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Anterior Debridement and Strut Graft with Pedicle Screw Fixation for Tuberculous Spondylitis

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– Abstract –

Study Design: This is a retrospective study

Objective: We analyzed the clinical and radiographic results of surgical treatment for patients with tuberculous spondylitis.

Material and Methods: Our study included 18 active tuberculous spondylitis patients (12 males and 6 females) who underwent anterior curettage, strut bone grafting and posterior instrumentation. Their average age was 50.1 years (age range: 24- 76 years). The mean follow-up was 43 months. Vertebral bodies from T5 to L5 were involved. The anterior column support was iliac autograft in 10 patients and titanium mesh in 4. All the patients had transpedicular instrumentation with an additional hook in 3 and anterior instrumentation in 1. Except for one paraplegic patient, all the others were able to ambulate wearing TLSO. The mean duration of Anti-Tbc medication was 13.3 months (range: 12 to 18 months). The clinical and radiographic results were analyzed, and they included the segmental kyphotic angle and the complications of instrumentation on the involved vertebrae.

Result: The subjective satisfaction was greater than good except for 2 patients. These 2 patients' satisfaction was fair due to incomplete neurologic recovery and persistent BG- donor site pain. The three paraplegic patients fully recovered postoperatively. The mean correction of the segmental kyphosis was 13 °. The mean correction loss was 0.7 ° at the final follow-up. Pedicle screws were inserted in the involved vertebrae for 10 patients (n = 30). There was no loosening of instrumentation nor spread or recurrence of infection. One case was complicated by pneumonia.

Conclusion: For the surgical treatment of active tuberculous spondylitis, anterior column support with strut grafting and posterior instrumentation is mandatory in the destabilized spine after anterior debridement or the correction of kyphosis.

Key Words: Active tuberculous spondylitis, Anterior strut graft, Pedicle screw fixation

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Table 1. Patients profile

Case	Sex/Age	Implant		Involved site	Involve vertebrae	kyphosis (degree)			Neurologic grade (Frankel)		Follow-up (month)
		Anterior	Posterior			Preop	Postop	Final	Preop	Follow-up	
1	51/F		PS [#]	L2	1	-8	-23	-18	B	D	24
2	33/M	Mesh	PS	T7,8,10,L2	4	13	7	9	C	E	38
3	62/F		PS	T11,L2	2	1	0	0	D	E	40
4	51/M		PS	L2,3,4	3	-4	-17	-15	E	D	49
5	68/M		PS	T10,L2	2	10	0	2	C	E	28
6	48/M		PS	T7,8,12	3	37	28	29	C	E	24
7	59/M	Mesh	PS	T6,7	2	29	10	10	C	D	49
8	48/F	Mesh	PS	L4	1	-7	-15	-11	C	E	56
9	50/M		PS	L3,4	2	-5	-10	-8	C	D	58
10	24/M		PS	T8,9	2	20	6	6	C	D	49
11	76/F		PS	T11,L2	2	13	0	3	C	D	35
12	62/M	Mesh	PS	T12,L2	2	15	2	6	C	E	18
13	65/F		PS	T10,L1	2	20	2	3	E	D	49
14	29/M		PS	L3,4	2	3	0	2	C	E	78
15	47/F		PS	L3,4	2	4	0	0	C	E	106
16	54/M		PS	T12,L1	2	7	0	0	C	E	72
17	30/M		PS	T11,L1,2	3	40	2	6	D	E	68
18	45/M		PS	L3,4	2	30	-1	-2	C	D	61

PS[#] : Pedicle Screw

18 2 , 4,3 . ESR, CRP .

50.1 (24 ~76) 2 가 9 가 Frankel 가
 , 3 7 , 12 2 , 11 4 가
 1 . 16 (Frankel
 B; 1 ,C; 13 ,D; 2) .

isoniazide, Lenke ⑥ (Table 2) 가
 rifampicin, ethambutol, pyrazinamide 가
 , 1 , (ESR), C-
 (CRP)가
 13.3
 3~5 TLSO 1.
 3~4

2. Macnab 7 , 9 , 2
 2 1 Frankel B
 D ,1
 가 1 .
 15 329.4 (200 , 540),
 , 3 2081.3cc(500cc, 5200cc) .
 15 1~2 15 ESR 56.3 mm/hr(0~15 mm/hr)
 가 5.7
 14 , 4 . ,CRP 118.7 mg/L(5 mg/L
 3) 가 2.3
 1 . Frankel B 1 , C 13
 가 ,D 2 ,E 2 B 1 ,D 8 E 10
 가

3. 가 2 (Frankel B; 1 ,C; 1)
 Frankel D E가 .
 1
 3
 Macnab⁵⁾
 가 2.
 3 (6) 6 (12)
 . Lenke 1 13
 2 5 가

