

MR

1

:

가

MR

: 18

42

60

MR

(stepwise discriminant analysis)

Student T - test

:

/ (

67%[28/42]

6%[1/18]),

(52%[22/42]

38%[7/18]),

/

(100%[42/42

6%[1/18]),

(86%[36/42]

39%[7/18]),

(81%[34/42]

50%[9/18]),

(20%[8/42]

11%[2/18]),

(62%[26/42]

33%[6/18])

(p

< 0.05)

MR

MR

/

,

,

/

:

/

,

,

/

가 가

MR

.

(tuberculous spondylitis)

MR

(pyogenic spondylitis)

가

가

.

.

,

MR

가

(1, 2).

가

(3 - 10). Buchelt (3)

(kyphosis),

(scoliosis),

(lateral bony bridging)

,

1995

9

2000

12

가

(loss of segmental height)

MRI

,

가

60

. 18

. MR

가

, 42

.

, 가

(thin and smooth

50.6 (6 - 82) .

abscess wall), 3

4 ,

27 ,

38 ,

7 .

(subligamentous spread),

MR

1.5 - T MR

(Siemens medical, Erlangen,

가

T1, T2

(4 - 6, 9, 10).

T1

. T1

TR/TE 694/13, T2

TR/TE

3600/101,

T1

TR/TE 890/12,

2006 8 1

2006 10 19

288 × 290 mm, 512 × 232, MR
 / 4/0.4 mm T1 가 1
 TR/TE 566/14, T2 TR/TE 4900/89, 가 MR
 T1 TR/TE 739/14 ,
 140 × 141 mm, / 4/0.4 mm,
 320 × 202 (stepwise discriminant
 MR analysis) 가 MR
 (discitis) (disc space narrowing), Student T - test
 (endplate erosion), (bone marrow edema),
 (kyphoscoliosis), (vertebral
 collapse), (subligamentous spread),
 (skip lesion), / (paraspinal mass /abscess), 3.2 ,
 (margin of paraspinal abscess), 2.8 , 5 , 58 , 50
 / (epidural mass /abscess), 14 , 11, 8, 30, 2
 (central dark signal intensity in abscess), MR
 (extension of posterior element), (endplate
 sclerosis) 가 MR / ,
 (none), , / ,
 (suspicious), (definite) , ,
 (p < 0.05). (Fig. 1) (Fig. 2)
 (none), (mild), (severe) 3가 (100%[42/42] vs
 , 6%[1/18]) ,
 , (67%[28/42] vs 6%[1/18]).
 T2
 (none), (mild), (moderate), 가 (86%[36/42] vs
 (severe) 4가 가 (Cobbs 39%[7/18]). , (52%[22/42] vs
 angle) 10, 20, 40 38%[7/18]), (20%[8/42] vs 11%[2/18])
 , / (smooth), (81%[34/42] vs 50%[9/18]), (62%[26/42]
 (intermediate), (infiltrating) 3가 가 vs 33%[6/18])

Table 1. Differential MRI Findings of Tuberculous Spondylitis and Pyogenic Spondylitis ($p < 0.05$)

MR Findings		% (No. of Cases)	
		Tuberculous	Pyogenic
Margin of paraspinal mass/abscess *	Smooth	67 (28/42)	6 (1/18)
	Irregular	31 (13/42)	44 (8/18)
	Infiltrating	2 (1/42)	50 (9/18)
Grade of endplate erosion *	None	0 (0/42)	6 (1/18)
	Mild	52 (22/42)	38 (7/18)
	Severe	48 (20/42)	56 (10/18)
Paraspinal mass/abscess *	Absence	0 (0/42)	94 (17/18)
	Presence	100 (42/42)	6 (1/18)
Central dark signal intensity on T2WI	Absence	14 (6/42)	61 (11/18)
	Presence	86 (36/42)	39 (7/18)
Subligamentous spread	Absence	19 (8/42)	50 (9/18)
	Presence	81 (34/42)	50 (9/18)
Grade of vertebral collapse	None	40 (17/42)	78 (14/18)
	Mild	40 (17/42)	11 (2/18)
	Severe	20 (8/42)	11 (2/18)
Posterior element extension	Absence	38 (16/42)	67 (12/18)
	Presence	62 (26/42)	33 (6/18)

* The discriminant MR findings in step-wise discriminant analysis.

