

MR  
: 1993 1 1998 7 166  
67 ( 44 , 23 , 20 )  
가  
52 , 7 , 5 , 2 , 1 . T1  
T2 ,  
가  
: 6 (n=6),  
(n=19), (n=12), (n=7)가  
83.3 %, 100 %, 83.3 %, 33.3 % 98.4 %, 78.7 %, 95.6 %, 83.6  
% 97 %, 94.2 %  
:  
20 1  
(1-3). 46 1.0T (SMT-100x, Shimadzu, Kyoto), 21  
1.5T (Signa Horizon, GE Medical System, Milwaukee, WI)  
(extraarticular resection)  
T1 (450-650/12-20/3-4, repetition time/echo time/excitations) T2 (1500-3000/60-80/3-4) Gadolinium-DT-PA 0.1mmol/kg  
(4-8). 가  
MR 가  
4-10mm, 2-10mm, 256 ×  
256, FOV 15-20cm  
1993 1 1998 7 166 가  
MR 가 T1  
( 44 , 23 , 20 ) 67 가  
가 (suprapatellar recess) 4mm, 12.5mm  
52 , 7 , 5 , 2 , (9), 5mm (10),  
(11), 가  
(non-dependent portion)

(12).

Table 1. Statistical Analysis for the MR Criteria of Joint Involvement

	TP	TN	FP	FN	SN	SP	Total
Intrasynovial mass	5	60	1	1	83.3%	98.4%	67
Disruption of cortical bone	6	48	13	0	100 %	78.7%	67
Joint effusion	2	51	10	4	83.3%	95.6%	67
Lesion along the cruciate ligament	5	44	2	1	33.3%	83.6%	52

TP = true positive, TN = true negative, FP = false positive, FN = false negative, SN = sensitivity, SP = specificity

Table 1

MR  
1 ) 5  
(transarticular)  
(Fig.1)  
(Fig.2). 1  
( 16 , 2 , 1 ) 6  
13  
(Fig. 3). 12  
( 7 , 3 , 2 ) 2

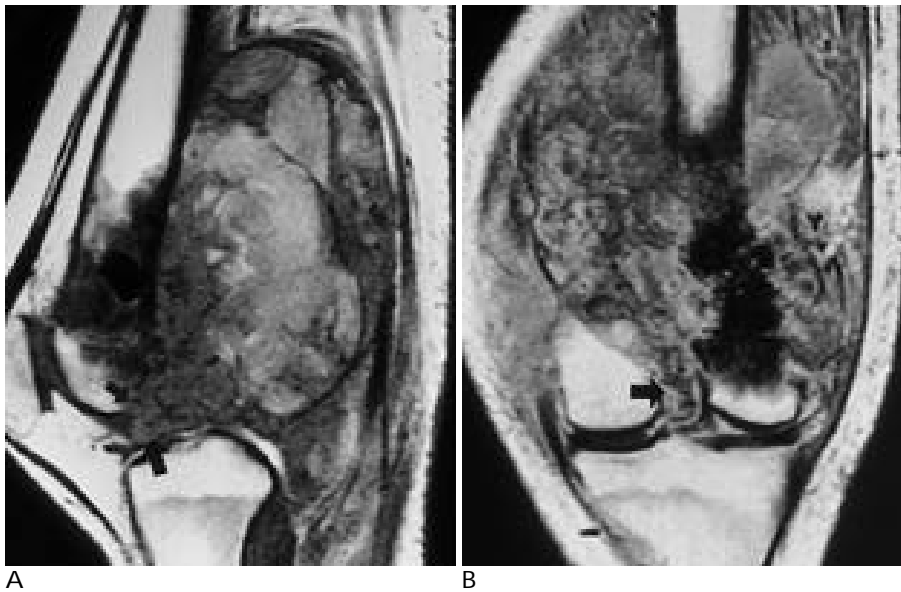


Fig. 1. A 19-year-old man with osteosarcoma in the distal femur. A. T1-weighted sagittal image shows large soft tissue mass arising from distal femur. Cortical destruction (small arrow) and intrasynovial component of the mass (arrow) are noted. B. Enhanced coronal image shows mass in the intercondylar fossa (arrow)