Table 2. Assessment of anterior fusion grades (Lenke)

Grade	Description
1	fused with remodeling and trabeculae
2	graft intact, not fully incorporated ; no lucencies
3	graft intact with definite proximal or distal lucencies
4	graft broken or resorbed

Lenke	3 (6)	6 (12)
2	5	13
		가
		24.8 ±
8.6 (13~37 °)	12.8 ± 8.0 (7~28 °),	13.6 ± 8.3 °

(9~29 9) 12 ± 5.8 (6~22 9) .
 15.1 ± 14.6 (1~40 9) 0.8 ± 0.84 (0~2 9),
 2.8 ± 2.4 (0~6 9) 14.3 ± 14.8 (1~40 9)
 9.4 ± 8.0 (-23~-1 9), -7.4 ± 7.3 (-18~2 9)
 11.2 ± 9.9 (0~29 9) .
 (p>0.05).

10
 0.7(6~7) 2.0 ± 0 6.6 ±
 12.5 ± 10.7(2~23) 0.5 ± 0.6(0~1)
 17.5 ± 10.8(5~29)
 1.5 ± 3.3(0~8)
 5 (Fig. 1, 2).

cil⁷⁻⁸⁾
 가

Hodgson Stock¹¹⁾
 3,12), Yilmaz¹²⁾

. Medical Research Coun-

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10)

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12).



Fig. 1. A 51-year-old woman underwent posterior procedures for spinal tuberculous spondylitis of T-L junction. (A) Preoperative lateral radiograph shows destruction of L1, 2 vertebral body and kyphotic angulation. (B) Lateral radiograph taken immediately after operation. (C) Radiograph obtained at postoperative 6-year follow-up shows solid union without loosening of pedicle screws or loss of correction.

Oga¹⁷⁾
13),
14),
2
가
15,16), Moon¹⁴⁾
3
Ha Chung¹⁸⁾
가
13, 39 15
2, 가, 5, 4
가 가 가
가, 가

