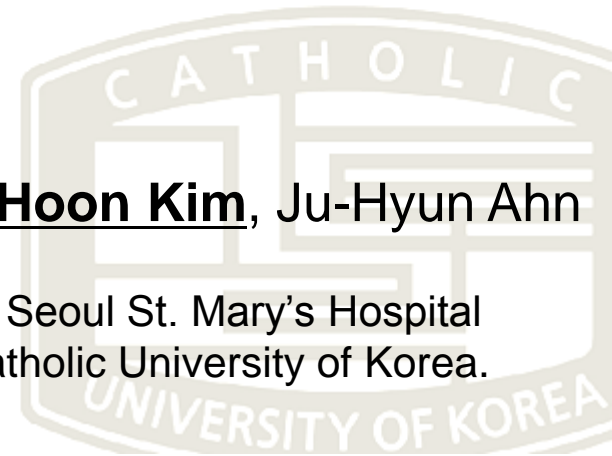


Risk factors affecting progressive collapse of acute osteoporotic spinal fracture

Kee-Yong Ha, Young-Hoon Kim, Ju-Hyun Ahn

Department of Orthopedics, Seoul St. Mary's Hospital
College of Medicine, The Catholic University of Korea.



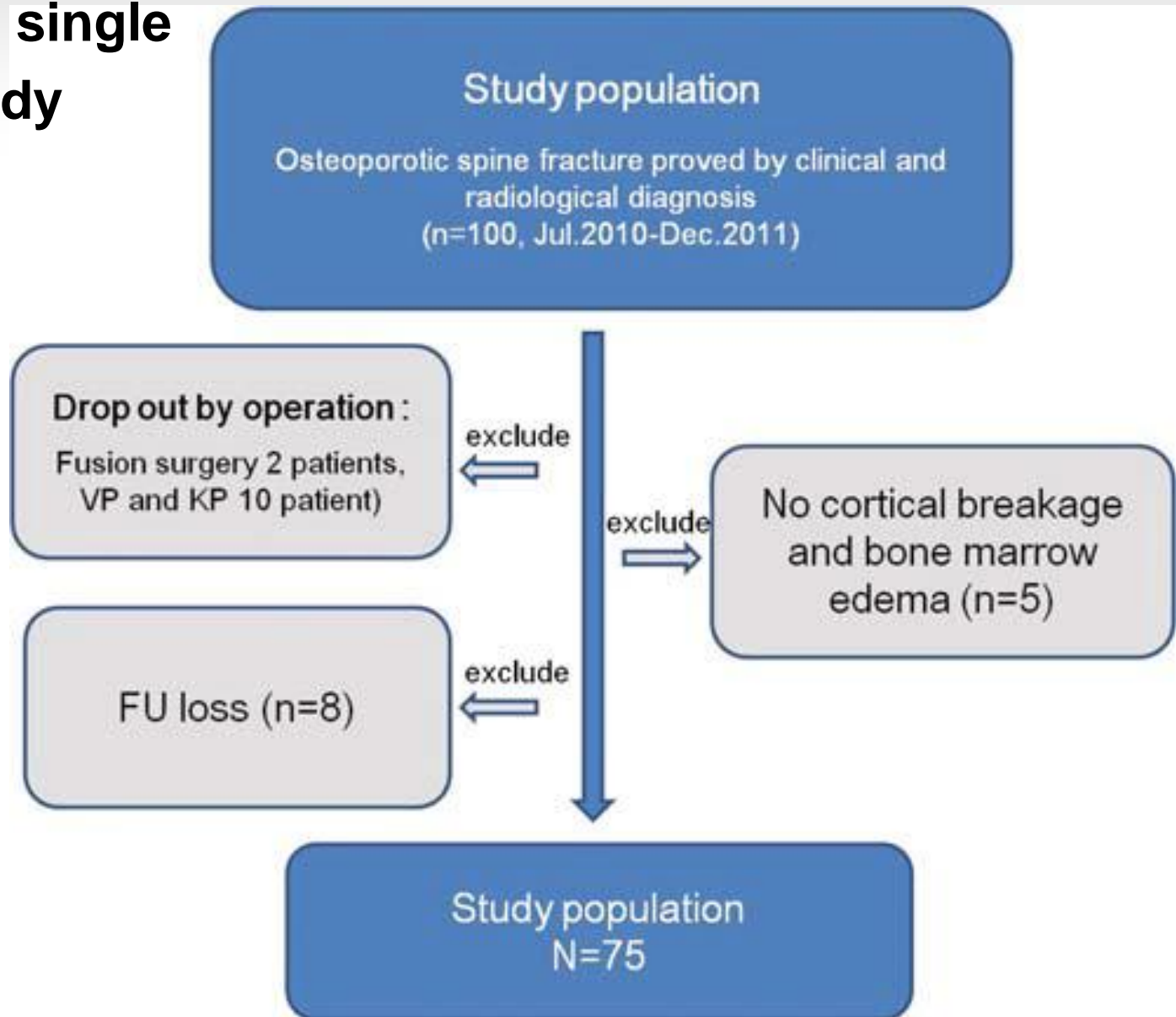
Aim

