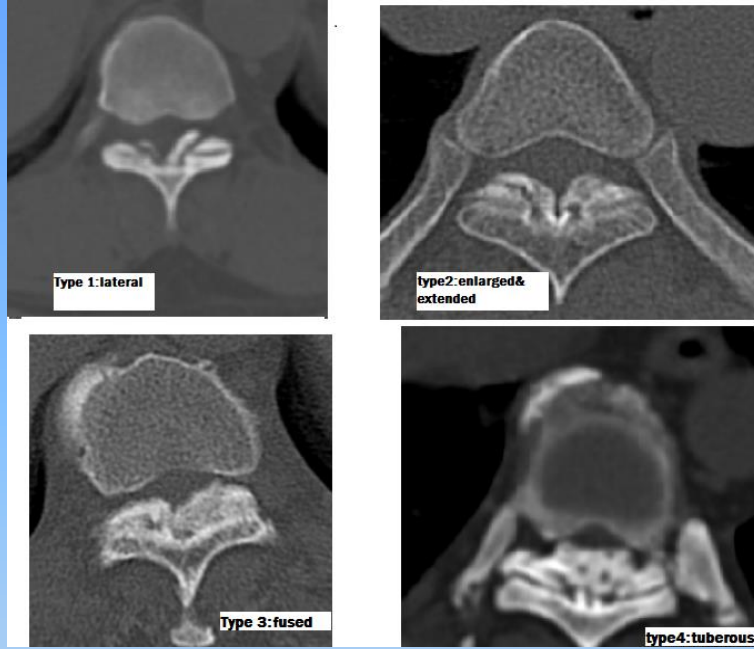
age	Location and levels of OLF
Gender	CT axial classification
Disease duration	Associated OALL
Pre op JOA score	Associated OPLL
Immediate and follow up JOA score	MRI T2 W signal changes
Recovery rate	Dural ossification
Medical comorbidity	Dural tear/leaks

Results

Total no of patients	52
Sex (male : female)	35:17 (67.3%:32.7%)
Mean age	49.54 (range30-75years)
Follow up period	17.84 (range10-72 months)
Disease duration	13.19 (range 1month-5 years)
Medical comorbidity	11(21%)
OLF levels upper(T1-T4)	11(21.2%)
middle(T5-T8)	10(19.2%)
lower(T9-T12)	31(59.6%)
Number of levels involved	1-3:44 >3 :8
MRI T2* signal changes	20(38.5%)

All patients underwent laminectomy alone

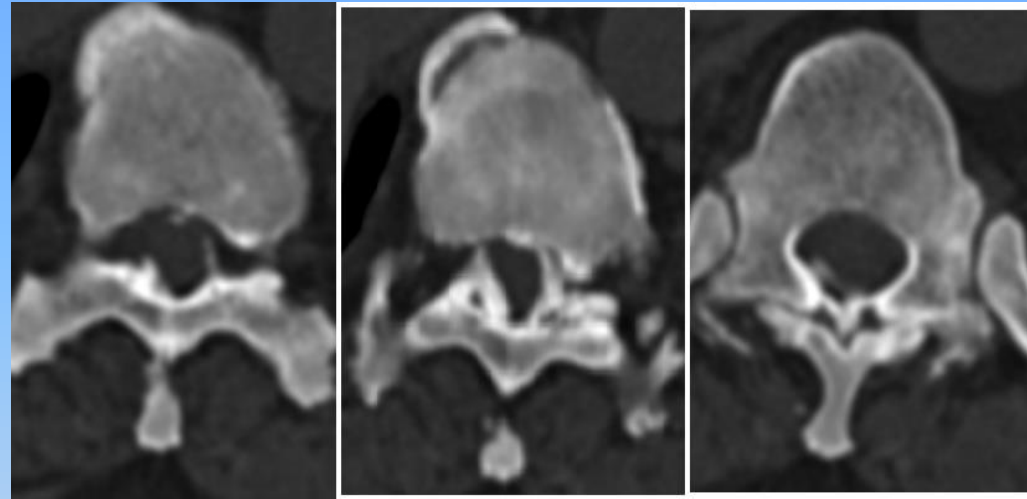
CT axial classification of OLF (Sato' classification)



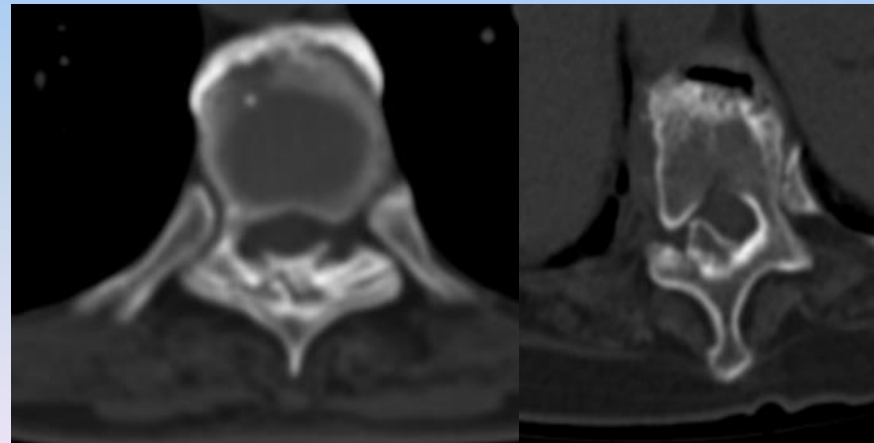
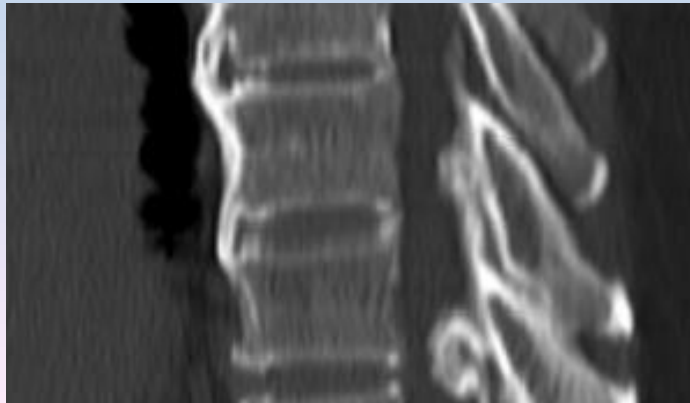
Dural ossification

