Sonographic Demonstration of Hyperechoic Fibrin Coating of Rice Bodies in Trochanteric Bursitis

The “Fried Rice” Pattern

Chung-Cheng Huang, MD, Sheung-Fat Ko, MD, Lin-Hsiu Weng, MD, Shu-Hang Ng, MD, Hsuan-Ying Huang, MD, Yung-Liang Wan, MD, Tze-Yu Lee, MD

Intra-articular rice body formation is generally related to synovial inflammatory conditions such as tuberculous, pyogenic, rheumatoid, or seronegative inflammatory diseases. Occasionally, it does not have any underlying disorder. Various mechanisms of pathogenesis of rice bodies have been proposed, including sloughing from the microinfarcted synovium, de novo formation in the synovial fluid, and entrapment of fibroblasts with collagen formation. Extra-articular rice body formation is unusual but may be found in bursitis or tenosynovitis. Here we report an unusual case of giant trochanteric bursitis with transmuscular dissection to the subcutaneous tissue and numerous intrabursal hypoechoic rice bodies with hyperechoic rim, simulating oil-coated fried rice. The usefulness of the sonographic probe compression technique for delineation of the dissection tract is emphasized, and the sonographic-histopathologic correlation of such a “fried rice” pattern is discussed.

Case Report

A 73-year-old female patient had a painless growing mass at the right hip and intermittent soreness of the right leg for 1 month. There was no history of trauma, pulmonary tuberculosis, or arthritis. Physical examination showed an approximately 15-cm soft, elastic, nontender mass at the lateral aspect of the right hip and upper thigh. There was no limitation of hip joint movement or abnormal discoloration of the overlying skin. The leukocyte count was normal (5800/mm³) but the C-reactive protein level was elevated (13.5 mg/L; normal, <5 mg/L). Radiographs revealed a noncalcified soft tissue mass lateral to the right hip.

Sonographic evaluation with 8L5 transducer set at 8 MHz (Acuson Sequoia 512; Siemens Medical Solutions, Mountain View, CA) revealed a well-circumscribed, thick-walled cystic mass underneath the right gluteus maximus muscle and tensor fascia lata, compatible with a distended trochanteric bursa, which communicated with a large...
subcutaneous cyst through a narrowed tract (Figure 1A). This narrowed tract became widened when the trochanteric bursa was compressed with a sonographic probe, indicating a transmuscular dissection to the subcutaneous tissue (Figure 1B). Furthermore, both cystic lesions had numerous discrete, movable, ovoid or spindle-shaped nodules with hypoechoic cores (0.5–1.5-cm) and hyperchoic rims, simulating fried rice evenly coated with oil. A color Doppler scan showed no abnormal vascularity. Huge trochanteric bursitis with transmuscular dissection to the subcutaneous tissue and intrabursal rice bodies was diagnosed. Subsequent magnetic resonance (MR) imaging showed a markedly distended trochanteric bursa with bursal wall enhancement on enhanced T1-weighted images, transmuscular dissection to the subcutaneous tissue (Figure 1C), and intrabursal rice bodies that were slightly hypointense to hyperintense to muscle on T2-weighted images. The adjacent hip bones were intact.

Surgical exploration confirmed the sonographic and MR imaging findings, and a complete excision was accomplished. Bi-section of the gross specimen revealed an inflamed bursa with a thickened synovium and multiple whitish rice bodies. Histopathologic examination showed a thick fibromembranous cyst wall with capillary proliferation. The central portion of the rice bodies was composed of homogeneous eosinophilic fibrin deposition, whereas the peripheral portion was composed of fibrin with a reticulated and laminated arrangement (Figure 1D), corresponding to the fried rice pattern on the sonogram. Results of a smear and culture of the fluid and bursal tissues were negative. A final diagnosis of trochanteric bursitis with multiple rice bodies was established. After surgery, the patient recovered well. No recurrent mass could be found at the 9-month follow-up.

