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Ultrasonography in hip joint effusion

Report of a child with transient synovitis

In a 7-year-old boy with clinical symptoms of transient synovitis of the hip, an intracapsular effusion was diagnosed with computed tomography and ultrasonography. An intracapsular pressure of 50 mmHg was recorded prior to aspiration of 5.5 ml of clear fluid. Repeated ultrasonography immediately after aspiration verified a reduction in effusion, and serial examinations on the following days did not reveal any recurrence of the effusion

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Conventional radiography of the hips offers little information about intracapsular effusion in transient synovitis (Brown 1975). Available diagnostic measures so far have been computed tomography (CT) or diagnostic aspiration which has, in this age group, to be undertaken in general anaesthesia. None of these methods are suitable for serial examinations.

It has been suggested experimentally (Woodhouse 1964) and clinically (Kloiber et al. 1983) that an intracapsular effusion associated with increased pressure compromises circulation in the proximal femoral epiphysis; aspiration of the joint would thus be of therapeutic value in addition to having a palliative effect.

In the case of transient synovitis reported here ultrasonography was successfully used in the diagnosis of a hip joint effusion. Repeated ultrasonography after aspiration showed a marked decrease in intracapsular effusion.

Case report

A 7-year-old boy with no previous history of hip pain presented with a 3-week history of intermittent minor left hip pain and a limp. He was brought to the hospital because the pain had become worse. There was no history or clinical evidence of upper respiratory infection. He had marked painful restriction of movements in the left hip. The temperature was 37.0°C, ESR 18 mm/h. Conventional radiographs of the pelvis and hips in AP and frog-leg projections were normal. Ultrasonography was performed with a 10.0 MHz sector transducer (Diasonics DRF 12) in a sagittal plane from the ventral aspect of the hip (Figure 1). Distension of the joint capsule was measured and related to the corresponding CT findings (Toshiba TCT 80 A) obtained on the same occasion in a transverse plane across both hips with the patient supine with hips and knees in a few degrees of flexion. The patient was examined just before and immediately after aspiration and with ultrasonography on the following days. The intracapsular pressure was recorded prior to aspiration. ^{99m}Tc MDP scintimetry performed just before aspiration showed a 30% increase in activity in the proximal femoral epiphysis as compared to the contralateral hip. Ultrasonography and CT examinations revealed an intra-articular effusion distending the capsule anteriorly with a maximum (10 mm) distension along the neck of the femur (Figure 2). The hip was aspirated for 5.5 ml of clear fluid. The intracapsular pressure was 50 mmHg. Immediately after aspiration, ultrasonography and CT examinations showed that the capsular distension was now reduced to 2 mm (Figure 3). After aspiration the clinical symptoms subsided rapidly. Daily ultrasonography for 3 days revealed further decreases in effusion; within a week it was normal. Clinically, there was no pain or limp, and the range of motion was restored. Conventional cultures on joint fluid were negative.

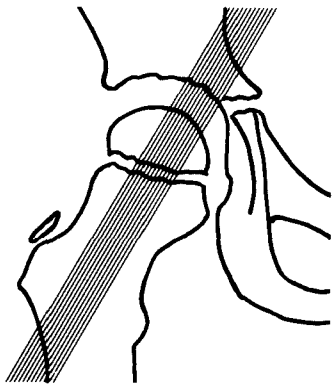

Figure 1. The direction of the ultrasonography sectioning from the ventral aspect along the neck of the femur.

