

1

가 가
 :
 : 11 (: 10 -4 , : 45)
 12 5 , 2 , 2 , ,
 1 , , , , ,
 , (12)
 (5) , 가

12 , 가 8 ,
 9 , 5 ,
 5 가 3 , 8 (67%)
 MR 가 4 (33%)
 T1 , T2
 . MRI 5
 MRI 3 2

가

가 가 가
 , 가 가 가 (5-
 (1-4). 14).
 , Tc99m - MDP 가
 (Computed tomography, CT
), (Magnetic resonance imaging, MRI
),

11 가 6 , 가 5
 , 10 4 45
 , 가 7 가 1 4

3 , 1 4
 , 7
 , 2 . 3
 11 2 , 2 , 12 5 ,
 1 2 , 2 , , 1
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 ART(Mountain View, CA. U.S.A.) 9 7 MHz
 , 2 7.5 MHz
 (coupling agent)

3 mm
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 MRI 5
 MRI 1 1 1 MRI
 2 , 1 , 1 ()
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 MRI

가 12 (Fig. 1-3),

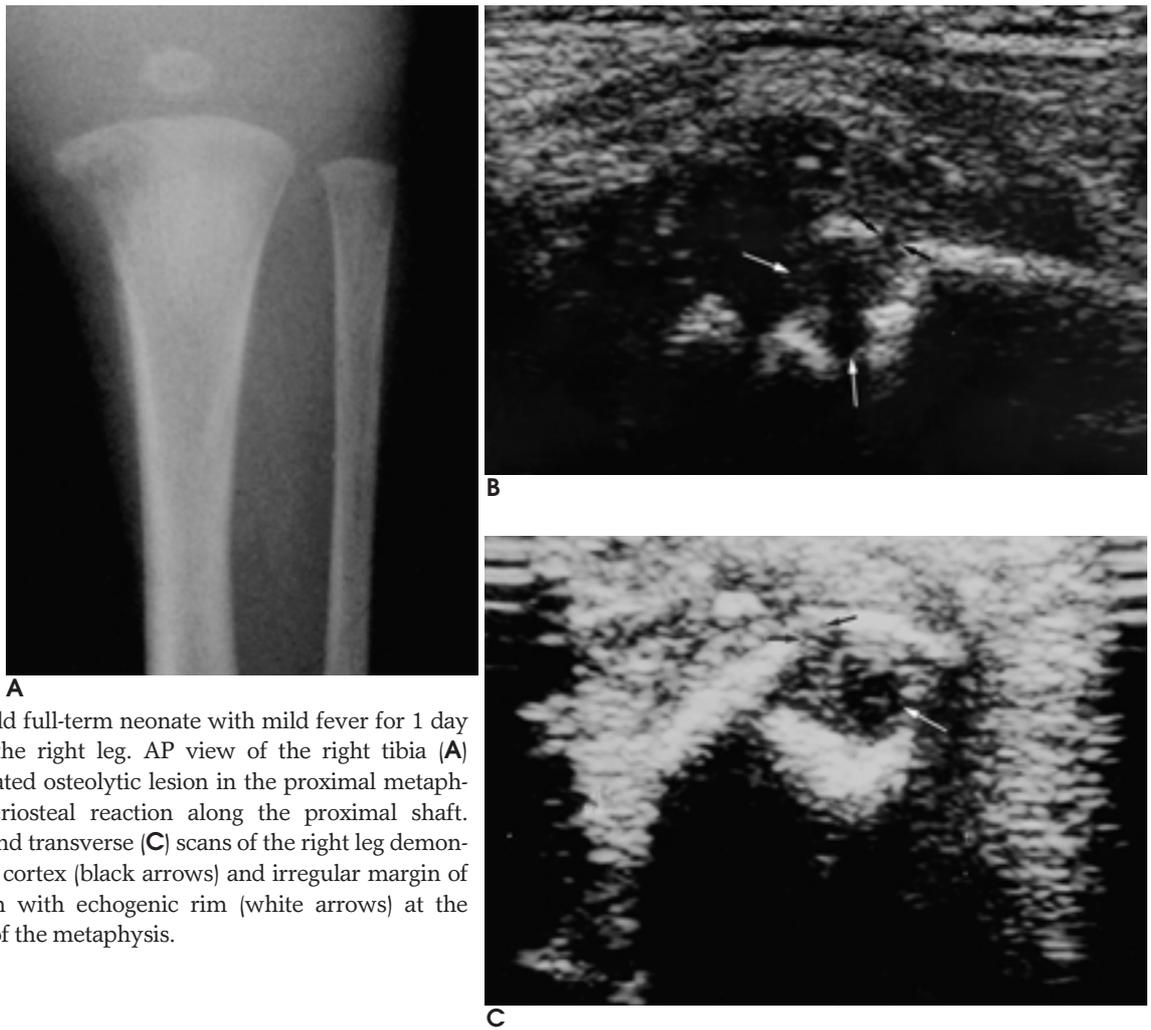
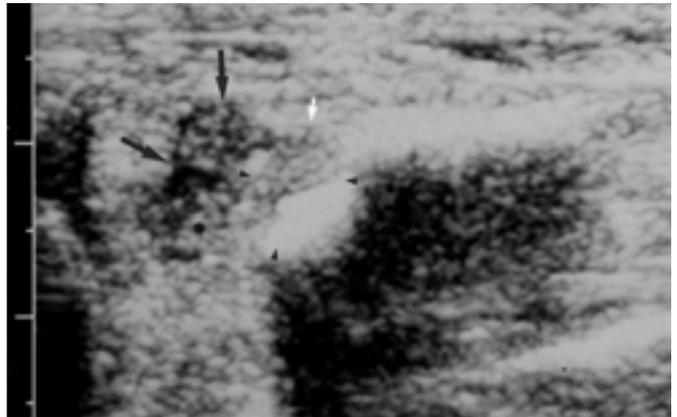


