

Demonstration of a Malignant Soft-Tissue Lymphoma During Triple-Phase Skeletal Scintigraphy

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Malignant soft-tissue neoplasms may be demonstrated in the course of triple-phase skeletal scintigraphy due to the presence of either abnormal vascularity or calcifications. We report the unusual case of a malignant lymphoma which was detected in the vascular phases of a triple-phase skeletal scintigraphic study but was not visualized utilizing conventional radioangiographic techniques. Lymphoma should be included in the differential diagnosis of soft-tissue neoplasms demonstrable by scintiangiography.

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Malignant soft-tissue neoplasms may be demonstrated in the course of a triple-phase skeletal scintigraphic study due to the presence of either abnormal vascularity or calcifications. We report the unusual case presentation of a malignant soft-tissue lymphoma which was not detected by conventional radiographic techniques. The diagnosis was suggested by triple-phase skeletal and gallium scintigraphy and confirmed by biopsy.

CASE REPORT

A 54-yr-old white female was in her usual state of health until 1 wk prior to admission when she experienced pain and swelling of her right leg. Physical examination revealed a swollen right extremity with 4+ edema. The medial thigh was tender and warm to palpation. No lymphadenopathy was detected. A Doppler ultrasound examination elicited decreased flow in the right popliteal region and venography demonstrated the presence of right femoral vein thrombosis. A course of heparin therapy was instituted with a subsequent failure of clinical response and the patient was hospitalized for further evaluation. Repeat lower extremity venography redemonstrated venous occlusion with evidence of fresh thrombosis. A

computed tomographic (CT) scan with contrast revealed edema with prominent soft-tissue markings consistent with inflammation. There was obscuration of the normal soft-tissue planes and increased prominence of the adductor muscle group which was felt to represent hematoma formation secondary to anticoagulation. Ultrasound evaluation demonstrated diffuse swelling of the tissues of the right thigh with the presence of a joint effusion. Triple-phase skeletal scintigraphy was then performed utilizing 20 mCi technetium-99m methylene diphosphonate (Figs. 1 and 2). The vascular phases suggested the presence of a hypervascular, well-defined, soft-tissue mass in the mid-thigh with no involvement of adjacent bone on delayed views. Subsequent femoral arteriography failed to detect the presence of abnormal vascularity (Fig. 3). Scintigraphy utilizing 10 mCi gallium-67 citrate demonstrated a dumbbell-shaped soft-tissue mass which appeared to encase the femoral shaft with associated pathology in the right inguinal region (Fig. 4). CT of the pelvis confirmed the presence of common and internal iliac lymphadenopathy. Needle biopsy revealed a small-cell malignant neoplasm which electron microscopy identified as a mixed histiocytic-lymphocytic lymphoma. Appropriate systemic chemotherapy and local radiation therapy were then instituted.

DISCUSSION

The development of unilateral leg edema may present as the initial manifestation of malignant disease and a neoplastic etiology should always be considered in the

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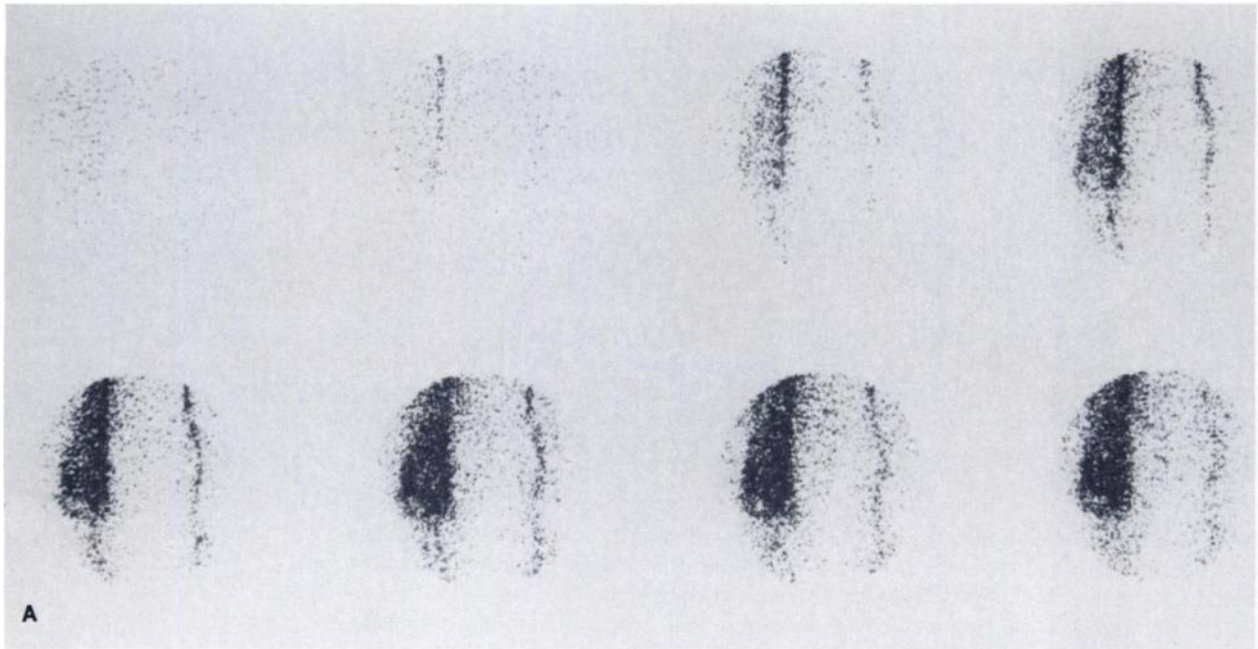


FIGURE 1
A: Arterial phase (anterior view) demonstrating marked, sharply defined hypervascularity in soft tissues of right thigh. **B:** Immediate postflow phase demonstrating persistent hypervascularity with associated soft-tissue edema of right thigh

FIGURE 2
 2-hr delayed study demonstrating moderate residual pooling of soft-tissue activity

context of failure of response to conventional therapy (1). In men, the most common neoplastic etiology appears to be carcinoma of the prostate while in women, the most common etiologies are lymphoma or possibly carcinoma of the cervix (2). The development of this condition usually denotes inguinal lymph node involvement. In this case, triple-phase skeletal scintigraphy provided the first suggestion of a neoplastic etiology by demonstrating the

presence of profuse and sharply demarcated hypervascularity (3). The reason for the negative conventional angiographic study is unclear but may relate to the size of the contrast molecule. There is a general paucity of information in the literature regarding the angiographic characteristics of lymphoma. By 1976 only ten cases had been reported (4). One quarter of lymphomas may be completely avascular and the degree of staining is generally proportional to the amount of neovascularity. Fine-caliber



FIGURE 3
Right femoral arteriogram demonstrating no evidence of abnormal vasculature



FIGURE 4
Gallium scintigraphy (posterior view) demonstrating dumbbell-shaped mass in right thigh with right pelvic involvement and associated soft-tissue edema

neovascularity has been reported which may explain the discrepancy between the scintiangiographic and radiographic studies. Gallium scintigraphy is nonspecific and may be positive in the presence of either lymphoma or sarcoma (5).

This is an unusual presentation of a malignant soft-tissue lymphoma causing obstruction of both the venous and lymphatic systems. The diagnosis was suggested primarily by nuclear medicine procedures following an initial workup which included the current radiographic diagnostic modalities of CT, ultrasound, angiography and venography.

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