

159명의 골다공증성 흉추 및 요추부 골다공증성 추체 압박골절 환자에 대한 경피적 척추성형술 후 치료결과*

가

이제언 · 류경식 · 박춘근 · 최영근 · 박춘근 · 지 철 · 조정석 · 강준기

= Abstract =

Percutaneous Polymethylmethacrylate Vertebroplasty in the Treatment of Osteoporotic Thoracic and Lumbar Vertebral Body Compression Fractures : Outcome of 159 Patients

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Purpose : To assess therapeutic effects of percutaneous polymethylmethacrylate (PMMA) vertebroplasty on the pain caused by osteoporotic thoracic and lumbar vertebral body compression fractures in a large scale of a prospective clinical design, and to determine clinical factors influencing its therapeutic effects.

Methods : A prospective clinical study was carried out in 349 vertebral levels of 159 patients between April 1998 and July 1999. The compression fractures were confirmed with bone scan and spine CT, and bone marrow density was measured. Visual analogue scale (VAS) score was used for pre- and post-operative assessments of the pain. All 159 patients were assessed immediately after surgery, and 140 patients of them were followed-up for about 6 months in average.

Results : Partial and complete pain relief was sustained immediately after operation in 73%, through follow-up period in 88% of the patients. Pain relief was not proportional to the amount of PMMA or the rate of increase in the height of the compressed vertebral body. It appears that 3 to 6cc of PMMA was proper enough to sustain pain relief. Better clinical improvement was achieved in the patients treated within 6 months after occurrence of vertebral body fracture. The most frequent surgical complication was epidural leakage of PMMA, and the most serious complication was extravertebral leakage into the paravertebral muscles, which appeared to exert the worst influence on the outcome. However, surgery was not required in these patients.

Conclusion : Therapeutic effects of PMMA percutaneous vertebroplasty on osteoporotic vertebral body compression fractures were confirmed in a relatively large scale of prospective clinical study. It appears that good outcome can be achieved in patients treated within 6 months after fracture, treated each level with 3 to 6cc of PMMA in amount. without serious complications.

KEY WORDS : Vertebroplasty · Polymethylmethacrylate · Osteoporosis · Spine fracture · Complications · Outcome.

서 론

1987 Galivert

7)9)13),

가

8)10),

1998 4 1999 159

6 Polymethylmethacrylate(PMMA)

대상 및 방법

protocol

가

가

1 CT 가

X- 가 50%

CT MRI, 가 84.8%

VAS(visual analogue scale) FS(facial scale)

10), 7.04

CT PMMA

X-

PMMA 가 'good' 'fair'

VAS FS (1) (3

1 ; 6.3)

159

3

1 4 6 140

VAS

FS '10' '4'

'good', '4' '6'

'fair', '6'

'poor'

5)

10)

C-arm

11G Ja-

가 mshidi

PMMA 3cc soup (visco-

sity)

PMMA

PMMA

Chi-square

p<0.05

결과

가 41 90 61 80 가 81%

t-score -3.324

X-

가 50%

가 84.8%

가 6.63 10.0

7.04

1 VAS

가 159 116 , 72.9%

Table 1. Distribution of postoperative outcome.

Assessing time	outcome(%)		
	Good	Fair	Poor
Immediate(n=159)	21(13.2)	95(59.7)	43(27.1)
Late(n=140)	63(46.3)	59(42.1)	18(12.9)

가 140 122
 87.1%
 가가 'good' 13.2%
 46.3% 가 (Table 1).

6 가
 (Table 4 ; Chi - square test, p=0.013).

PMMA
 (unipedicular)
 (bipedicular)

가 PMMA 3cc
 3 6cc 6cc 가
 (Table 2, 3).

Table 2. Late outcome related to the injection site.