Intra-op findings of dural ossification-
19(36.5%)

Radiological signs Tram track, comma
sign- 11(21%)



Associated OALL/OPLL



Results cont..

Pre operative JOA score(mean)	5.84(range3-9)
Postoperative JOA score at follow up(mean)	7.46(range4-10)
JOA recovery rate(mean)	30.29(-20-83%)
Dural tear	21(40.4%)
CSF leak	8(15.4%)

Recovery rate	$\frac{\text{PostJOA}-\text{Pre JOA}}{\text{11- pre JOA}} \times 100$
excellent >75%	4(7.6%)
Good >50% <75%	14(26.9%)
Fair >25% <50%	21(40.38)
Poor <25%	3(5.7%)
Unchanged	7(13.4%)
Worse	3(5.7)

Relationship of follow up recovery rate to various patient factors

Parameters	Recovery rate(%) Mean ± std.deviation	P value
Sex Male female	33.57 ± 26.18 20.14 ± 48.05	0.197
Mean age <50 >50	31.25 ± 38.02 28.76 ± 33.09	0.793
Disease duration(months) <6 6-12 >12	30.58 ± 39.67 25.70 ± 27.85 37.08 ± 32.84	0.651
OLF levels Upper Middle lower	41.13 ± 22.89 12.44 ± 45.36 30.34 ± 33.73	0.165
No. of OLF levels <3 >3	35.56 ± 28.27 12.76 ± 41.62	0.061
Medical co morbidity Absent present	28.61 ± 37.02 31.28 ± 27.23	0.825
Pre op JOA score 1-3 4-7 8-11	37.50 ± 0.00 32.09 ± 28.91 13.86 ± 59.99	0.420

parameters	Recovery rate(%) Mean ± std.deviation	P value
CT axial classification		
1.Lateral	46.06 ± 17.01	
2.Extended and enlarged	52.70 ± 24.21	
3.Fused	24.38 ± 41.06	
4.tuberous	8.98 ± 29.43	0.007
Associated OPLL		
Absent	35.60 ± 31.26	
present	13.33 ± 39.48	0.036
Associated OALL		
Absent	38.40 ± 29.80	
present	13.17 ± 38.16	0.011
MRI signal changes		
Absent	36.97 ± 35.97	
present	16.70 ± 30.04	0.041
Ossification of duramater		
Absent	39.47 ± 24.12	
present	11.30 ± 43.54	0.004
Dural tear		
Absent	40.78 ± 23.51	
Present	12.05 ± 42.06	0.003
Csf leak		
Absent	34.41 ± 29.17	
Present	0.416 ± 50.56	0.010

Surgical technique used in dural ossification

	Patients	Recovery rate(%)
Dural ossification	19	11.34
Floating method used	6	49.88
Attempt to remove dural ossification	13	4.18

Relevance of immediate post op JOA score

	Patient deteriorated in immediate post op (n=19)	Improved /unchanged (n=33)
Mean Pre op JOA score	6.05	5.72
Mean Immediate post op JOA	4.26	6.27
Mean Follow up JOA	6.89	7.78
Recovery rate(%)	16.56%	38.20%

DISCUSSION

Comparison from various studies

	MIYAKASHI 2003	LI 2005	TOSHIMI 2006	KEI ANDO 2012	SHUNZHI YU 2013	SANGHVI 2011	PRESENT STUDY 2017
No. of patients	34	40	72	96	78	25	52
Gender	NA	NO	NO	NO	NO	NO	NO
age	NO	NO	NO	YES	NO	NO	NO
Level of olf	NA	NA	NA	NO	YES	NO	NO
No. of OLF	NO	NA	NA	NO	NO	NO	NO
Co existing OPLL	NO	NO	NA	NA	NA	NA	YES
Pre op symptoms duration	YES	NO	NO	YES	YES	YES	NO
Preop JOA	YES	YES	YES	NA	YES	YES	NO
CT axial classification	NO	YES	NA	NO	YES	YES	YES
MRI T2*W signal changes	YES	NO	NA	YES	NA	YES	YES
Dural ossification	NA	NA	NO	YES	NO	NO	YES
OALL association	NA	NA	NA	YES	NA	NA	YES

Summary

- Preoperative prediction of poor outcome are tuberous type OLF, MRI T2*w signal changes, associated OPLL/OALL.
- Intraop poor outcome predictors are dural ossification, dural tear and CSF leak.
- There is no association with age, gender, disease duration, pre operative JOA score, OLF level, number of OLF level, and medical co morbidity.
- Floating technique gives better outcome compared to removal of ossified dura and repair.
- Patient improves with rehabilitation inspite of the immediate post-operative deterioration.
- Long term follow up required to know the natural history of the disease.

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Disclosure: NIL

Thank you