Which clinical and radiological factors are related to the progressive collapse following acute OSF?



Materials and Methods

**Prospective single
institute study**



Materials and Methods

Assessments

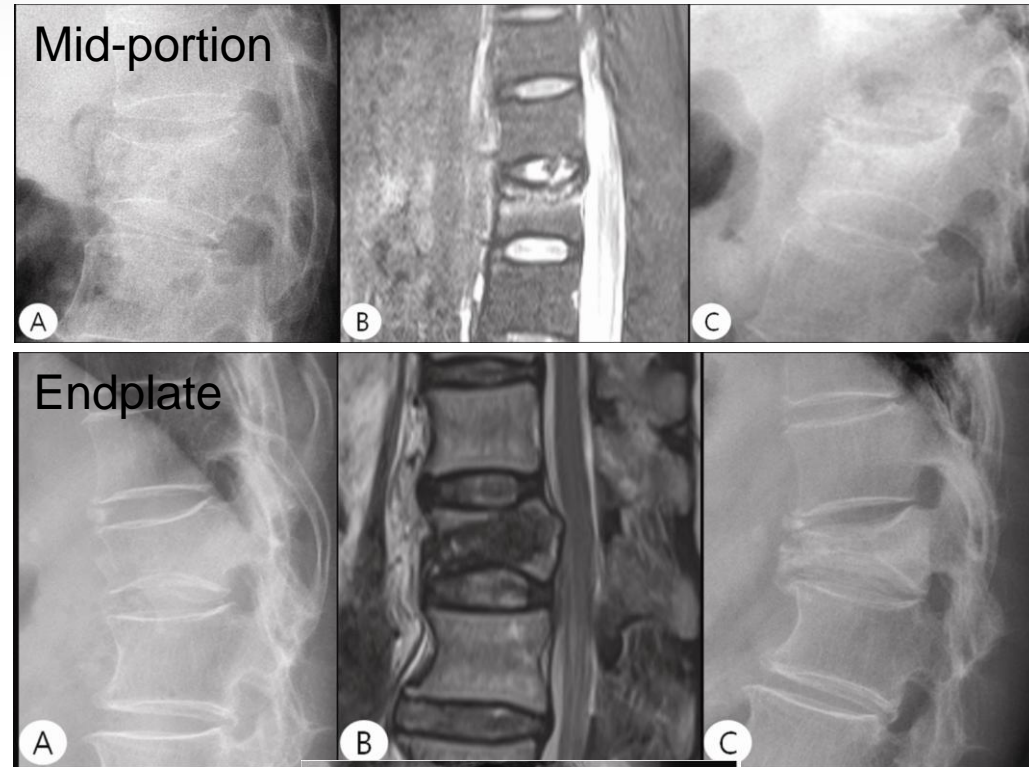
<Clinical data>

- Age
- Sex
- Body mass index (BMI)
- Fracture level
- History of previous OSF
- VAS
- RMDQ

