
Spread of Infectious Complications of Odontogenic Abscess Detected by Technetium-99m-HMPAO-Labeled WBC Scan of Occult Sepsis in the Intensive Care Unit

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We report a rare case of odontogenic abscess, detected while the patient was in the intensive care unit (ICU), which resulted in sepsis and the patient's death due to mediastinitis, skull osteomyelitis, and deep neck cellulitis. The detection of infectious focus in occult sepsis in ICUs is usually difficult because many diagnostic procedures cannot be conveniently performed. The use of ^{99m}Tc -hexamethylpropyleneamine-oxime-labeled white blood cells scan allowed accurate diagnosis and appropriate surgical drainage.

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Despite the use of antibiotics, cases of odontogenic infections still occur when there is an initial delay in treatment, an underlying systemic disease, or because of the nature of the responsible microorganism, these inspections may result in rare and life-threatening complications (1,2). Therefore, early diagnosis and precise evaluation of the extent of the complications are very important. An easily available imaging technique that could accurately demonstrate the sites of infection in an ICU patient with occult sepsis would be of great value. Our experience encouraged the use of a ^{99m}Tc -HMPAO-WBC scan in such a case.

CASE REPORT

A 62-yr-old man suffered from a toothache for two days with swelling of the right parotid region and erythmous change of the anterior neck. Physical examination showed the swelling of the right temporal, parotid, sublingual, submental, submandibular, anterior neck, and supraclavicle regions. Pericoronitis of the lower right third molar with pus discharge was seen. Abnormal breath sounds of dullness over the right upper lung field also were noted.

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The patient developed dyspnea and hypotension, and was then admitted to the ICU with sepsis. A chest x-ray showed slight enlargement of the superior mediastinum. Technetium-99m-HMPAO-WBCs were prepared (3,4), and 4 hr after intravenous injection of 260 MBq ^{99m}Tc -HMPAO-WBC the image demonstrated significant WBC accumulation in the right temporal, parotid, submandibular regions, neck, and superior mediastinum (Fig. 1). Incision, drainage and debridement of the abscess was done with the guidance of scintigraphic findings. Bacterial culture showed growth of *Staphylococcus aureus* and *Pseudomonas aeruginosa*. In spite of antibiotic therapy, an acute respiratory distress syndrome developed and the patient died.

DISCUSSION

On rare occasions odontogenic infections result in life-threatening complications: airway obstruction, necrotizing fasciitis of the neck, rapid spread to adjacent areas such as orbit, cranium, mediastinum and thorax, as well as hematogenous dissemination (5,6). Early diagnosis of complications, prompt surgical treatment, and judicious selection of appropriate antibiotics are very important (6,7).

CT scanning has been advocated in the management of deep head and neck infections (8) and mediastinitis (9, 10), but its benefits must be weighed against the time necessary to schedule and obtain the scan (8). Gallium-67-citrate has been advocated for the detection of an infectious lesion or abscess formation, but the potential requirement for delayed images and difficulty in interpretation (11) are serious drawbacks. Indium-111-labeled-WBC scans are more accurate and provide data in a shorter time than ^{67}Ga for abscess localization (12-14). However, ^{111}In is not commonly available and is expensive, which therefore limits its application. Technetium-99m is a more desirable radionuclide since it is readily available and its photon energy is better suited for imaging with a mobile gamma camera. Because ^{99m}Tc -HMPAO is lipophilic, the agent can label WBCs similar to ^{111}In complexes, and good results have been reported (3).

Our experience suggests that the use of ^{99m}Tc -HMPAO-WBC scan should be encouraged in the ICU.

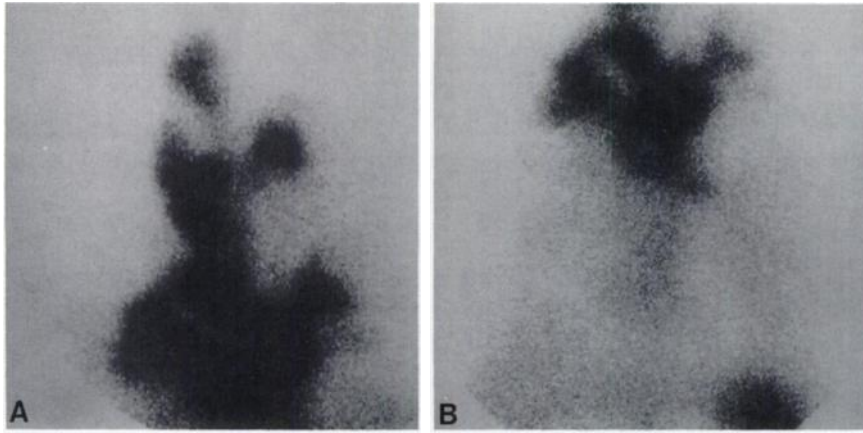


FIGURE 1. Technetium-99m-HMPAO-labeled WBC scan. (A) Anterior view of the head and neck showed intense labeled WBC accumulation in the right temporal, parotid, submental, submandibular regions and neck and (B) anterior view of the neck and chest revealed intense labeled WBC accumulation in the neck and superior mediastinum.

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