

## Management of Deep Infection after Posterior Spinal Instrumentation with Prolonged Suction Drainage

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### – Abstract –

**Study Design** : A retrospective analysis about related diagnostic and therapeutic factors in postoperative deep infection cases after posterior spinal instrumentation.

**Objectives** : Analysis of the inherent risk factors associated with deep infection and the efficacy of management with prolonged suction drainage without removal of implants.

**Summary of Literature Review** : Various treatment modalities have been applied to control deep infection after spinal instrumentation. Validity of removing implants to control the infection is still controversial because it may cause loss of spinal stability.

**Materials and Methods** : Five cases of postoperative deep infection after posterior spinal fixation from May 1996 to May 2000 were investigated about combined general illness, features of infection, various profiles on management of the infection with surgical irrigation and debridement followed by prolonged suction drainage, and final outcomes.

**Results** : Remarkable risk factors were diabetes and obesity. Evidences of infection such as discharge from the wound, dehiscence, fever were observed since average 18.8th day postoperatively. By only one surgical procedure for each patient followed by prolonged suction drainage for mean 19.2 days and administration of IV antibiotics for average 43.6 days followed by oral antibiotics for 33.8 days, deep infections were controlled successfully without removal of implants and without any grave complications. All achieved favorable clinical results and posterolateral fusion.

**Conclusion** : Irrigation and debridement accompanied by prolonged suction drainage using Hemo-vac and administration of susceptible antibiotics seemed to be one of the effective methods in controlling deep infection after posterior instrumentation and in maintaining the postoperative stability of spine.

**Key Words** : Deep infection, Posterior spinal instrumentation, Prolonged suction drainage

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167 4 (2.4%)

1, 5 가  
가 1, 가 4, 43 73  
61 5  
, 5  
가 ( 2.8  
2 2, 3 2, 4 1  
)  
1, 1  
(Table 1).

Hemo-vac  
18 56  
31.8 5  
Hemo-vac

1.

1996 5 2001 8  
2  
1  
가

**Table 1.** Profiles of Deep Infection after Posterior Spinal Instrumentation

Case	Sex/Age	Associated Problems	Initial Diagnosis	Fusion Level	Onset of Infection	Infection Sign Fever	ESR/CRP
1	F/58	DM Obesity Hypertension	Spinal stenosis	L3-S1	PO 8 days	Wd discharge	103 / 20.4
2	M/73	DM COPD	Spinal stenosis	L4-S1	PO 18 days	Wd discharge Wd dehiscence	25 / 5.4
3	F/43	DM Obesity Hypertension	Spinal stenosis	L4-S1	PO 16 days	Wd discharge	38 / 4.8
4	F/65	DM	Spinal stenosis	L2-S1	PO 36 days	Wd swelling & pain	72 / 8.1
5*	F/66	Malnutrition Anemia	Spinal stenosis L1 compression Fx.	T12-L2, L4-5	PO 16 days	Wd discharge Fever	49 / 21.2

\* : Referred case from local hospital  
DM : Diabetes mellitus  
COPD : Chronic obstructive pulmonary disease  
Wd : Wound  
PO : Postoperative

(Table 1).

2

(dead space)

2.

36

18.8

8

(Staphylococcus aureus)

3

(S. epi-

dermidis)

2

. 5

4

Methicillin

(MRSA, MRSE)

1

(MSSA)

Vancomycin

(dehiscence)

가 1

가 1

1

43.6(32~60)

Vancomycin

가

Teicoplanin

3.

33.8(15~60)

Fusidate

Rifampicin

가

Hemo-vac

19.2(16~21)

486(120.5-774)cc

(Fig. 1).

5

10

30 cc

가

1 cm

10 cc

5

가

4.

(ESR)

57.4(25~103) mm/hr

6

18.96(11.8~29) mm/hr

. C-

( CRP)

11.98(4.8-21.2)

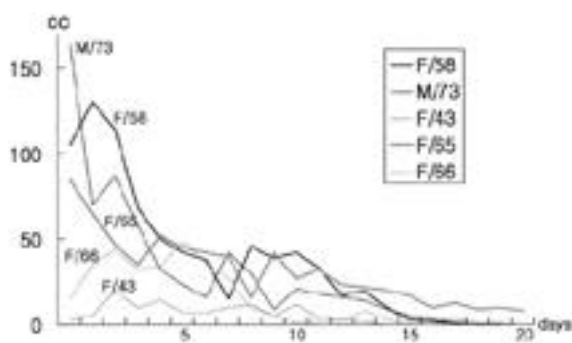


Fig. 1. Diagram showing patterns of daily drainage amount via Hemo-vac.