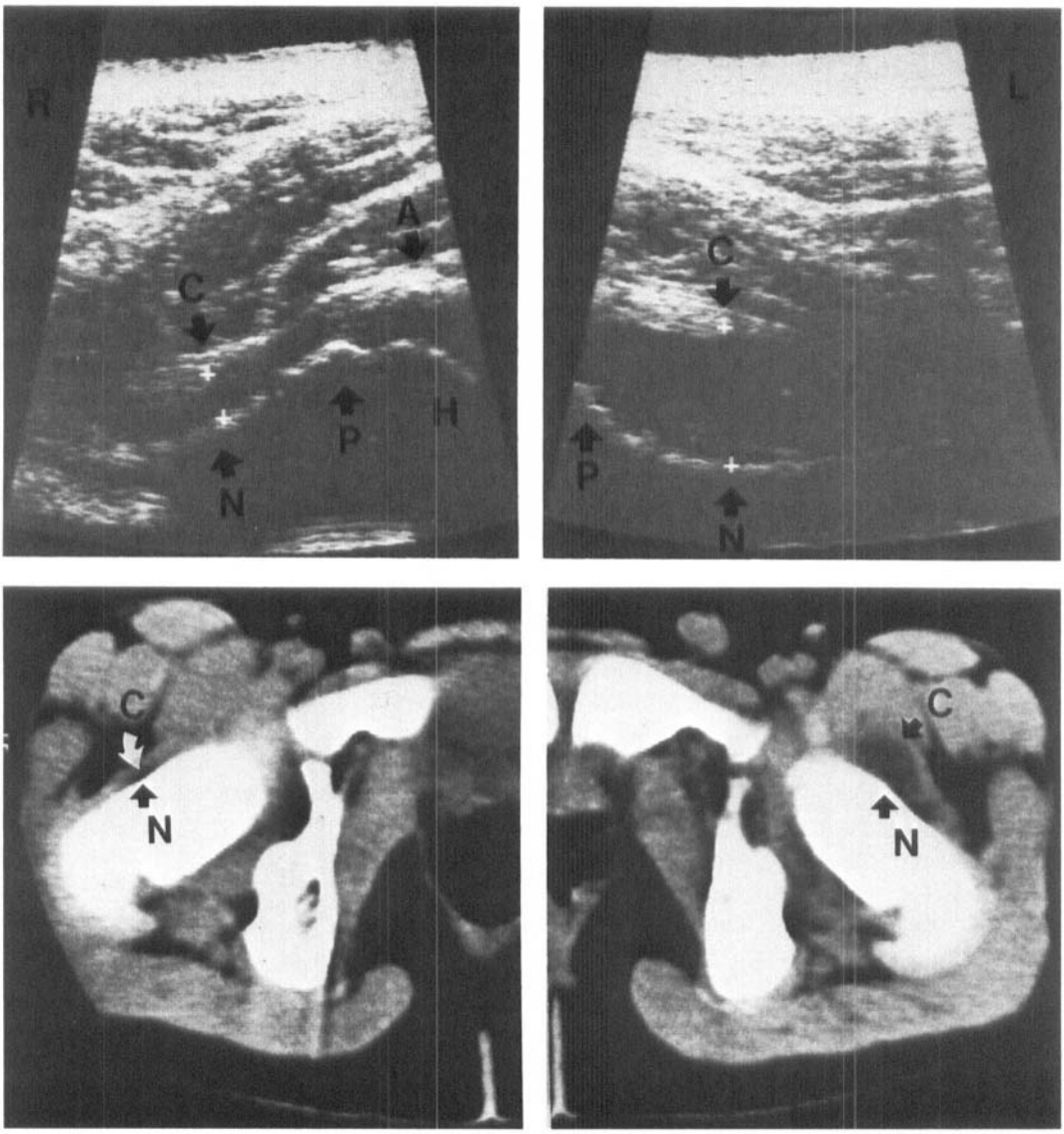

Figure 2. Ultrasonography (top) and CT (bottom) of the right normal (R) and left symptomatic (L) hips prior to aspiration. The following anatomical structures are identified on the normal right side: acetabular labrum (A), head of femur (H), growth plate (P), neck of femur (N) and joint capsule (C). On the left side, the capsule is distended 10 mm ventrally due to an effusion.

Discussion

Intracapsular pressures of 22–66 mmHg were recorded by Kloiber et al. (1983) in a series of cases of transient synovitis. A pressure of 50 mmHg, as in this case, would be enough to compromise blood flow due to venous stasis (Arnoldi et al. 1979) and has, when maintained for 12 h, produced infarction of the proximal femoral epiphysis in puppies (Woodhouse 1964). In this case scintimetry revealed an increased activity in the proximal femoral epiphysis, which is a common finding in transient synovitis (Bensahel et al. 1983). However, scintigraphic findings suggest that in some of these cases there is a transient ischaemia of the epiphysis, which is reversible either spontaneously or following joint aspiration (Suther-

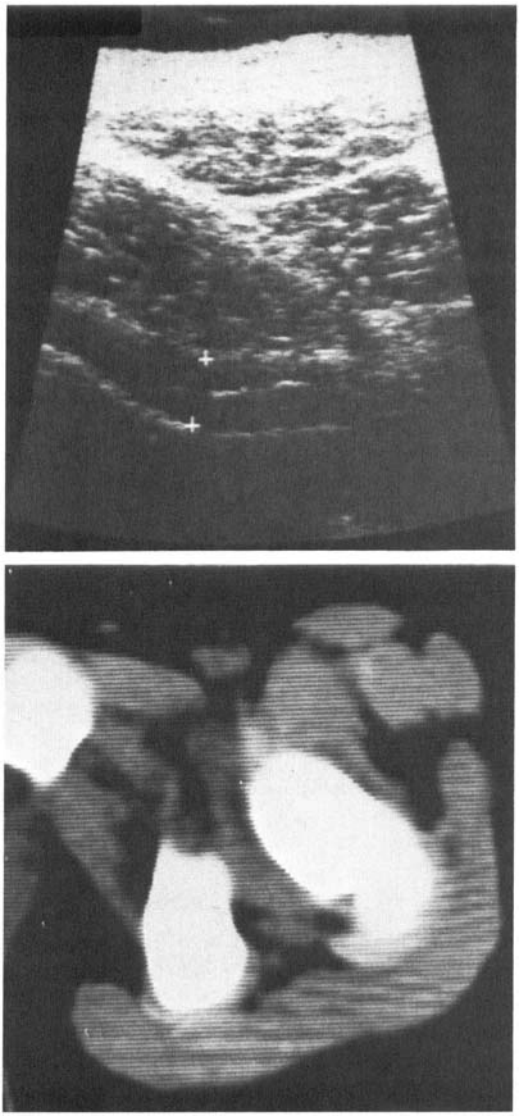

Figure 3. Ultrasonography (top) and CT (bottom) of the left hip immediately after aspiration of 5.5 ml of joint fluid. The ventral distension of the capsule has been reduced from 10 to 2 mm.

land et al. 1980, Kloiber et al. 1983). For this reason, and for palliative reasons, the diagnosis and aspiration of an effusion are desirable. Conventional radiographs do not give sufficient information in this respect (Brown 1975). In this case we have found ultrasonography to be an accurate diagnostic tool. Being non-invasive, without discomfort to the patient, and not associated with ionizing radiation, sonography allows serial examinations. This technique seems very promising in the diagnosis and follow-up of hip joint effusions in the child.

References

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