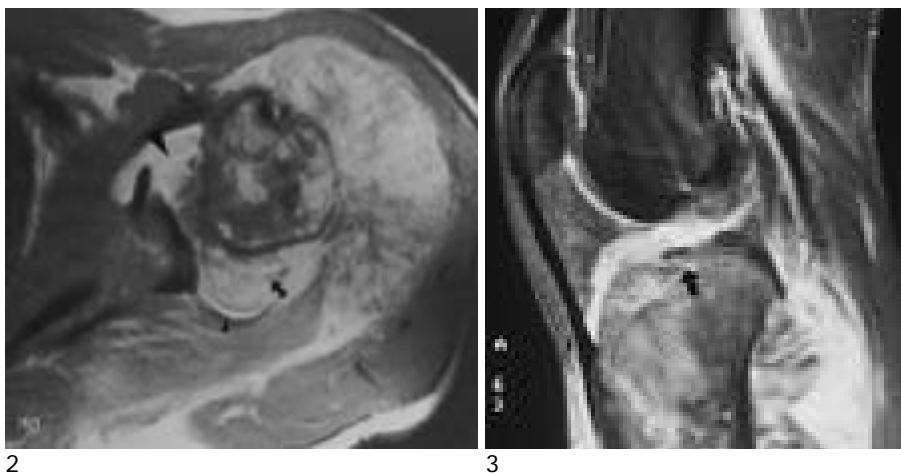


Fig. 2. A 20-year-old man with osteosarcoma in the proximal humerus. Axial T2-weighted image shows mass in the synovial cavity (arrows). The mass revealed extrasynovial mass which displaces synovial cavity pathologically. Arrowhead indicates joint effusion. Fig. 3. A 16-year-old boy with osteosarcoma in the proximal tibia. Enhanced sagittal image shows disruption of cortical bone at articular portion (arrow). Pathologic examination confirmed cortical erosion, but no involvement of joint was found.

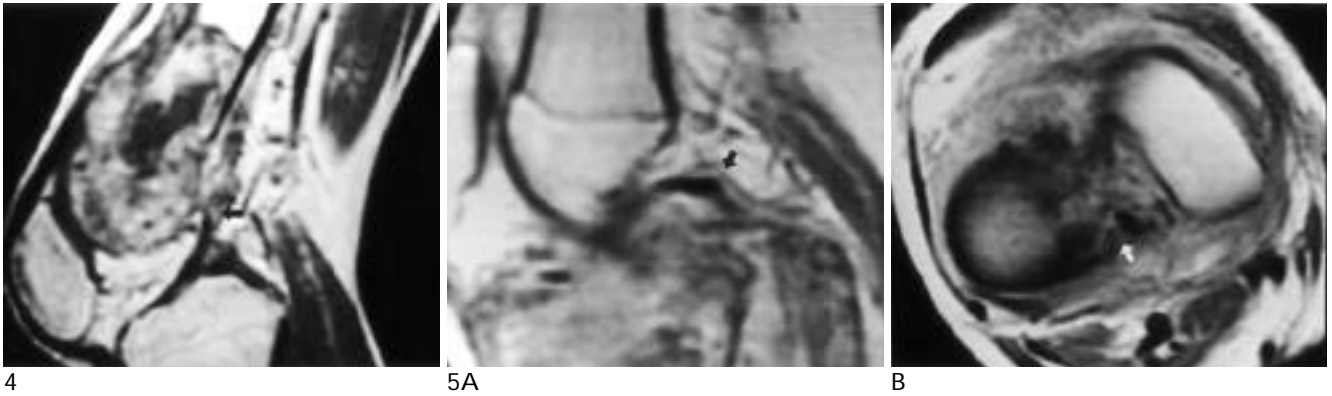


Fig. 4. A 18-year-old man with osteosarcoma in the distal femur.

Enhanced sagittal image shows heterogeneously enhancing mass along the anterior cruciate ligament (arrow). Pathologic examination confirmed joint involvement.

Fig. 5. A 25-year-old man with osteosarcoma in the proximal tibia.

A and B. Enhanced sagittal (A) and axial (B) images show enhancing lesion along the posterior cruciate ligament (arrow in A and B). Pathologic examination confirmed inflammatory synovium not tumor.

4 (Fig.4) 7 5 2 17). 19 6 (16, 6) (Fig. 5). 1 17). 97 %, 942 % 가 (16- 가 1970 17) 가 (1-3). Enneking (13, 14). (in- tracompartment) (extracompartment) 가 19-24% 3.6% (6/166) (15-17) 가 (microinvasion) Simon (15). 가 (15). 가 (4-8). 가 (mul- tiplanar) MR 가 가

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## MR Imaging of Osteosarcoma: Emphasis on Joint Involvement<sup>1</sup>

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**Purpose :** To evaluate MR imaging findings of joint involvement in patients with osteosarcoma

**Materials and Methods :** Among 166 patients with osteosarcoma treated between January 1993 and July 1998, 67(44 men and 23 women, mean age 20 years) whose tumors had invaded the epiphysis were included in this study. Those with preserved normal bone marrow signal intensity between the tumor and cortical bone were excluded. Tumors were located around the knee (n= 52), the hip (n= 7), the shoulder (n= 5), the ankle (n= 2), or the wrist (n= 1). For all patients, pre-operative spin echo pre- and post-contrast enhanced MR images were obtained. In all cases, we assessed the presence or absence of intrasynovial mass, intraarticular disruption of cortical bone and articular cartilage, and joint effusion, and also evaluated the mass around the cruciate ligaments of the knee. All patients underwent surgery and MR findings were correlated with the results of pathologic examinations.

**Results :** In six patients the tumor was found to involve the knee joint. Sensitivity and specificity for the intrasynovial mass (n= 6), intraarticular disruption of cortical bone and articular cartilage (n= 19), mass around the cruciate ligaments (n= 7), and joint effusion (n= 12) were 83.3%, 100%, 83.3%, 33.3% and 98.4%, 78.7%, 95.6%, 83.6%, respectively, while accuracy for the intrasynovial mass and mass around the cruciate ligaments was 97% and 94.2% respectively.

**Conclusion:** If MR imaging indicates the presence of a mass in the synovial cavity or around the cruciate ligaments, this is suggestive MR findings of joint involvement.

**Index words:** Osteosarcoma

Bone neoplasms, MR

Joints, MR

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