

The Clinical Importance of Posterior Vertebral Height Loss in Vertebral Fracture

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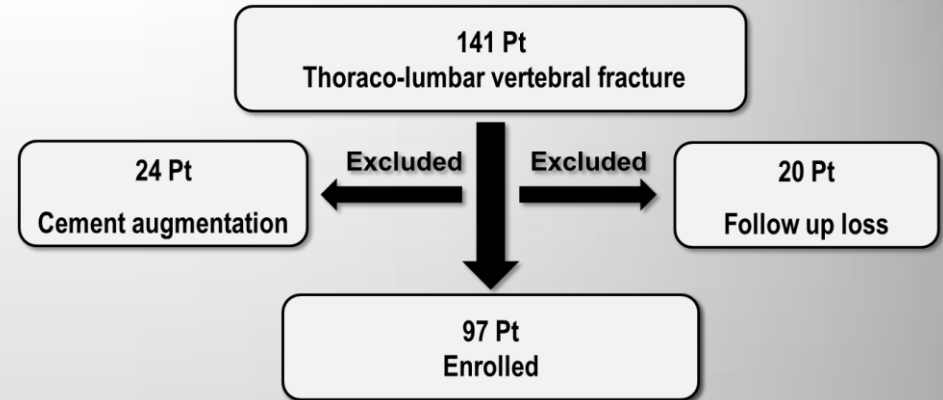
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Purpose

To investigate the clinical importance of posterior vertebral height loss, the indicator of progressive collapse of fractured vertebra

Methods

- Retrospective study
- 2010. 6. 1 ~ 2012. 1. 31
- 97 Pt. (M:15, F:82)
- Mean age: 70.25±14.6
- Conservative Tx.
- Inclusion Criteria
 - Anterior and middle column injury
- Exclusion Criteria
 - Other causes of pathologic fracture (Infection, Tumor)
 - Posterior column injury
 - Unstable fracture



Level	Pt
T10	2
T11	3
T12	31
L1	49
L2	7
L3	3
L4	2

Methods

Treatment protocol

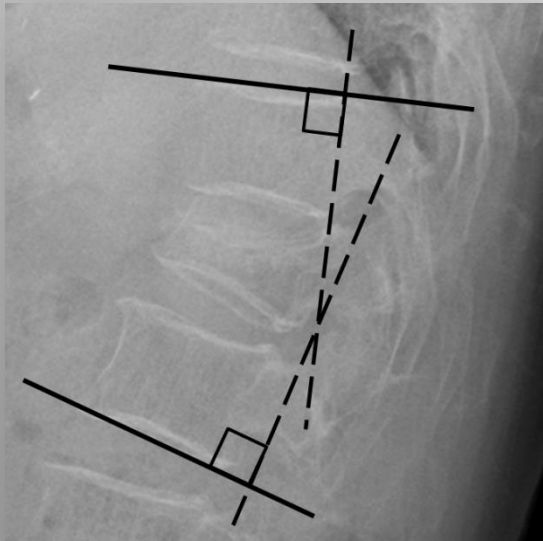
- **2 weeks of absolute bed rest**
- **After 2 weeks, tolerable ambulation permitted in wearing custom molded brace (LSO or TLSO)**
- **Keeping brace after 2 weeks to 3 months**

Methods

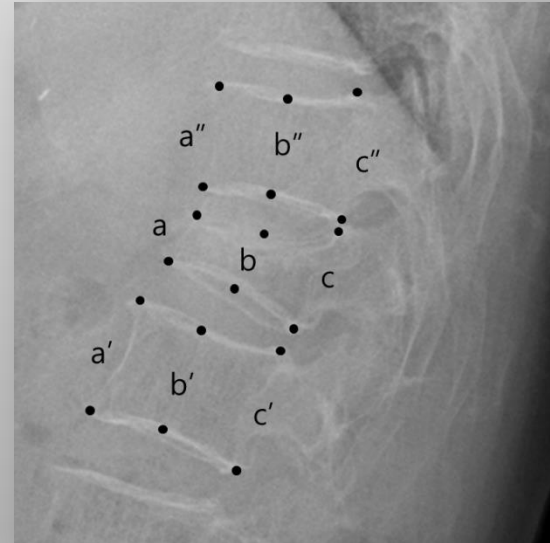
Plain x-ray : Initial, 2wks, 4wks, 6wks, 12wks

Kyphotic angle

(Cobb method)



