

# Ultrasound - Guided Aspiration in Suspected Sepsis of Resection Arthroplasty of the Hip Joint

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**Summary** The authors described 17 patients who had had resection arthroplasty of the hip and who were suspected of having an infection. The resection arthroplasties had been performed for previous infection. All the patients were studied by ultrasonography to detect effusion in the pseudoarticular space. Thirteen of the 17 patients were found to have an effusion by ultrasonography. Fluid was obtained in 9 of the 13 patients by ultrasonographic-guided aspiration. The mean aspirated volume was 3 ml (range 1-25 ml). Five of the 9 aspirates proved to be septic. The echopattern in all but one of those five with sepsis was nonechofree. Of four other patients in whom it was not possible to aspirate fluid lavage of the pseudoarticular space one yielded a positive culture. The role of ultrasonography in the diagnosis and management of patients who have undergone resection arthroplasty of the hip and who are suspected of having an infected pseudoarticular space is discussed.

**Key words** Resection Arthroplasty of Hip Joint, Sepsis, Ultrasonography.

## INTRODUCTION

One of the major complications of hip arthroplasty is sepsis (1). This often requires resection arthroplasty (2); however, infection may reoccur and require further treatment. It has been our practice to perform ultrasonography in all such patients in whom infection is suspected. If an effusion is present, aspiration is performed with ultrasonographic guidance. In this way we have found it possible to make an early diagnosis of sepsis and initiate prompt treatment.

## PATIENTS AND METHODS

Seventeen consecutive patients (13 males, 4 females) who had previously undergone resection arthroplasty for infection of a hip prosthesis were studied. All had clinical symptoms and signs of possible infection at the time of examination. Their age ranged from 61 to 82 years (mean 74). In all cases ultrasonographic examination was carried out with a 5 MHz convex transducer. Sonography of the musculoskeletal system we usually performed with linear probes using convex transducers. Our department does not possess a 5MHz linear transducer. Tech-

nically, it is easier to perform scanning with a convex transducer, since patients with resected hips usually have a slight flexion contracture. The resected hip was scanned anteriorly in the sagittal plane at the midpoint of a line on the retained portion of the femoral diaphysis between the greater and lesser trochanters. This plane was most consistently reproducible and provided maximal information (Fig. 1). In operated Girdlestone hips, resection of the femoral neck does not allow accurate measurement of the distance between the capsule and neck of the femur (Koski's method). We therefore used indirect methods to detect effusion: bulging of the pseudocapsule, and an echofree pattern. Both the normal and diseased hips were scanned in each patient. When effusion was detected ultrasonographic-guided aspiration was performed in the neutral position using a 20 G needle (3). The transducer was covered with a sterile glove, and sterile gel was used. The aspiration needle was inserted into the pseudoarticular space through the midpoint of the distended pseudocapsule. Aspirated fluid was cultured. When no effusion was present, joint lavage was performed using 5 ml of sterile saline to obtain material for culture. The echopattern of any effusion beyond the pseudocapsule and the aspirated volume were recorded in each patient.