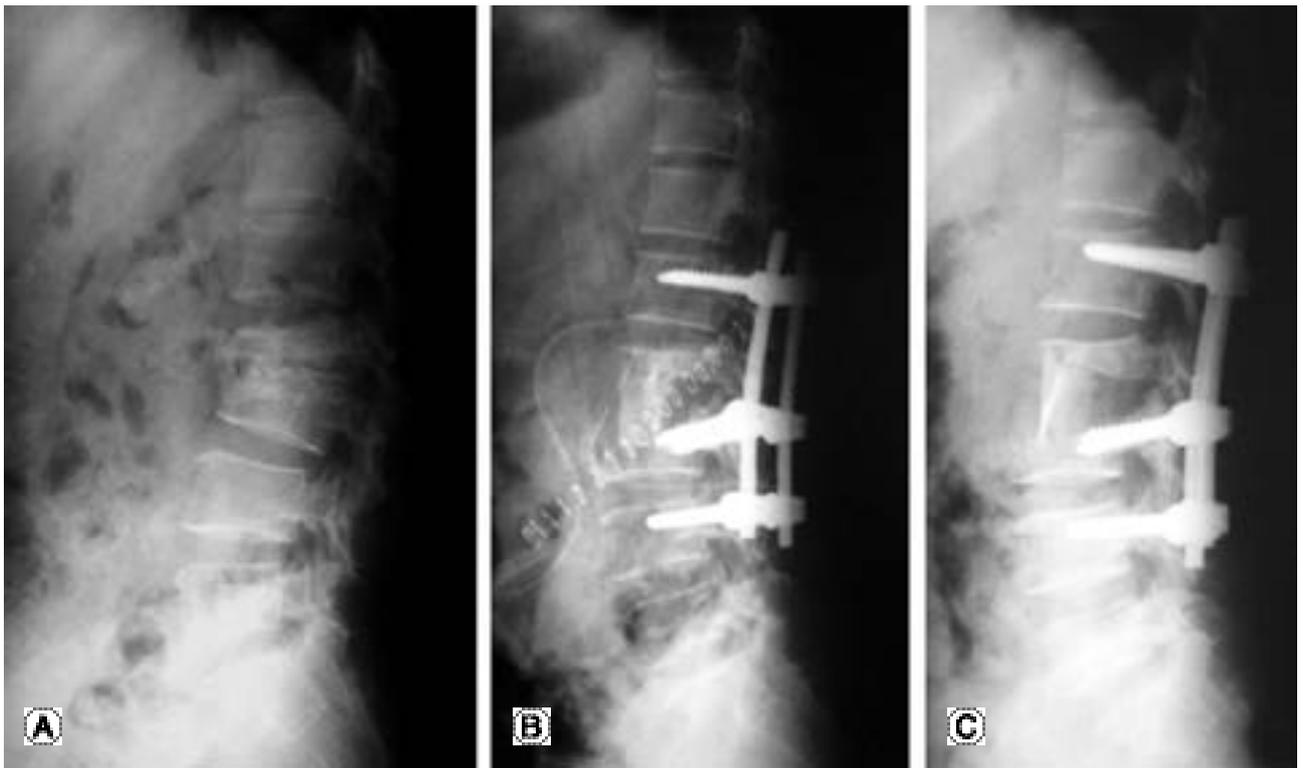


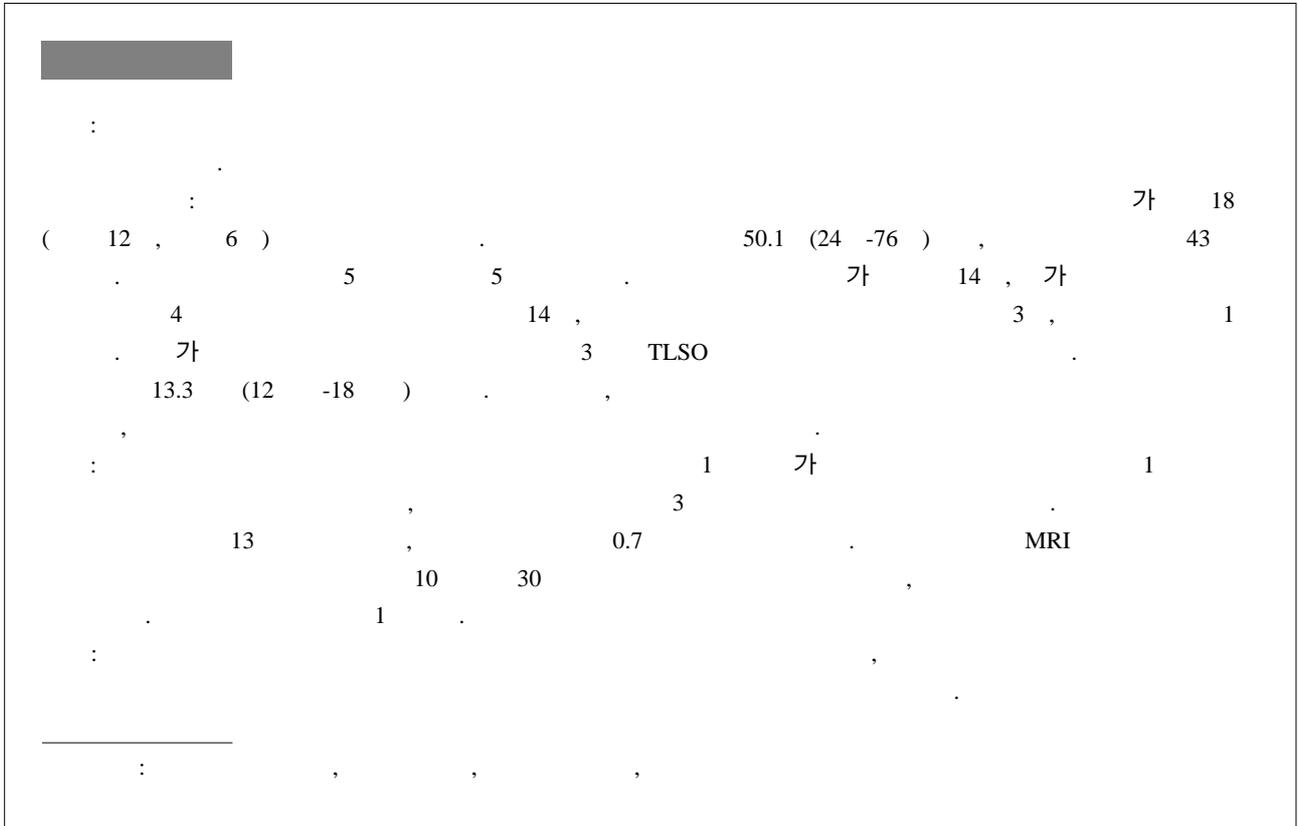
Fig. 2. A 29-year-old man underwent combined anterior iliac bone strut and posterior pedicle screw technique for tuberculous spondylitis at L2-3. (A) Preoperative lateral radiograph shows destruction of L2, 3 vertebral body and obliteration of L2-3 intervertebral disc space. (B) Radiograph immediately obtained after operation. Anterior fusion with iliac bone graft was performed and pedicle screws were inserted to the involved vertebra(L3). (C) Radiograph obtained at postoperative 2-year shows stable construct and solid union.

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6가 243

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