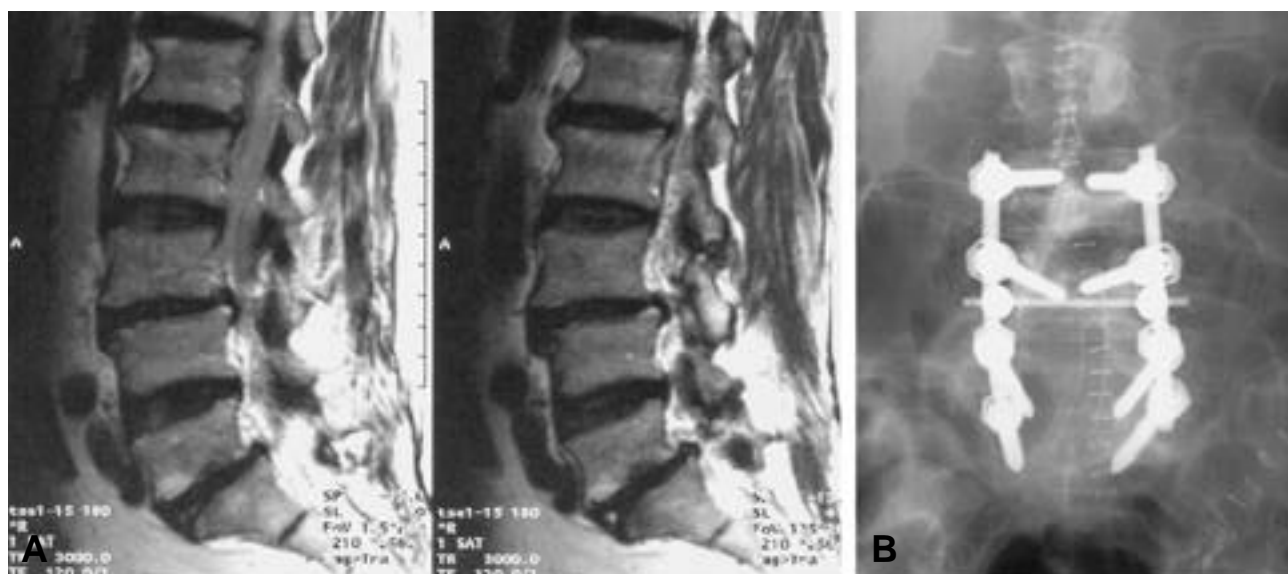
Table 2. Management of Infection and Results

Case	Organism	Susceptible Antibiotics	Duration of IV antibiotics	Duration of Oral antibiotics	Duration of Drainage	Total Amounts of Drainage	Follow-up Period	Normalization of CRP
1	MRSA	Vancomycin	49 days	38 days	PO 20 days	774 cc	PO 32 months	PO 48 days (0.3)
2	MSSA	Vancomycin Amikacin	35 days	36 days	PO 18 days	571 cc	PO 56 months	PO 14 days (0.1)
3	MRSE	Vancomycin	32 days	20 days	PO 21 days	120.5 cc	PO 25 months	PO 10 days (0.4)
4	MRSE	Vancomycin, Teicoplanin	42 days	60 days	PO 21 days	660 cc	PO 28 months	PO 64 days (0.3)
5	MRSA	Vancomycin	60 days	15 days	PO 16 days	304 cc	PO 18 months	PO 58 days (0.4)

MRSA : Methicillin resistance Staphylococcus aureus

MRSE : Methicillin resistance Staphylococcus epidermidis

MSSA : Methicillin sensitive Staphylococcus aureus



mg/dL                  가                  가                  6  
0.22(0.1~0.5) mg/dL                  . CRP가                  (Table 2).  
39.4(10~66)                  가

,  
가                  52  
102                  77.4                  .  
1  
, 5  
. , ,  
.  
58 ,  
30 m .  
, ESR/CRP 22/0.2 .  
(Fig. 2A),  
(Fig. 2B). 8 1 38.  
spiking .

11



**Fig. 4-A.** On 14th day, the wound was reopened for thorough irrigation and debridement. TLC bar was removed to minimize dead space. Two pairs of Hemo-vac were inserted for drainage.

### B. Postoperative lateral X-ray.

103/20.4	가	14	38	32
(Fig. 3).				
(dead space)	Moss-Miami	TLC	(Fig. 5),	
bar	(Fig. 4A, B).	Hemo-vac	가	
MRSA가		Vancomycin		
	. Hemo-vac	3		
100 cc	가	4		
68 cc, 7	38 cc			
15	10 cc	가	1	
cm	가		20	가
			774	
cc	2			
				0%



**Fig. 5.** Anteroposterior X-ray at postoperative 6 month shows bridging of posterolateral fusion mass.

12.9%  
 8.2%  
 3.5%  
 2.4%  
 7,11) Wright 24)  
 3.1%  
 16)  
 4.6%,  
 16)  
 9)

ing retractor  
 self-retain-

5  
 가  
 MRI X-ray , CT (scatter)  
 19) 가  
 가 ESR/CRP 18) CRP가 10  
 . Thelander 20) CRP 2 , 3  
 5~14  
 ESR 5 가 21~42 ESR  
 CRP가  
 2 5 , ESR CRP 2  
 2~5 CRP가  
 1  
 32.5(10~58) CRP가  
 Keller 7) 가 , 5)  
 8 36 18.8  
 1,6)  
 4 Methicillin Vancomycin  
 가 가

Weinstein<sup>6), 22)</sup>,  
 12)  
 (dead space), biofilm  
 Abbey<sup>1)</sup>  
 6  
 3~9  
 10  
 2  
 4~6  
 biofilm  
 가  
 가  
 3,14)  
 glyocalyx  
 biofilm  
 가  
 8). Biofilm  
 5  
 1  
 가 20  
 가  
 2,4), (biofilm) 가  
 9,11,12,15,22)  
 23), 1,8)  
 가  
 14)  
 10)

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