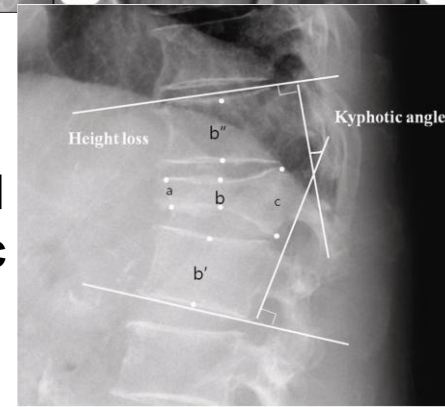
<Radiological data>

- Fracture level
- **Fracture morphological type**
- Involvement of posterior wall
- Height loss
- Local kyphotic angle

Fracture morphological type



Height loss and kyphotic angle



Materials and Methods

Definition of progressive OSF

- 1) Progression of height loss($\geq 15\%$) between initial and 6 months follow-up
- 2) Progression of local kyphotic angle ($\geq 10^\circ$) between initial and 6 months follow-up
- 3) Presence of IVC during follow-up

Statistical analysis

T-test for comparison between groups.

Logistic regression analysis for relative risk analysis.

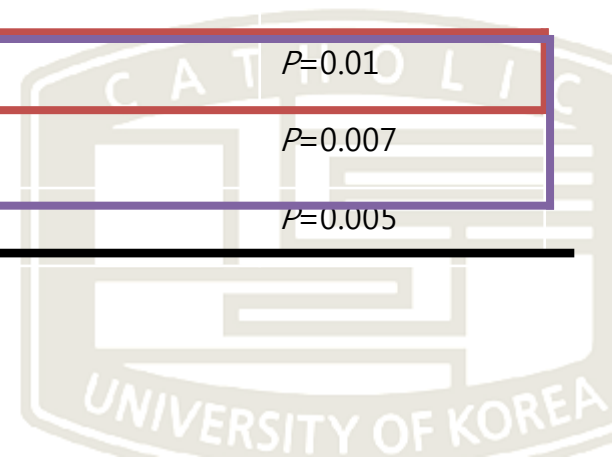
SAS 9.2



Results

I. Height loss >15%

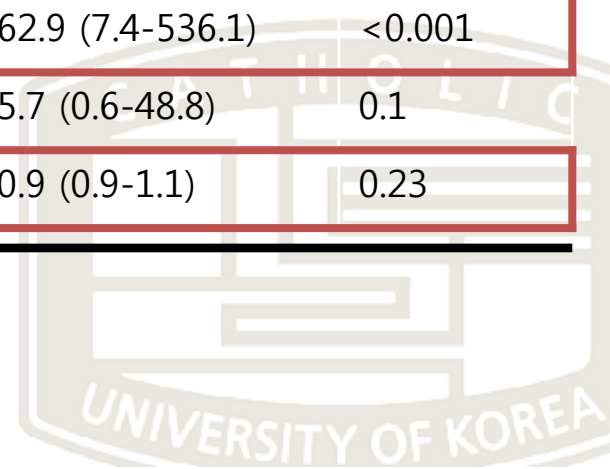
	HL change \geq 15 % (<i>N</i> =27)	HL change < 15 % (<i>N</i> =48)	Statistical significance
Age	73.2 \pm 6.4	69.1 \pm 8.9	NS
BMD	-3.8 \pm 0.6	-3.7 \pm 0.8	NS
BMI	24.6 \pm 2.2	24.4 \pm 3.4	NS
Location (TL junction)	19 (70 %)	31 (65 %)	NS
Fracture type (mid-portion)	10 (37 %)	1 (0.02 %)	<i>P</i> <0.001
Posterior wall involvement	16 (59 %)	1 (0.02 %)	<i>P</i> <0.001
Previous OSF	5 (19 %)	8 (16 %)	NS
Initial HL	27.7 \pm 11.5	20.1 \pm 11.4	<i>P</i> =0.01
Last VAS	4.6 \pm 1.4	3.8 \pm 0.7	<i>P</i> =0.007
Last RMDQ	11.3 \pm 3.8	8.8 \pm 2.4	<i>P</i> =0.005