Fig. 1. A 25-day-old full-term neonate with mild fever for 1 day and swelling of the right leg. AP view of the right tibia (A) shows ill demarcated osteolytic lesion in the proximal metaphysis and fine periosteal reaction along the proximal shaft. Longitudinal (B) and transverse (C) scans of the right leg demonstrate interrupted cortex (black arrows) and irregular margin of hypoechoic lesion with echogenic rim (white arrows) at the medullary space of the metaphysis.

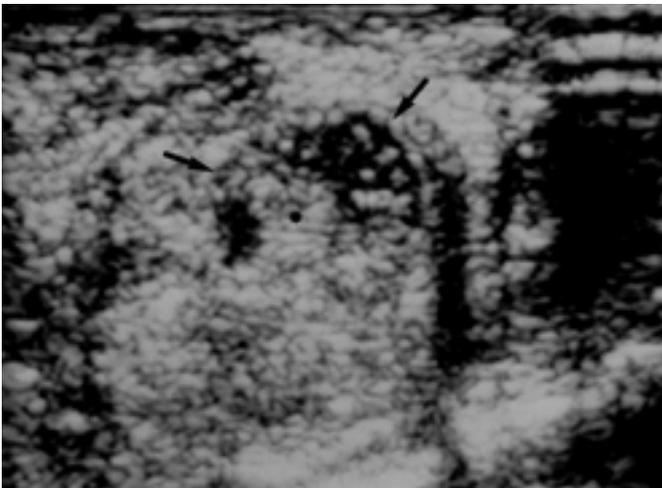
12 (Fig. 1 - 3),
 3 mm
 8 , 9
 5
 가 가 (Fig. 2, 3).
 8 (67%) 가 2 가 8
 3 , 가 2 가 가
 (Fig. 1, 2), 4 (3 1)
 5 2 가 (3, 15). Mok (16)
 (Fig. 3). 가 가
 MRI , T2 가 가
 MRI 5 가 가
 MRI 가 가
 3 (Fig. 3) 2 가
 MRI 2 가



A



B



C

Fig. 2. A 40-day-old premature infant with soft tissue swelling of the left buttock. AP view of the pelvis (A) demonstrates osteolytic lesion with irregular margin in the proximal metaphysis of the left femur and diffuse soft tissue swelling of left hip. Longitudinal (B) and transverse (C) scans of the left femur reveal hypoechoic and echogenic lesions at the proximal metaphysis (black arrowheads) with destroyed cortex (white arrow). The capital femoral epiphysis is irregular in shape (black arrows) and contains multiple echogenic lesions (asterisks).

41 - 100%

(6, 8).

가 . CT

가 . MRI

가 Gaucher's disease (17 - 20). (5 - 8, 10, 12). 가 8 (67%)

가

(18). (14)

가 85.7%

(5 - 13).

