Gallium Scintigraphy in Psoas Muscle Inflammation

Before the advent of modern imaging techniques, the diagnosis of psoas muscle inflammation was difficult and often required exploratory surgery (1–3). Excretory urography was relatively the most specific nonsurgical diagnostic procedure, but was unreliable and diagnosis was commonly delayed (4). The pain in psoas inflammation is often poorly localized, frequently referred to the periphery because of irritation of the lumbar-sacral plexus. Figure 1 (left) illustrates this anatomic relationship. The psoas muscle descends paravertebrally and is joined by the iliacus muscle in the pelvis. The two descend and migrate anteriorly toward the groin to insert with their conjoint tendon at the lesser trochanter of the femur. When gallium distribution reflects these relationships, a specific diagnosis of psoas inflammation can be made.

Case 1: A 56-year-old woman presented with a 5-day history of progressive, poorly localized low back pain with radiation to the left posterior hip and leg. Temperature was 100.2°F. ESR was 57, WBC 20,000, and an initial blood culture grew penicillin-sensitive *Staphylococcus aureus*. Radiographs of spine and pelvis showed no abnormalities.

Gallium scintigraphy was started on the fourth hospital day, using 5 mCi of gallium-67 citrate with images at 4, 24, and 48 hr on an Anger tomographic scanner. Anterior slices showed an oblique band of increased activity extending below the inguinal ligament, corresponding to the location of the left psoas muscle (Fig. 1, right). Posterior slices showed intense uptake in the L-4 and L-5 vertebral bodies. Lesions in this area were confirmed 8 days later by a Tc-99m MDP bone scan. Transmission computed tomography (TCT) of the lower abdomen on the seventh hospital day showed enlargement of the iliopsoas muscle and some central decrease of attenuation in the upper portion. However, it lacked the degree of attenuation reduction and the discrete appearance associated with abscess formation.

With the working diagnosis of staphylococcal psoas myositis secondary to infectious spondylitis, the patient was treated with ampicillin and penicillin, with gradual improvement in fever, leukocytosis, and pain over an interval of several weeks. The patient has remained asymptomatic during a 9-mo follow-up period. Gallium scintigraphy and TCT, repeated several months after the acute illness, were normal.

Case 2: A 31-year-old man presented with a complaint of right abdominal “fullness” of undetermined duration. No fever or constitutional symptoms were present. An easily palpable right lower quadrant mass was found on physical examination. WBC was normal. Radiographs of the spine showed discrete early destruction in L-3 and L-4 consistent with infectious spondylitis. Gallium scintigraphy was done with the same technique as in Case 1 (Fig. 2). TCT showed a massive right psoas abscess with central necrosis corresponding exactly to the findings on the gallium study. Five hundred cc of pus were aspirated under ultrasonic guidance. *Mycobacterium tuberculosis* was found on smear and culture.

Case 3: A 21-year-old man with Crohn’s disease, diagnosed 1 yr previously, presented with a 3-wk history of progressive right lower quadrant and right hip pain. He was febrile on admission. Gallium scintigraphy was done on the second hospital day with a dual-probe rectilinear scanner, 5 hr following administration of 5 mCi of gallium-67. The anterior view is shown in Fig. 3. The suspected extension of an intra-abdominal abscess into the retrofascial space with psoas involvement was confirmed by TCT. The abscess spontaneously decompressed by enteric fistula and the patient was successfully managed with multiple antibiotics.

Psoas inflammation can be difficult to locate clinically, particularly early in the course of the disease, as illustrated by Case 1. Because whole-torso surveys by TCT or ultrasound are expensive and time-consuming, the initial survey in poorly localized inflammatory disease is best made by gallium scintigraphy (5,6). Once a focus is located, either TCT or ultrasound can usually define whether soft-tissue inflammation or abscess formation is
present. As gallium resolution continues to improve, inflammatory disease confined to a single anatomic compartment is being seen with increasing frequency (7). Our cases of psoas inflammation are additional examples of compartmental localization, and in Case 1 scintigraphy led to early diagnosis and successful medical therapy before abscess formation.

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REFERENCES

Warthin’s Tumor and the I-123 Scan

Papillary cystadenoma lymphomatosum (Warthin’s tumor) is a benign growth that constitutes about 5–10% of all parotid tumors. Rarely it may be bilateral, and occasionally may be multiple in the same gland. The incidence is higher in men, with a ratio of 5:1. These tumors are usually small and not palpable; but when palpable they are soft (cystic) or mildly firm, non-tender unless infected, and may sometimes become impalpable a day or two later. When they are infected, they can be easily confused with an abscess because of their cystic consistency. Involvement of salivary glands other than parotid is rare (1).

Several workers (2) have shown that Warthin’s tumor concentrates pertechnetate (99mTcO4⁻) on salivary gland scintigraphy. Since oncocytoma also localizes pertechnetate, it is conceivable that an I-123 image should also show this tumor as increased activity, although this has not been reported. We present the following case showing a histologically proven Warthin’s tumor of the parotid gland, which gave an area of increased uptake on a radiiodine scintigram.

A 64-year-old woman had a left-lobe thyroid nodule that was treated with thyroid USP, 1 grain per day for more than a year. She presented with a nodule in right neck of 3 weeks’ duration. There was no pain or other symptom, or history of radiation to the neck. On physical examination there was a 1.5-cm nodule in the right submandibular region, moderately firm in consistency. Palpation of the thyroid showed a nodule in left lobe of thyroid, 3 cm in diameter. The right lobe was not palpable. All thyroid tests were within normal limits, and other studies noncontributory. A thyroid scintigram (Fig. 1), obtained with I-123, 200 μCi p.o., showed the large, easily palpable, functioning nodule at the lower pole of the left lobe. There were two areas of decreased radioactivity in the relatively smaller (impalpable) right lobe. A small amount of radioactivity was seen in the palpable nodule in the right submandibular region. At the time we considered the findings consistent with well-differentiated thyroid carcinoma (papillary, follicular, or mixed), with metastasis in right submandibular region—although it is uncommon for a metastasis to concentrate radioactivity in the presence of a functioning thyroid gland. With this preoperative impression, the patient underwent subtotal thyroidectomy and excision of the right submandibular nodule. The latter was found to be a tumor in the tail of the parotid gland.

FIG. 1. Sodium iodide (I-123) scintigram, showing area of radioactivity corresponding to palpable nodule in right submandibular region, which proved to be Warthin’s tumor.

FIG. 2. Section of nodule in Fig. 1, showing multiple cystic areas lined by papillary structures and scattered lymphoid follicles, characteristic of Warthin’s tumor.