

:
 :
 가 7 13 21
 3 , 4 , 5 , 1 . 3
 3 -6
 : 13 가 9 (69.2%), 가 가 2 (15.4%)
 , 2 (15.4%) 가 9 7 T2
 가 4 . 2
 T2 가 가 1

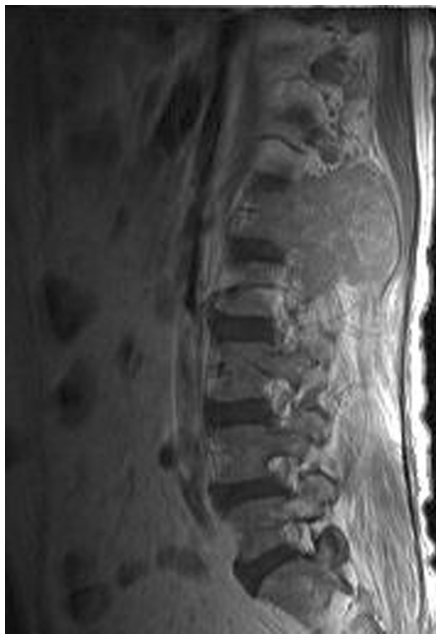
:
 가 , , , ,
 30% 가
 90%
 (1, 2).
 , , ,
 (instability) 가 가
 (3). 가 가 radiosurgery unit (BrainLab, Heimstetten, Germany)
 가 가 Novalis
 (4). 가 가
 , , , , , Novalis
 (MRI)

1
 2

:

CT MRI 가
(segmental image fusion
CT
method)
MRI
2003 11 2005 6
21
(MRI) 가 7
13
2 , 2 , 1 , 1 1
가
64 , 가 6 , (1-5 , 2.9)
가 1 25.76Gy ()
가 3 , 가
가 4 . 2 (MRI)
가 가
MRI
3D (Rapidia, Infinitt, Seoul, Korea) 가
(Exactrac , stereotactic body frame, BrainLab)
1.5T MRI (Symphony,
Siemens Medical Systems, Erlangen, Germany) 4
MDCT (Multidetector - row CT) (Volume Zoom, Siemens
Medical Systems, Erlangen, Germany) . MR
TR/TE 450/12 T1
TR/TE 3600/108 T2 , 가가
T1
3 mm, 4 mm FOV 280
mm ,
150×256 , T1
96×256 , T2 270×512
0.1 mmol/kg Gadolinium - DTPA (Magnevist,
Schering, Berlin, Germany)가 . CT
120 kVp, 110 mAs, 50 cm, collimation 2.5
mm, 3 mm, (increment) 2 mm
orthogonal
angle
MRI CT
(PatXfer 4.21) , BrainLab platform software
dicom Brainscan soft-
ware (Version 5.1)
CT
CT
CT () MR
CT MRI MR
(median follow - up period)
4 , 7 2 1
가 , 3 3 , 1 6 , 1
15 가
13 가 9 (69.2%),
가 가 2 (15.4%) , 2 (15.4%)
가 가 11 (84.6%)

9 52.3% 10-91%
 3 가 6 (compression) 가 4
 가 가 4
 T2
 9 6 (Fig. 1), 2
 가 (Fig. 2).
 T2 가 1
 가 (5).
 T2 가 가 (seminoma),



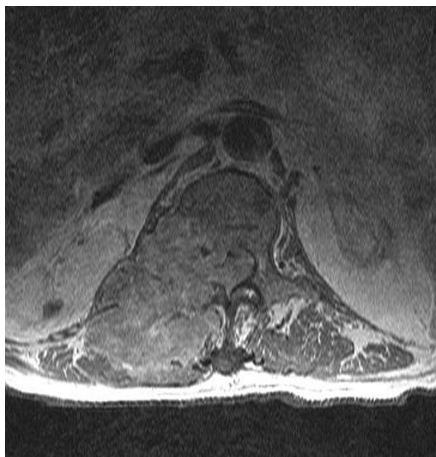
A



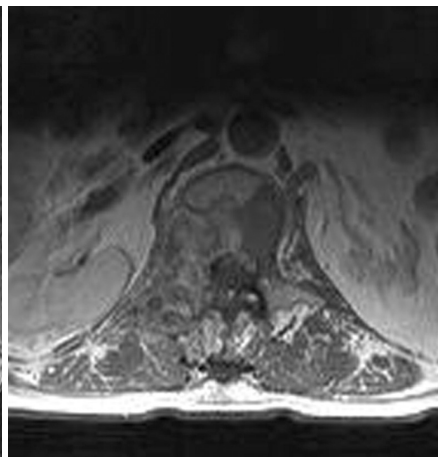
C



E



B



D

Fig. 1. Metastatic spinal tumor in 65-year-old man with hepatocellular carcinoma. **A, B.** Sagittal T1-weighted (**A**) and contrast enhanced axial T1-weighted (**B**) images reveal bulky mass involving L1 vertebral body and right pedicle. **C, D.** On 6 month follow-up images after treatment, the volume of the tumor is significantly decreased. **E.** Compressive deformity of L1 vertebra is seen on 15 month follow-up sagittal T2-weighted image.

9 4

2 T2
가 가 .

4

가 가

가 가 2 4 ,

가

가

가

가

가
가

가

MR

1. Cobb CA, Leavens ME, Eckles N. Indications for nonoperative treatment of spinal cord compression due to breast cancer. *J Neurosurg* 1977;47:653-658
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2002;4:231-237

Metastatic Spinal Tumors: MR Findings after Novalis Radiosurgery¹

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Purpose: To assess the therapeutic effect of Novalis radiosurgery for metastatic spinal tumors and evaluate the changes after treatment using MR imaging.

Materials and Methods: Between November 2003 and June 2005, 21 patients with metastatic spinal tumors underwent Novalis radiosurgery. Of these patients, the 7 with 13 metastatic spinal tumors who had undergone follow-up MR imaging were included in this study. The tumor locations were cervical spine in three, thoracic spine in four, lumbar spine in five and sacrum in one. During the first three months after Novalis radiosurgery, follow-up MRI was performed monthly and subsequently at 3 - 6-month intervals. On MR imaging, the volume of the tumors, the changes of their signal intensities and any changes in adjacent spinal cord were evaluated.

Results: Among the 13 lesions, 9 were decreased in volume (69.2%), 2 were stable (15.4%) and 2 were slightly increased. Seven of 9 lesions showed decreased signal intensity on T2 weighted images and 4 had compressive deformity. Two of 9 lesions had increased T2 signal intensity and tumor necrosis were detected on contrast-enhanced MR imaging. No changes in spinal cord were noted in any of the lesions. Those changes were detected on MRI obtained 1 month after Novalis surgery and the lesion sizes were gradually changed up to 3 months.

Conclusion: Novalis radiosurgery was effective for the treatment of metastatic spinal tumor and the suppression of tumor growth. The estimation of therapeutic effect and detecting complication were precisely evaluated on MR imaging.

Index words : Spine, secondary neoplasms
Spine, MR
Therapeutic radiology

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