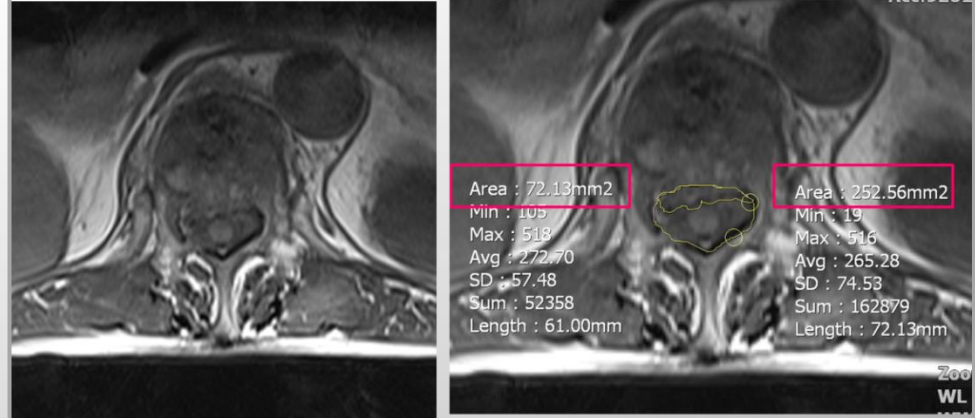
Vertebral height



$$\text{Posterior height loss(\%)} = \left\{ \frac{[(c' + c'')/2 - c]}{[(c' + c'')/2]} \right\} \times 100$$

Methods

Canal Encroachment (%)



$$72.13/252.56 \times 100 = 28.6\%$$

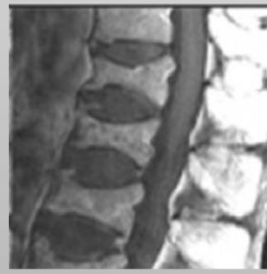
MRI findings



Type I



Type II



Type III



Type IV



End plate type



Mid portion type

Results

Initial MRI Findings

Mid portion	69 (71%)
End plate	28 (29%)

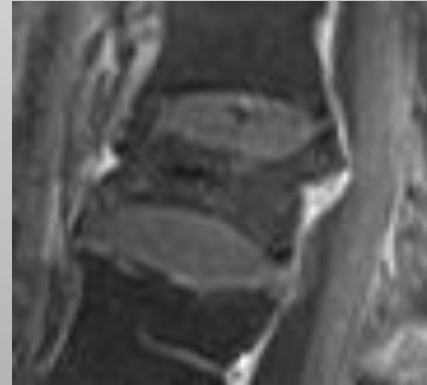
Type I	16 (17%)
Type II	68 (70%)
Type III	13 (13%)



**Type II
Mid portion**



**Type II
End plate**



**Type III
Mid portion**



**Type III
Mid portion**

Results

	Initial	3 M
Kyphotic Angle (°)	12.6°±8.9°	19.2°±12.7°
Anterior Height Loss (%)	25.2±3.5%	35.3±12.4%
Posterior Height Loss (%)	7.78±2.1%	15.32±7.5%
Canal Encroachment (%)	11.79±4.9%	15.3±7.6%

- During the follow-up period, significant posterior height loss was noticed in 32 patients.
- CT or MRI was performed to evaluate canal encroachment.

Results

Correlation Analysis

Spearman rho (correlation coefficient)

R(p-value)

N=32

	$\Delta KA_{(I-3M)} (^{\circ})$	$\Delta AHL_{(I-3M)} (\%)$	$\Delta PHL_{(I-3M)} (\%)$	$\Delta CE_{(I-3M)} (\%)$
$\Delta KA_{(I-3M)} (^{\circ})$	1.00(.)			
$\Delta AHL_{(I-3M)} (\%)$	0.46(0.01)	1.00(.)		
$\Delta PHL_{(I-3M)} (\%)$	0.24(0.15)	0.18(0.73)	1.00(.)	
$\Delta CE_{(I-3M)} (\%)$	0.34(0.07)	0.47(0.06)	0.51(0.001)	1.00(.)

Results

Neurologic complication was found in 4 patients.

Case	Level	KA(I)	KA(3M)	PHL(I)	PHL(3M)	CE(I)	CE(3M)	MRI	From Accident to Neurologic Sx.	Neurologic Sx.
1	T12	12.4	28.15	5.6	25.3	10.5	32.6	Type III	3 Months	Frankel D
2	T12	17.2	19.2	27	31.1	23.5	42.3	Type III	20 days	Frankel C
3	L1	13	19.8	8.8	28.9	18.9	38.2	Type III	2 months	Conus medullaris syndrome
4	L1	10.2	20	1.5	24	5.6	28.6	Type III	3 months	Lt. hip weakness (grade 1)

KA : Kyphotic angle(°)

PHL : Posterior Height loss(%)

CE : Canal Encroachment(%)

I : Initial(at first visit)

3M : Follow up 3 months

Sx. : Symptom

Conclusions

- In thoraco-lumbar vertebral fractures, the posterior vertebral body height loss was important finding during follow up period, which followed by spinal canal encroachment.
- In patients with simple compression fracture, great attention to the loss of posterior vertebral height should be paid to detect the spinal canal compromise which could be followed by devastating result.

None of the authors has any potential conflict of interest