Enhanced Bone Metabolism Induced by Acupuncture

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A 29-yr-old man with several years of back pain was referred for a bone scan. High-resolution regional spot images of the skeleton were obtained following intravenous injection of 20 mCi ^{99m}Tc-methylene diphosphonate. Posterior and lateral images of the skull showed focal increased uptake in several regions of the skull. Upon questioning, the patient stated that he had received acupuncture treatment for his back pain several times in the same regions as the increased uptake. The needle placement was confirmed by the patient's acupuncturist. Acupuncture can cause enhanced bone metabolism demonstrated by increased activity on bone scans.

Key Words: bone scan; acupuncture; technetium-99m-methylene diphosphonate; back pain

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Bone scintigraphy with ^{99m}Tc-methylene diphosphonate is a proven method in evaluating patients with chronic low back pain and is useful in identifying a broad range of pathologies including: skeletal metastases, fractures, spondylolysis, osteoid osteomas and sacroilitis (*1*). Although bone scans are extremely sensitive for skeletal abnormalities, they are also nonspecific. We report an unusual case of abnormal uptake on a bone scan related to the acupuncture used to treat the patient's symptoms and not directly related to the underlying cause of the patient's pain.

CASE REPORT

A 29-yr-old man was referred to the nuclear medicine department for evaluation of chronic low back pain. Prior plain radiographs of the spine demonstrated left-sided spondylolysis at L5/S1.

Three hours following intravenous injection of ^{99m}Tc-methylene diphosphonate, spot views of the whole body were obtained using a high-resolution gamma camera. The anterior and posterior images of the skull demonstrated three areas of focally increased uptake. No abnormalities were noted on the spine images or elsewhere, except those on the skull images. At this point, the patient's head was vigorously washed for possible contamination. Multiple repeat views of the skull again demonstrated areas of focal uptake (Fig. 1).

Upon extended questioning, the patient revealed that over the last several months he had received multiple acupuncture treatments for his back pain. The last treatment he received was 2 wk prior to the scan. When asked where the needles had been placed, the patient pointed to the exact location on his scalp where the bone scan abnormalities were. The patient also stated needles had been placed in the pinna of his ears, although these regions showed no abnormal uptake. The patient's acupuncturist was then contacted and his records confirmed that the areas of increased activity coincided directly with the locations of the acupuncture treatments, excluding the pinna of the ears.

DISCUSSION

Acupuncture has been used in the treatment of pain for over 2300 years in China (*2*) and is firmly established in the Western hemisphere as a method of pain control. This case demonstrates the importance of remembering that patients may seek medical care in many forms, often combining conventional and unconventional therapies. Occasionally, unconventional forms of treatment can cause unexpected results when modern diagnostic procedures are applied, as occurred with this patient.

The exact cause of the increased uptake on this particular bone scan is uncertain. It is known that diphosphonate uptake primarily localizes in active mineralization fronts (*3*). Thus, in this patient, the acupuncture needles must have induced enhanced bone metabolism at the site of insertion. Although acupuncture needles are not deliberately placed directly against the bony calvarium, it is probable that to induce increased activity on the bone scan, such contact occurs. In perhaps a related case, increased uptake of ^{131}I was shown in a patient with thyroid cancer who received acupuncture treatments. Small gold needles were demonstrated in the regions of the increased uptake, although findings of rheumatoid arthritis were also noted (*4*).

CONCLUSION

Although acupuncture needles are generally considered safe, various complications have been previously reported, including the development of pseudoaneurysms, pneumothoraces and skin infections (*5,6*). This particular patient did not appear to suffer any side-effects from his treatments, despite the increased activity on the bone scan.

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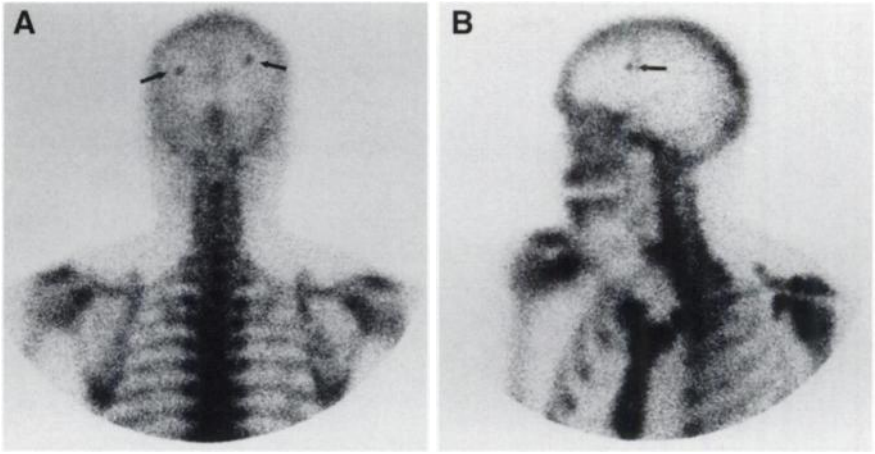

FIGURE 1. Bone scans of the skull show focal regions of increased uptake at sites of acupuncture treatment: (A) posterior and (B) right lateral views.

Regardless, misinterpretation of his scan may have led to unnecessary further evaluation, and it is therefore probably wise to add acupuncture as yet another possible cause for increased activity on bone scans.

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