Results

I. Height loss >15%

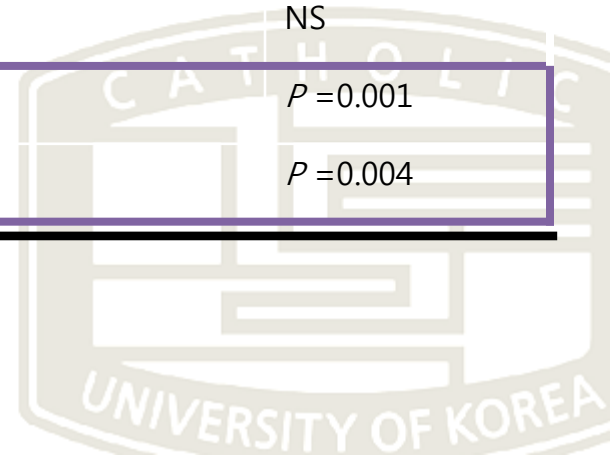
	Univariate analysis		Multivariate analysis	
	OR (95 % CI)	P value	OR (95 % CI)	P value
Location (TL junction)	1.4 (0.5-4.1)	0.53	1.3 (1.4-4.5)	0.55
Fracture type (mid-portion)	28.7 (3.4-242.6)	0.002	16.3 (1.1-225.4)	<0.05
Posterior wall involvement	73.6 (8.7-620.1)	<0.001	62.9 (7.4-536.1)	<0.001
Previous OSF	1.2 (0.3-3.9)	0.81	5.7 (0.6-48.8)	0.1
Initial HL	1.1 (1.0-1.1)	0.01	0.9 (0.9-1.1)	0.23



Results

II. Kyphotic angle > 10 °

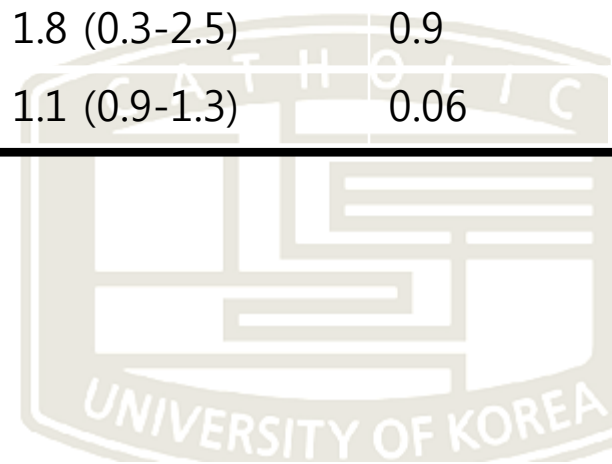
	KA change $\geq 10^\circ$ ($N=20$)	KA change < 10 ° ($N=55$)	Statistical significance
Age	73.4 \pm 6.4	69.1 \pm 8.6	NS
BMD	-3.9 \pm 0.6	-3.6 \pm 0.8	NS
BMI	24.4 \pm 3.2	24.4 \pm 2.8	NS
Location (TL junction)	16 (80 %)	34 (61 %)	NS
Fracture type (mid-portion)	8 (40 %)	3 (5 %)	$P < 0.001$
Posterior wall involvement	14 (70 %)	3 (5 %)	$P < 0.001$
Previous OSF	5	8	NS
Initial KA(°)	12.6 \pm 7.65	10.2 \pm 7.6	NS
Last VAS	5.1 \pm 1.4	3.8 \pm 0.7	$P = 0.001$
Last RMDQ	12.0 \pm 4.1	8.9 \pm 2.4	$P = 0.004$



