Early Diagnosis of Disc-Space Infection
Using Gallium-67

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A 4-year-old boy had had progressive central lumbar pain and hamstring spasm. He had a normal lumbar-spine x-ray except for minimal L-5, S1 spondylolysis, but gave an abnormal gallium-67 scan in the region of the low lumbar spine. Eight weeks following intensive antibiotic therapy, confirmation of the diagnosis of disc-space infection was established by roentgenographic studies that demonstrated narrowing of the L 4-5 intervertebral disc space. A technetium-99m diphosphonate bone scan, performed concurrently with the gallium-67 study, was normal.


One of the more difficult diagnoses to establish in pediatric orthopedics is that of early disc-space infection. Leg pain or abdominal pain may be the presenting symptom (1) and x-ray changes are rarely present before 3 wk. In one series, 9 weeks of symptoms had been present before the diagnosis was made (2). Some authors maintain that “disc-space infection” is not really an infection at all, but an inflammation or a fracture (3). Others do not distinguish between disc involvement and involvement of the adjacent vertebral body (4). The following is a report of the diagnosis of disc-space infection by use of a gallium-67 scan. Of added significance is the positive gallium scan in the presence of a normal Tc-99m diphosphonate bone scan.

CASE REPORT

A 4-year-old boy was well until 4 wk before admission when he developed a gastrointestinal upset ascribed to “flu.” At the end of that course, he developed central lumbar pain that increased progressively, and 2 days before admission he stopped walking. Upon admission, he complained of diffuse abdominal pain without change in bowel habits. Radiographs performed by his pediatrician showed a spondylolysis at L5-S1.

Admission temperature was 100°F, and there was mild hamstring spasm. Neurologic examination was normal. There was no local tenderness over the spine. The laboratory results were as follows: WBC 6,800, 33% P, 54% L, 8 M, 4 E, and 1 B. The urinalysis showed 0–1 WBC, the ESR was 50–54, alb/glob was 4.4/3.2, Ca was 10.4, and alkaline phosphatase was 8.2. The tomogram showed a spondylolysis at L5-S1. A chest radiograph was normal. A PPD (intermediate strength) was negative. ASLO titer, blood cultures, latex fixation, Brucella and Salmonella titers, and urine culture were all negative.

Following i.v. injection of 1.5 mCi of Ga-67 citrate, a scan was performed with a large-field-of-view Anger camera, the energy windows bracketing three photopeaks (Fig. 1). It showed increased lumbar-spine uptake that persisted and increased in intensity in sequential images taken over 72 hr. A bone scan using 10 mCi of Tc-99m diphosphonate, performed 24 hr after the completion of the Ga-67 study, was normal.

The patient was treated with i.v. oxacillin for 4 wk; his sedimentation rate returned to normal and his pain disappeared. On a followup study at 3 mo he had remained afebrile and asymptomatic and his ESR had dropped to 12. Two months later, radiographs showed narrowing of the L4-5 intervertebral disc space without evidence of bone involvement.
confirming the diagnosis of disc-space disease (Fig. 2A and B).

DISCUSSION

The diagnosis of disc-space infection was made by Ga-67 citrate scanning before x-ray and Tc-99m bone-scan changes occurred. The x-ray features of disc-space infections are distinctive, although the changes may not be present until months after the onset of the symptoms (5).

Gallium-67 citrate localizes in pyogenic abscesses and has been used previously in the diagnosis of osteomyelitis (6). Technetium-99m diphosphonate has also been used in the diagnosis of osteomyelitis and has been shown to be positive as early as 2 days after the onset of the disease (7,8). Our case, with its normal Tc-99m bone scan, suggests that bone was not involved at all, thereby helping to establish disc-space involvement as an independent entity (6,9). Since vascular channels into the disc have been found present as late as age 20 or 30 (10,11), bone involvement is not necessary.

CONCLUSION

In this patient a diagnosis of disc-space infection was made on the basis of a Ga-67 scan where a negative Tc-99m scan suggested the absence of concomitant bone involvement.

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