3 가 ($p < 0.05$) (Table 1).
 가 가 MR lesion), , , (skip

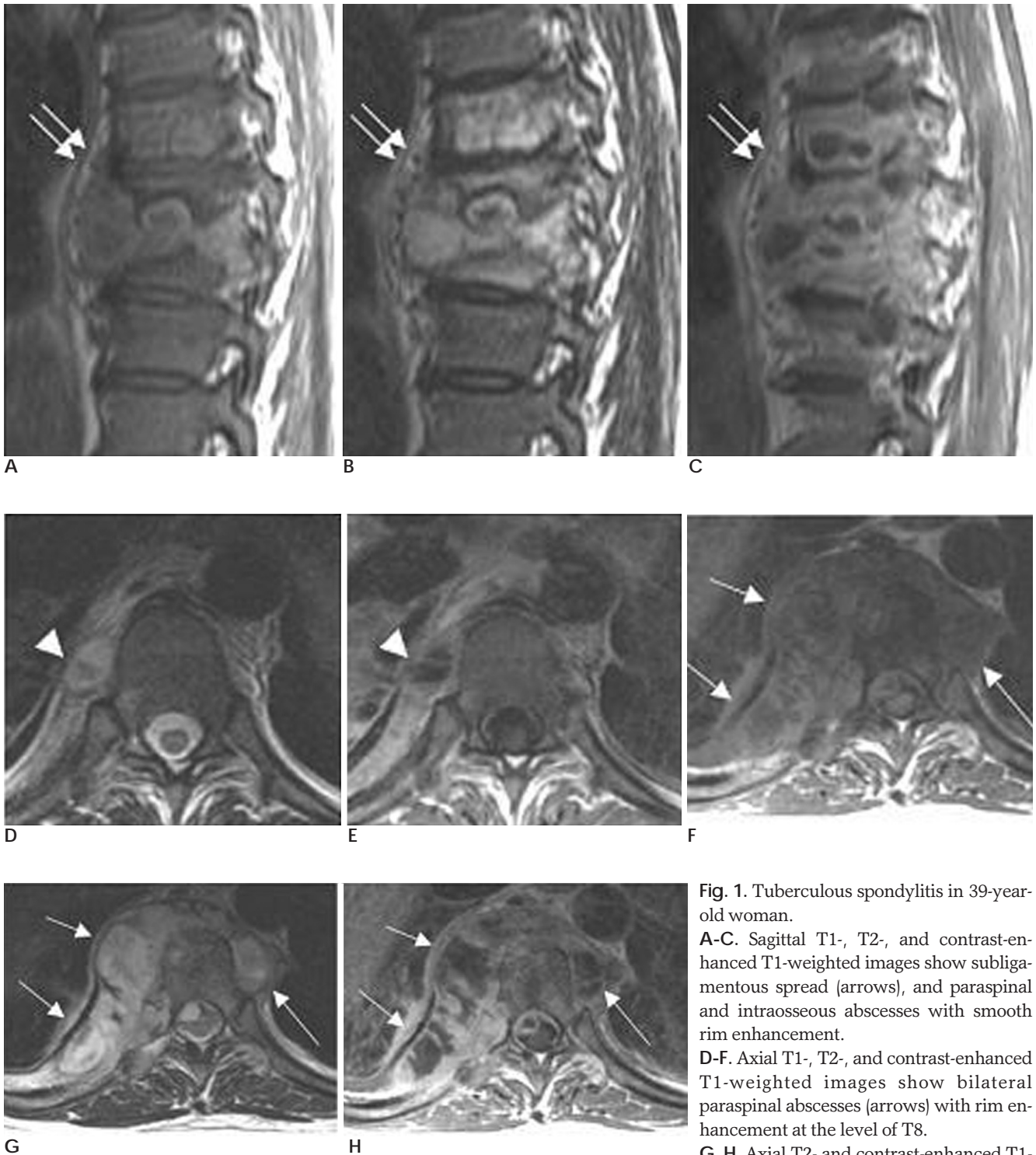


Fig. 1. Tuberculous spondylitis in 39-year-old woman.

A-C. Sagittal T1-, T2-, and contrast-enhanced T1-weighted images show subligamentous spread (arrows), and paraspinal and intraosseous abscesses with smooth rim enhancement.

D-F. Axial T1-, T2-, and contrast-enhanced T1-weighted images show bilateral paraspinal abscesses (arrows) with rim enhancement at the level of T8.

G, H. Axial T2- and contrast-enhanced T1-weighted images show right paraspinal abscess with central dark signal focus and rim enhancement at the level of T7 (arrows).

:

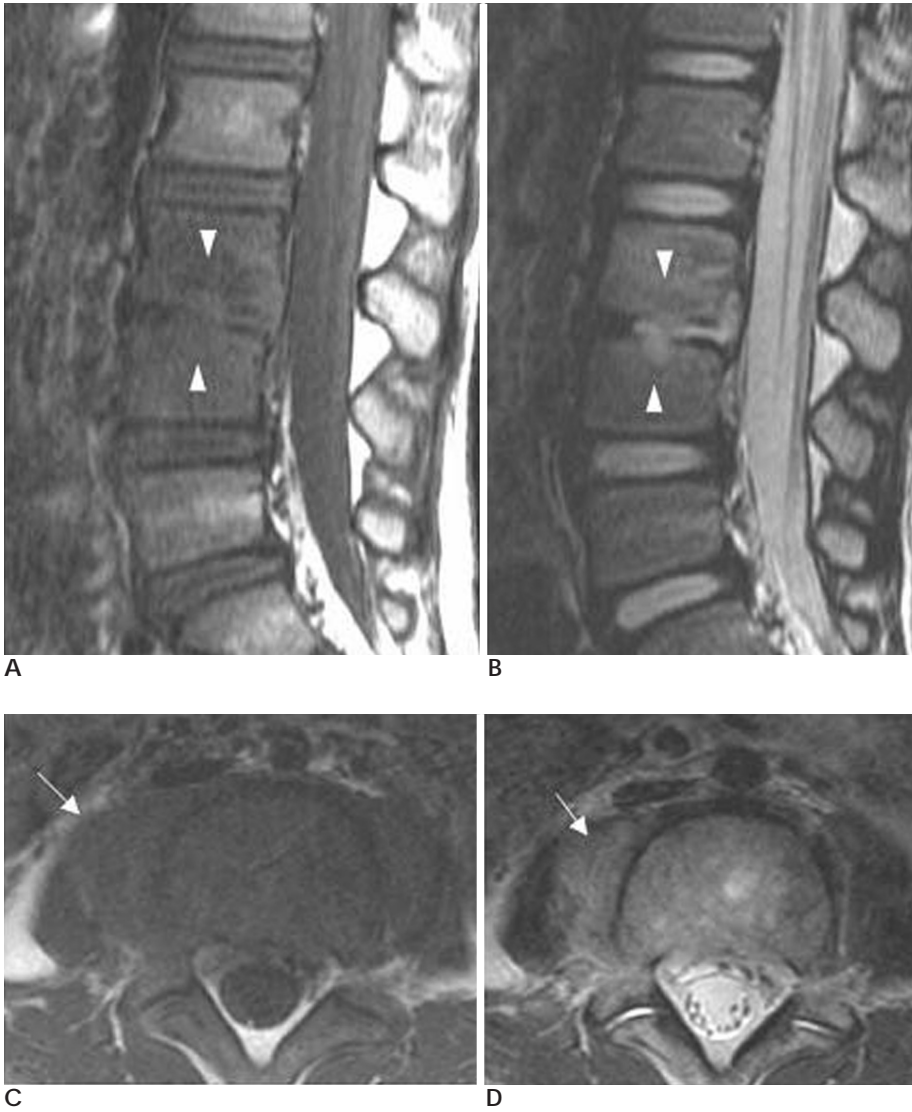


Fig. 2. Pyogenic spondylitis in 7-year-old girl.

A, B. Sagittal T1- and T2- weighted images show severe endplate erosion (arrowhead) and disc space narrowing in L3 and L4 spines.

C, D. Axial T1- and T2-weighted images show ill-defined paraspinal infiltration of inflammation in right psoas muscle (arrow) at the level of L4.

(2, 12).
 가 가
 (13 - 15)
 89%,
 MR 가
 65%
 3가 MR
 90.5%,
 83.3%
 (4, 7, 11).
 (4, 16 -
 (spinal canal)
 가 가
 (1, 16).
 가 가

,
(2).
가 (Fig. 1) (Fig. 2)
(20). 가 가 T2
MR T1 가
, T2
, 2
(10).
MR /
, (skip
, 가 lesion),
(4, 9, 11, 21, 22).
가
(5, 23). MR
가 가 가 (5, 6, 8 - 10, 29),
(14, 23). Post MR
(22, 24) 가 MR
(25) 가 가
75%, 63%
13%
Jung (9) MR 가
(thin and smooth abscess wall), 3
가
가 T2 MRI / 가
가 가 (5, 26). / MR
MR
(2, 5, 27, 28). MR 가
가
(23, 28). MR

가
MR
가
MR

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Tuberculous Spondylitis vs Pyogenic Spondylitis: Focusing on the Discriminative MR Findings for Differentiation¹

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Purpose: The purpose of this study is to analyze the most discriminative MR findings for making the differential diagnosis of tuberculous and pyogenic spondylitis.

Materials and Methods: Sixty MR scans of 18 pyogenic spondylitis patients and 42 tuberculous spondylitis patients were retrospectively reviewed. The statistical analysis was performed using stepwise discriminant analysis and Student's T-test.

Results: The patients with tuberculous spondylitis had a significantly higher incidence of MRI findings as follows ($p < 0.05$): smooth margin of a paraspinal mass/abscess in 67% [28/42] of the tuberculous spondylitis patients vs 6% [1/18] in the pyogenic spondylitis patients, mild endplate erosion in 52% [22/42] vs 38% [7/18], respectively, the presence of paraspinal mass/abscess in 100% [42/42] vs 6% [1/18], respectively, central dark signal intensity of the abscess in 86% [36/42] vs 39% [7/18], respectively, subligamentous spread in 81% [34/42] vs 50% [9/18], respectively, severe vertebral collapse in 20% [8/42] vs 11% [2/18], respectively, and posterior extension in 62% [26/42] vs 33% [6/18], respectively. Among of them, the significant discriminative MR findings were the margin of a paraspinal mass, the grade of endplate erosion and the presence or absence of a paraspinal mass in that order.

Conclusion: In the differentiation of tuberculous and pyogenic spondylitis, the margin of the paraspinal mass, the grade of endplate erosion and the presence or absence of a paraspinal mass are the most three discriminating MR findings in that order.

Index words : Spine, infection

Magnetic resonance (MR), comparative studies

Spondylitis

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