Site	Outcome(%)			Total
	Poor	Good	Fair	
Unilateral	10(58.8)	6(35.3)	1(14.9)	17
Bilateral	41(44.5)	39(42.4)	12(13.1)	92
Mixed	12(38.7)	14(45.2)	5(16.1)	31
Total	63	59	18	140

Table 3. Outcome related to the interval between accident and vertebroplasty(Chi-square test : p=0.013)

interval	Outcome(%)			Total
	Good	Fair	Poor	
<1month	11	3		14
<3month	4	6		10
<6month	8	13		21
<1yr	10	12	2	24
<2yr	6	4	2	12
<3yr	15	28	6	40
Total	54	57	10	121*

*Remaining 38 patients did not remember the accident date.

Table 4. Late outcome related to the amount of PMMA

Amount	Outcome(%)			Total
	Good	Fair	Poor	
<3cc	39(35.5)	61(55.5)	10(9.0)	110
3.1 - 6cc	63(40.6)	82(52.9)	10(6.5)	155
>6cc	9(31.0)	16(55.2)	4(13.8)	29

PMMA
 3 6cc
 'good' 가가 'poor' 가가

가가 48 93% 45
 50% 가
 가 48 85.4% 가
 140 87.1%

가가 (Table 5).

60 , 37.7% PMMA
 49 가 , PMMA
 9 , PMMA 2

(Table 6,
 7) 'poor' 가 33.3%
 6.7%

Table 5. Late outcome related to increase in the body height following vertebroplasty

Increased rate(%)	Outcome(%)			Total*
	Good	Fair	Poor	
<25	3	17	7	27
<50	3	15		18
<75		1		1
<100				
>100		2		2
Total	6	35	7	48

*In remaining 92 cases, there was no change in the height of vertebral body following vertebroplasty.

Table 6. Immediate outcome related to intraoperative complications caused by PMMA

Complication	Outcome(%)			Total
	Good	Fair	Poor	
Epidural leakage	4	28	17	49
Extravertebral leakage		6	3	9
Drain into vein		2		2

Table 7. Late outcome related to intraoperative complications

Complication	Outcome(%)			Total
	Good	Fair	Poor	
Epidural leakage	20	27	2	49
Extravertebral leakage	4	3	2	9
Drain into vein	1	1		2



Fig 1. Postoperative axial computed tomograph showing leakage of PMMA into the paravertebral psoas muscles (arrow).

PMMA
'poor' 22.2%

(Fig. 1).

고 찰

159

87.1%

6

가 VAS

VAS 가 가 , VAS
 가 VAS
 가 PMMA 가
 , PMMA 가
 Tohmes 12)
 6cc
 10cc PMMA
 PMMA
 PMMA 가
 PMMA

PMMA

Tohmeh 12)
 6cc 10cc

가 Cotten

4)

PMMA

PMMA 3 6cc

3cc 6cc 가 가 3
 6cc 'good' 가 가

'poor' 가 가
 가 PMMA 가 3cc
 PMMA 가

가 PMMA 가

PMMA

PMMA가

가

PMMA

가

PMMA

가

PMMA

30.8%

PMMA

PMMA

Cotten ⁴⁾ 2

(osteo-inductive growth factors),
(hydroxyapatite product)
(bone mineral substitute)

1)

가

basivertebral foramina

2)

PMMA

5)6)9)13)

PMMA

PMMA

PMMA

PMMA가

가

PMMA

11)

PMMA

가

PMMA

가

PMMA가

가

PMMA가

2

2

(Table 6, 7) PMMA polymerization

가

polyme-

PMMA

PMMA

PMMA

PMMA

PMMA가

basivertebral foramina

3)

3

가

가

가

가

Table 6 7

' poor '

PMMA가 psoas muscle

PMMA가 polymerization

가
 가
 PMMA
 . Gangi 6)
 CT
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 PMMA
 CT
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 PMMA
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 communication).
 PMMA
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 결론
 1998 4 1999 9
 159
 PMMA
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 6
 가 가 , PMMA
 3 6cc

PMMA
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 137 - 040 505
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 : 02) 590 - 1343, : 02) 594 - 4248
 E - mail : ckpmd@cmc.cuk.ac.kr

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