28.5%

3 mm

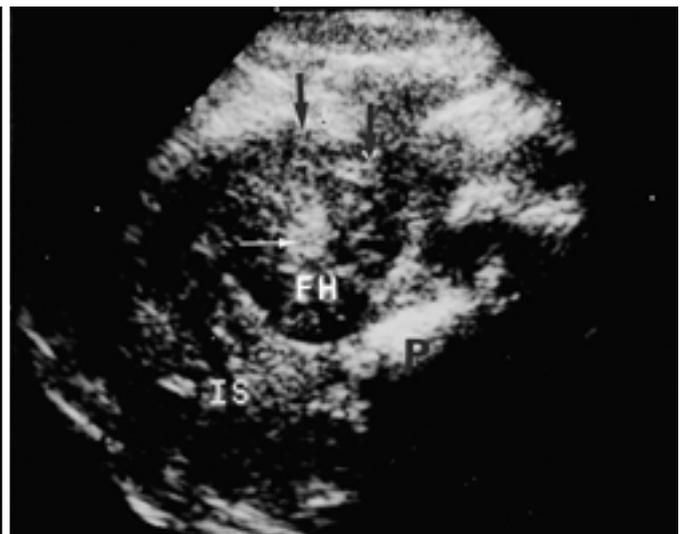
1 - 2

7

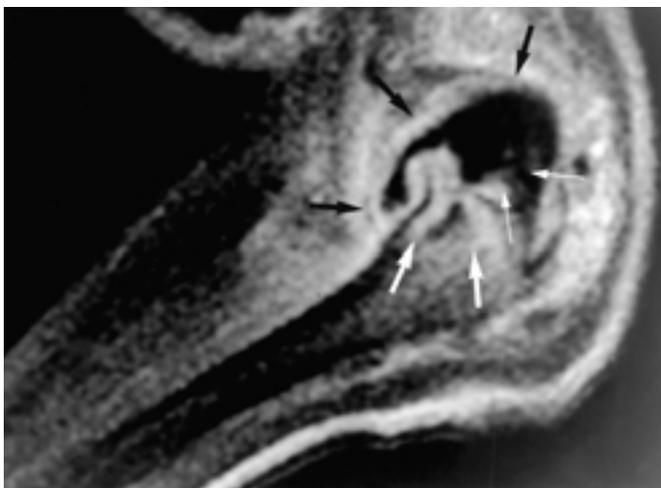
가



A



B



C

Fig. 3. A 20-day-old premature infant with swollen right hip. Plain radiograph demonstrated no definite bony lesion or periosteal reaction (not shown). Longitudinal (A) scan of the femur shows the interrupted ventral cortex (white short arrows) and hypoechoic and echogenic areas (white thick arrows) in the proximal metaphysis of the femur (FEM). Transverse scan (B) of the hip joint demonstrates focal echogenic lesion (white thin arrow) in the central portion of the capital femoral epiphysis (FH). The hip joint is distended with echogenic fluid (black arrows). The capital femoral epiphysis (FH) is subluxated in relation to the ischium (IS) and pubic bone (P). The Gd-enhanced T1-weighted sagittal image (C) demonstrates enhancing lesions in the proximal metaphysis (white thick arrows) and epiphysis (white thin arrows) of the femur and distended joint capsule with irregular thick synovial enhancement (black arrows).

(6). 가 가 가 가
 가 가 가 가
 (6, 7). Riebel (10) 가
 가 (6, 7).
 가
 (10) 12 Riebel 12
 67%
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 가 30 - 50% (3, 20).
 5
 가
 3 가
 가가
 가
 가 5 가
 5 가 5
 MRI 3 2
 1 MRI
 가가
 가
 가

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Sonographic Evaluation of Acute Osteomyelitis in Infants¹

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Purpose: To analyze the related sonographic findings and to determine the value of sonography in establishing the diagnosis of acute osteomyelitis in infants.

Materials and Methods: The sonographic findings of eleven infants aged 10 days - 4 months (mean, 45 days) with acute osteomyelitis were retrospectively evaluated. The involved bones were the femur (n = 5), humerus (n = 2), tibia (n = 2), rib (n = 1), sternum (n = 1), and calcaneus (n = 1). Discontinuity or destruction of cortical margins, echotexture of the metaphysis and epiphysis, the presence of subperiosteal hypoechoic lesion, adjacent soft tissue swelling, distension of the joint capsule, the echotexture of joint effusion, and dislocation or subluxation of the involved joint were evaluated. The sonographic findings were compared with the plain radiographic (n = 12) and MR (n = 5) findings, with special attention to the identification of the metaphyseal or epiphyseal bony lesions and the involvement of adjacent joints.

Results: The sonographic findings of osteomyelitis were cortical discontinuity or destruction (n = 12), hypoechoic lesions with an echogenic rim in the metaphysis (n = 12), subperiosteal hypoechoic lesions (n = 8), soft tissue swelling (n = 9), a distended hip joint, with echogenic fluid (n = 5), ill-demarcated echogenic lesions in the capital femoral epiphysis (n = 5), and a subluxated hip joint (n = 3). Plain radiographs revealed well or ill-defined osteolytic lesions in the metaphysis, accompanied by cortical destruction (n = 8), new periosteal bone formation (n = 3) and reactive sclerosis (n = 2). Abnormality of the femoral epiphyses and joint involvement were not detected on plain radiographs, and in four cases no abnormality was noted. MR imaging showed that at T1WI, affected bony lesions were of low signal intensity and enhanced, with high signal intensity at T2WI. In all cases, both metaphyseal and epiphyseal lesions were demonstrated at MRI, but in one of the three cases in which an epiphyseal lesion was seen at MRI, this was not detected at US.

Conclusion: Sonography is not only more sensitive than radiography in evaluating metaphyseal bony lesions but also useful in assessing concomitant joint and epiphyseal involvement of acute osteomyelitis in infants. Sonography is, therefore, a useful additional diagnostic tool for the early detection and management of acute osteomyelitis in infants.

Index words : Bones, US
Bones, infection
Infants, newborn, skeletal system

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