Egyptian Dental Journal, 50, 59 : 66, January, 2004

VALIDITY OF SPECT IN EARLY DETECTION OF MAXILLOFACIAL INVASION BY MALIGNANT TUMOURS

Zienab Abd El Salam,* Hamed Farag,** Amr Abdel Azim*** and Maha Eshaq****

ABSTRACT

Single photon emission computed tomography (SPECT) often yields unique diagnostic information not available on planar bone scintigraphy. This study was done to assess the validity of single photon emission computed tomography in detecting early bone invasion and degree of invasion in the maxillofacial region by malignant tumours. 25 patients of both sexes and different ages having criteria of bone invasion were selected from National Cancer Institute and examined by routine radiography and SPECT examination for invasion and degree of invasion. The results revealed that there was no significant correlation between SPECT examination and bone invasion and the sensitivity was found to be 100%, specificity 25%, PVP 87.5%, PVN 100% and accuracy 88%.

INTRODUCTION AND REVIEW OF LITERATURE

Oral malignancies constitute approximately 5% of all malignant neoplasms in the body, and the vast majority of them 91% are squamous cell carcinomas. Early bone invasion is of paramount importance when treatment is considered, having also a great impact on the survival rate. Inability to detect invasion of the tumours in the bone may lead to inadequate resection, resulting in local recurrence and potential regional or distant metastasis (Kalavrezos et al, 1996).

After the introduction of skeletal scintiscanning using technetium 99m in 1971, it soon became an established method in the diagnosis of osseous malignant tumours as well as of osseous metastasis. As a functional examination based on the increase of osteoblastic and metabolic activity in bone, it complements the clinical and radiographic findings. Because of the high degree of sensitivity, changes in bone metabolism of only 5% to 15% can be detected scintigraphically. This permits an early diagnosis of osseous lesions caused by tumours. Moreover, this method is also suited for evaluating the extent of a malignant osseous process. For this purpose it is more exact than either clinical examination, which more often leads to an overestimation or plain radiographic findings, which more often result in underestimation of the process (Bradstreet et al, 1981 and Brandies& Siefert, 1995).

The disadvantages of the method are resolution and over projection by soft tissues, but they can be overcome with SPECT. SPECT uses tomographic technology to provide 3-dimensional images, which are more useful in localizing small lesions (Collier et al, 1987).

*Prof. Dr. Zienab Abd El Salam Professor of Oral Radiology Faculty of Oral and Dental Medicine, Cairo University.

**Prof. Dr. Hamed Ibrahim Farag Professor of Biophysics, Cancer Institute, Cairo University.

***Assoc. Prof. Dr Amr Abdel Azim Associate Professor of Oral radiology Faculty of Oral and Dental Medicine Cairo University.

****Dr Maha Eshaq Amer Lecturer of Oral Radiology and Diagnosis Faculty of Dentistry, Minia University