

Superimposed dual-isotope SPECT using ^{99m}Tc -hydroxymethylene diphosphonate and ^{201}Tl -chloride to assess cartilage invasion in laryngohypopharyngeal cancer

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Objective: Cartilage invasion in laryngohypopharyngeal cancer has a significant impact on the choice of treatment modality and outcome of the disease. We examined invasion of cartilage in laryngohypopharyngeal cancer by simultaneous bone and tumor dual-isotope SPECT using ^{99m}Tc -hydroxymethylene diphosphonate and ^{201}Tl -chloride. **Methods:** Early and delayed simultaneous bone and tumor dual-isotope SPECT were performed on 19 patients with laryngohypopharyngeal cancer. Dual-isotope SPECT images were superimposed to project tumor location from tumor SPECT onto the osseous structures shown by bone SPECT. The presence or absence of cartilage invasion was evaluated histopathologically or by radiological studies such as CT and/or MRI. **Results:** Histopathological or radiological examination of the cartilage revealed invasion in 5 patients and no invasion in 14 patients. The results of both early and delayed dual-isotope SPECT were exactly the same. Using dual-isotope SPECT, the sensitivity, specificity, and accuracy in detecting cartilage invasion by laryngohypopharyngeal cancer were: 80% (4/5), 92.9% (13/14), and 89.5% (17/19), respectively. **Conclusions:** Results of the present study suggest that superimposed early bone and tumor dual-isotope SPECT images may be sufficient for the diagnostic evaluation of cartilage invasion by laryngohypopharyngeal cancer. Superimposed dual-isotope SPECT imaging is a useful technique in the evaluation of cartilage invasion in laryngohypopharyngeal cancer.

Key words: superimposed dual-isotope SPECT, ^{99m}Tc -hydroxymethylene diphosphonate, ^{201}Tl -chloride, laryngohypopharyngeal cancer, cartilage invasion