Discussion

The trochanteric bursa is one of the major bursas around the greater trochanter of the femur. It lies beneath the gluteal maximus and the iliotibial tract and covers the insertion of the gluteal medius muscle.10 Trochanteric bursitis is commonly induced by tuberculous, pyogenic, rheumatoid, or seronegative inflammatory diseases. Occasionally, it is idiopathic, appearing as a slow-growing painful or painless mass around the hip. Rheumatoid or tuberculous trochanteric bursitis with dissection through the tensor fascia lata into the subcutaneous region is unusual, and only a few cases have sporadically been described.6,11,12 On rare occasion, as seen in this case, idiopathic trochanteric bursitis might be complicated with direct dissection through the gluteal maximus muscle into the subcutaneous region of the upper thigh. The diagnosis of such a rare complication could be facilitated by pertinent compression on the bursa with a sonographic probe to distend the dissection tract.

Rice bodies represent an end product of synovial inflammation, proliferation, and degeneration.1 However, the development of rice bodies is not related to disease duration and can occur early or late in the disease course.2 Microscopic examination of the rice body shows that its central core is composed of acidophilic material, and its periphery is composed of collagen and fibrin.3,4 Rice bodies characteristically manifest as ovoid, freely movable, slightly hypointense to hyperintense intra-articular nodules on T2-weighted MR images.7–9 On sonograms, rice bodies usually appear as isochic to hyperechoic nodules in the bursa and may mimic debris, blood, or viscous fluid.8,9 In this particular case, sonograms revealed numerous intrabursal hypoechoic rice bodies with a hyperechoic rim, simulating oil-coated fried rice. Histopathologically, the hypoechoic core corresponds to homogenous fibrin deposition. The hyperechoic rim corresponds to the outer layer of inhomogeneous fibrin deposition in a reticulated and laminated arrangement, engendering many interfaces with resultant hyperechogenicity.

The differential diagnosis considerations of rice bodies include synovial osteochondromatosis, pigmented villonodular synovitis or other villonodular proliferative synovial diseases, and synovial chondromatosis.3,4,7–10 In contradistinction to rice bodies, synovial osteochondromatosis typically manifests as radiopaque nodules on radiographs, hyperechoic foci with acoustic shadows on sonograms, and hypointense or central fatlike intra-articular nodules on MR imaging.10,13–16 Pigmented villonodular synovitis or other villonodular proliferative synovial disease usually appears as synovial thickening with fixed mural nodules on sonograms, and pigmented villonodular synovitis usually appears as markedly hypointense nodules on MR imaging.8 Synovial
Figure 1. A, Sonogram in a free-style oblique sagittal extended view of the thigh mass shows a flattened cystic lesion (star) between the gluteal maximus muscle (arrows) and greater trochanter (GT), suggestive of trochanteric bursitis. The mass dissects through the gluteal maximus muscle via a narrowed tract (curved arrow) into a larger subcutaneous cystic mass. Note multiple intracystic discrete round to oval rice bodies with hypoechoic cores and hyperechoic rims, simulating fried rice (arrowheads). B, Compression of the subcutaneous cystic mass with the sonographic probe results in widening of the tract (curved arrow) between the trochanteric bursa (star) and the subcutaneous cystic lesion. C, Transverse T2-weighted MR image reveals a large trochanteric bursa (star) interposing between the tensor fascia lata (arrowheads) and gluteal maximus muscle (arrows) with transmuscular dissection (open arrows) into the subcutaneous region and multiple intrabursal hypointense to hyperintense rice bodies. D, Photomicrograph of a rice body shows central homogeneous eosinophilic fibrin deposition (asterisk) and an outer mantle of fibrin with a reticulated and laminated arrangement interspersed with vacuolations (arrowheads) (hematoxylin-eosin, original magnification ×40).
chondromatosis with hyperintense intra-articular cartilaginous nodules on T2-weighted MR images may be indistinguishable from rice bodies.3,7,10,14,15 However, as demonstrated in our case, cautious identification of the so-called fried rice pattern can aid the discrimination of rice bodies from chondromatosis.

Rice bodies can induce chronic irritation. The clinical symptoms and synovial inflammatory changes may subside after effective removal of rice bodies by aspiration, lavage, or instillation of fibrinolysis-promoting agents such as urokinase.2,7 Surgical intervention can be applied for infectious entities or in cases in which aspiration and lavage are unsuccessful.14

In summary, this report describes an unusual case of giant trochanteric bursitis with transmascular dissection to the subcutaneous tissue and intrabursal rice bodies. Sonography facilitates accurate preoperative diagnosis by explicit delineation of the dissection tract and the characteristic fried rice pattern of rice bodies.

References