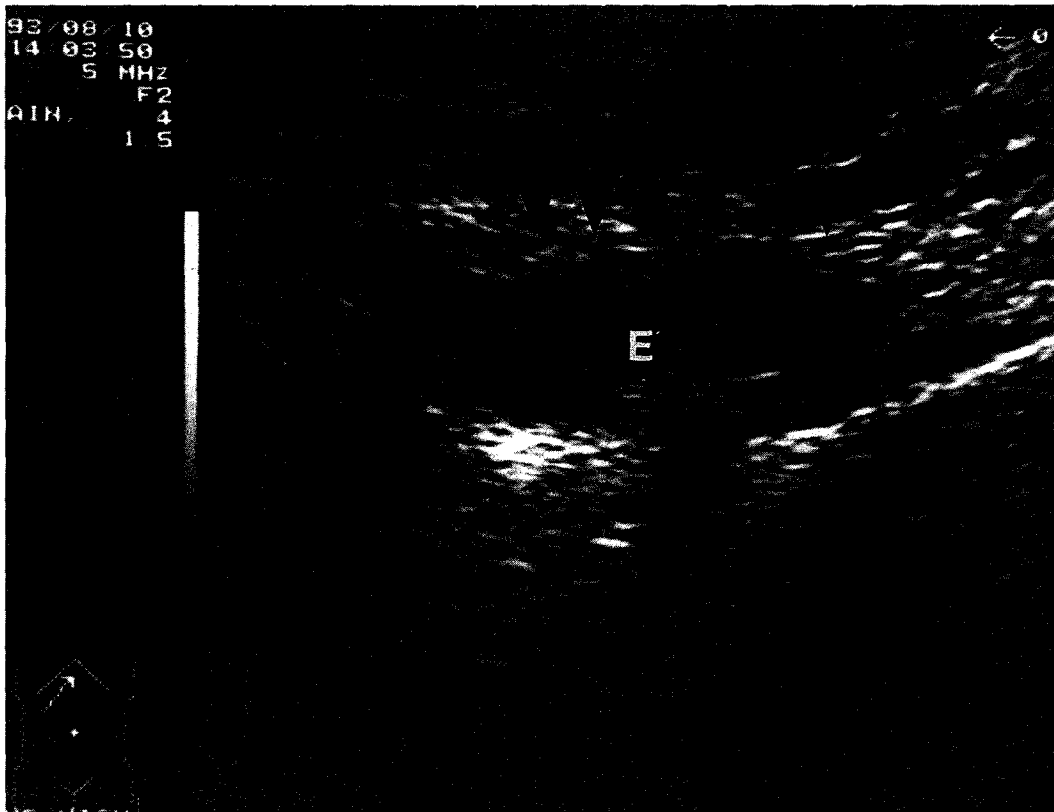


Fig. 1: Ultrasonographic evidence of effusion within the pseudocapsule in patients treated with resection arthroplasty. The echopattern was echo-free. 12 ml of effusion were aspirated and were sterile. (E- effusion, black arrows - pseudocapsule).

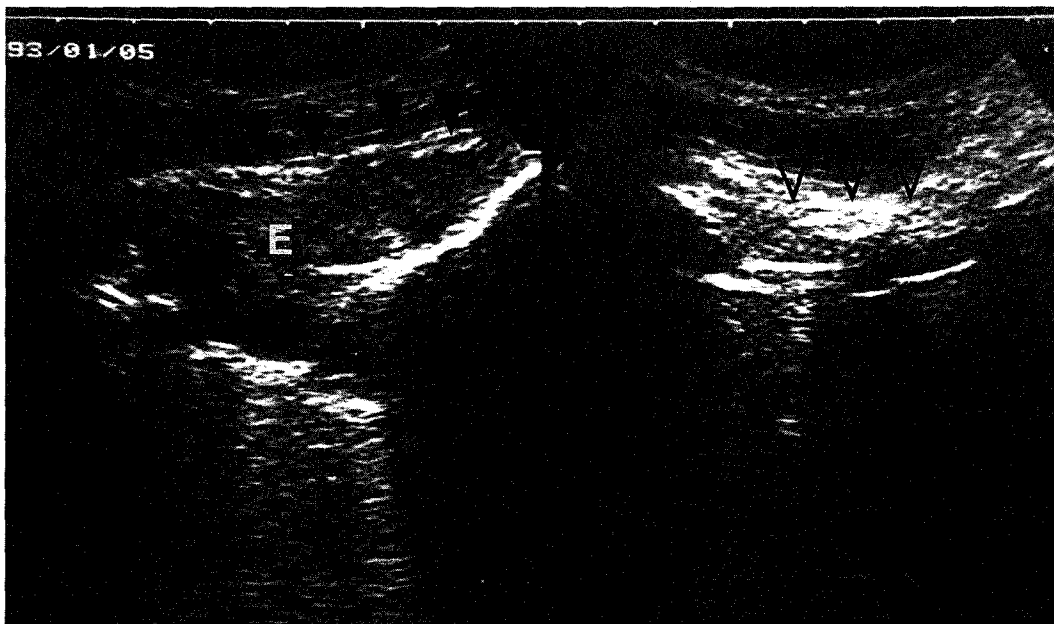


Fig. 2: Ultrasound evidence of nonechofree effusion in the patient who had bilateral hip implantation and undergone resection arthroplasty after removal of the right total hip prosthesis due to infection. Ultrasonographic-guided aspiration was performed and 5 ml effusion, which proved on culture to be infected with *Staphylococcus aureus*, was withdrawn. (E - effusion, black arrows - pseudocapsule. Ultrasound scan of the same patient on the left side showed no evidence of effusion, arrows - thick pseudocapsule formation).

## RESULTS

We were able to demonstrate an effusion in the pseudoarticular space in 13 of 17 patients. Ultrasonographic-guided aspiration was performed in 13 patients and fluid was obtained in 9, five of whom proved to be septic. The mean aspirated volume was 3 ml (range 1-25 ml). The echopattern in all but one of the septic cases were nonechogenic (Fig. 2). In one patient grossly purulent fluid proved to be sterile. Joint lavage was performed in four patients in whom no fluid was obtained on aspiration, and culture proved positive in one.

## DISCUSSION

Noninvasive assessment of the hip treated with resection arthroplasty may be difficult because infection may occur without any radiological change. High resolution ultrasonography provides an easy, noninvasive method

for diagnosing both hip joint effusion and effusion after arthroplasty (4-6). In this study we have shown that it is possible to detect effusion in patients treated with resection arthroplasty and to aspirate the pseudoarticular space with sonographic guidance. In those patients in whom no fluid was obtained on aspiration lavage with sterile saline proved helpful in identifying infection.

Sonography-guided aspiration has many advantages over arthrography, CT, and MRI. These include absence of ionizing radiation, little inconvenience to the patient, brief period for the examination and low cost. The procedure allows early diagnosis of effusion and infection so that antibiotic therapy is not delayed.

We therefore conclude that ultrasonography should be more routinely used to monitor patients suspected of having an infected resection arthroplasty. If effusion is demonstrated in the pseudoarticular space ultrasonographic-guided aspiration should be performed.

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