Results

II. Kyphotic angle > 10 °

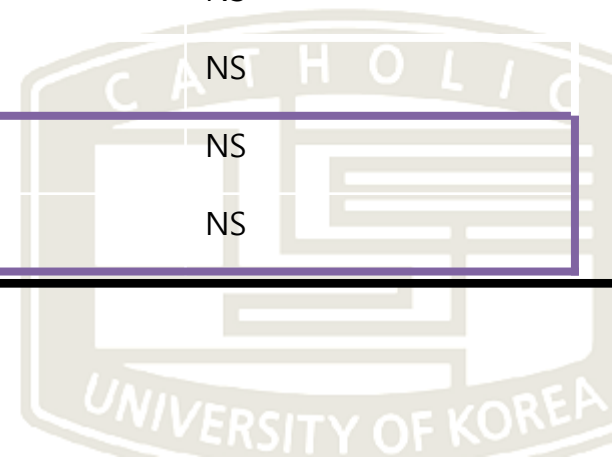
	Univariate analysis		Multivariate analysis	
	OR (95 % CI)	P value	OR (95 % CI)	P value
Location (TL junction)	3.1 (0.8-12.1)	0.04	0.2 (0.05-1.6)	0.28
Fracture type (mid-portion)	12.4 (2.8-54.2)	<0.001	4.2 (5.7-31.4)	<0.001
Posterior wall involvement	47.6 (10.1-223.9)	<0.001	9.4 (5.1-35.9)	<0.001
Previous OSF	2.1 (0.5-7.3)	0.2	1.8 (0.3-2.5)	0.9
Initial KA	1.04 (0.9-1.1)	0.2	1.1 (0.9-1.3)	0.06



Results

III. The presence of IVC

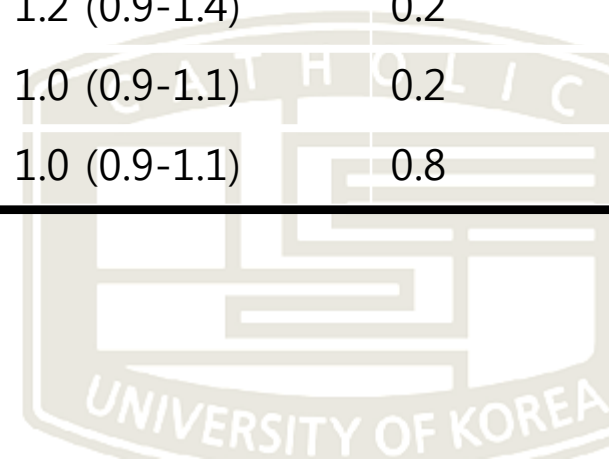
	IVC+ (N=21)	IVC- (N=54)	Statistical significance
Age	71.3 ± 5.8	69.8 ± 9.0	NS
BMD	-3.9 ± 0.8	-3.6 ± 0.7	NS
BMI	24.2 ± 3.2	24.6 ± 2.9	NS
Location (TL junction)	17 (80 %)	7 (13 %)	<i>P</i> <0.05
Fracture type (mid-portion)	4 (19 %)	7 (13 %)	NS
Posterior wall involvement	7 (33 %)	10 (19 %)	NS
Previous OSF	2	11	NS
Initial KA(°)	13.2 ± 7.9	9.9 ± 7.3	NS
Initial HL (%)	26.8 ± 11.7	21.3 ± 11.8	NS
Last VAS	4.1 ± 1.4	3.7 ± 1.1	NS
Last RMDQ	11.1 ± 4.2	9.1 ± 2.4	NS



