Injury of Posterior Ligament Complex with Cervical Spine Fracture

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– Abstract –

Objective : To define the clinical and radiological characteristics of the patients with injury of the posterior ligament complex of the cervical spine using MR imaging.

Materials and Methods : Forty patients with acute cervical spine fracture who underwent surgery were examined with MR imaging and plain radiography. Twenty- five patients underwent posterior fusion. The MR findings were correlated with surgical findings, clinical findings, and plain radiographs.

Results : Posterior ligament complex injury was detected in 75% (n=30) of all patients. Of the 20 patients with distractive- flexion injury, 90%(n=18) had posterior ligament complex injury (p<0.05). Of the 15 patients with compressive- flexion injury, 73% (n=11) had ligament injury. Of the 4 patients with vertical compression injury, 1 patient (25%) showed ligament injury. One patient with distractive- extension injury did not show ligament injury. Of the 23 patients with complete spinal cord injury, 96% (n=22) showed ligament tear (p<0.05). Of the 17 patients without complete cord injury (15 incomplete injury, 2 no cord injury), 47% (n=8) had ligament injury. Surgical findings were well correlated with MR imaging in patients who underwent posterior surgery (p<0.05).

Conclusions : Injury of the posterior ligament complex in patients with cervical spine fracture was most common in patients with distractive- flexion injury and was more frequent with complete cord injury. MR imaging could reliably reveal such injuries.

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Key Words : Cervical spine, Fracture, Posterior ligament complex, MRI

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kee, WI, 12-inch surface coil)

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(supraspinous ligament), (interspinous
ligament), (facet joint capsule)
(ligamentum flavum)
(posterior ligament complex; PLC) , .

15 , 11 , . 14

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. Allen 40

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40 24 (60%)

, 19 (47.5%)

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- 20 18 (90%) , - 15

11 (73%) , - 4 1 (25%)

1995 3 2000 2

40 Allen (Table 1).

, 23 22 (96%)

25 , 17 8 (47%)

(Table 2).

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40.5(19~81) , 20

, 18 , 2 . 23 (57.5%) 90%, 100%,

, 15 (37.5%) 100%, 67%, 92% .

, 2 (5%)

Table 1. Types and Number of Fractures by Allen Classification in Patients with and without PLC injury   (p<0.05)

Type	No. of cases	PLC* injury	
		(+)(%)	(-)
Distractive flexion	20	18(90)	2
Compressive flexion	15	11(73)	4
Vertical compression	4	1(25)	3
Distractive extension	1	0(0)	1

*PLC : posterion ligament coplex

Table 2. Relation of number of cases between posterior ligament complex injury and spinal cord injury   (p<0.05)

Cord injury	Posterior ligament Complex injury	
	(+)	(-)
Complete	22	1
Incomplete	8	9

Table 3. Accuracy of MRI in detecting posterior ligament complex injury

Ligament	MRI		Op findings		Sensi-tivity (%)	Speci-ficity (%)	Positive PV(%)	Negative PV(%)	Accuracy (%)
	+	-	+	-					
Posterior ligament complex	22	1	24	1	92	100	100	33	92
Supraspinous	19	1	21	1	90	100	100	67	92
Interspinous	20	4	21	4	95	100	100	80	96
Ligament flavum	15	8	17	8	88	100	100	80	92
Facet joint capsule	12	9	15	10	80	90	92	75	84

*PV : predict value

95%,   100%,   ,   ,   ,
100%,   80%,   96%   .   ,   ,
          88%,   100%,   ,   .
100%,   80%,   92%   .
          80%,   90%,   (supraspinal ligament),   (interspinal ligament),
    92%,   75%,   84%   .   (facet joint capsule),   (ligamentum
                      80%   flavum)   .
90%   ,   3

                              Allen

                      92%,   ,   ,   ,   ,
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REFERENCES

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87%   .   ,

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95%   100%

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(84%)

80%   90%

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52%   66.7%

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66.7%   , 66.7%   ,

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        :   40   75%(30   )   ,   -   20   90%(18

)   ,   -   15   73%(11   )   ,   -   4

25 %(1   )   ,   -   .   23   96%(22   )

                                    ,   17   (15   , 2

) 47%(8   )   .   .   25

                (p<0.05).

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