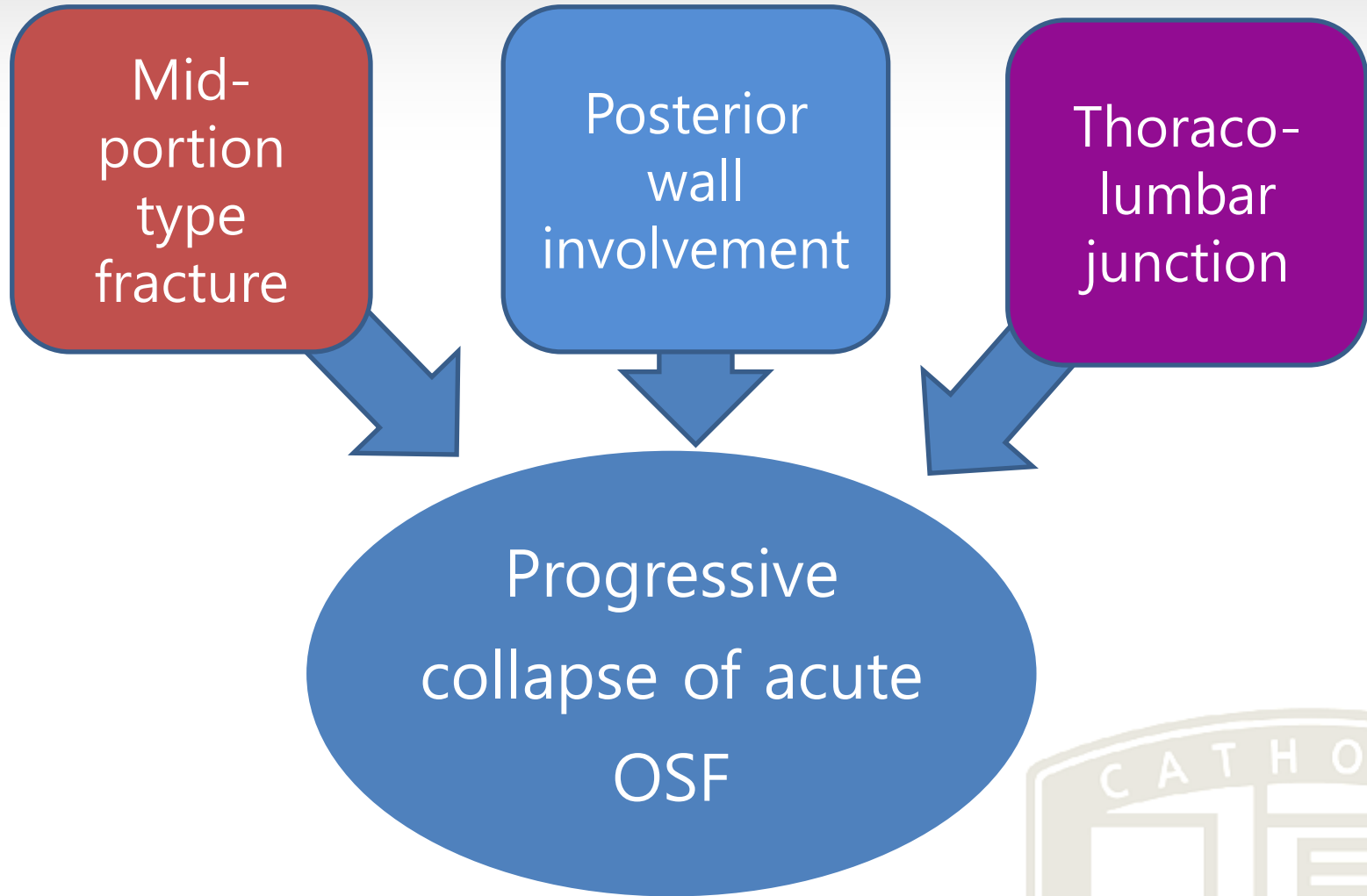
Results

III. The presence of IVC

	Univariate analysis		Multivariate analysis	
	OR (95 % CI)	P value	OR (95 % CI)	P value
Location (TL junction)	3.4 (0.8-13.2)	0.05	3.2 (0.6-17.6)	<0.05
Fracture type (mid-portion)	1.6 (0.4-6.4)	0.47	2.1 (0.4-9.1)	0.3
Posterior wall involvement	2.3 (0.7-7.3)	0.15	1.3 (0.1-3.8)	0.7
Previous OSF	0.4 (0.1-2.1)	0.29	1.2 (0.9-1.4)	0.2
Initial HL	1.0 (0.9-1.9)	0.08	1.0 (0.9-1.1)	0.2
Initial KA	1.1 (0.9-1.1)	0.1	1.0 (0.9-1.1)	0.8



Conclusion



More attentions during conservative management of OSF should be paid to the patients with these risk factors.



Acknowledgments

This study is partially supported by research grant of Dae-woong Pharmacy Co.

No other funds or benefits in any form have been or will be received from a commercial party related directly or indirectly to the subject of this study.

