

## Dual phase <sup>99m</sup>-technetium Sestamibi imaging with single photon emission computed tomography in primary hyperparathyroidism: influence on surgery

### ABSTRACT

The purposes of this study were to determine the positive and negative predictive values of <sup>99m</sup> Technetium (<sup>99m</sup>Tc) Sestamibi dual phase imaging with single photon emission computed tomography (SPECT) for parathyroid adenomata or hyperplasia and the effect of preoperative localization on duration of surgery. We reviewed 33 adults (14 men, 19 women; mean age 53 years) with newly diagnosed primary hyperparathyroidism who underwent neck exploration. The duration of surgery for this cohort was compared with a group of historical controls (n = 53) who underwent surgery without preoperative SPECT. At surgery, there were 21 adenomata (including one carcinoma), 10 patients with hyperplasia and two with no pathology detected. The positive predictive values (PPV) for adenomata and hyperplasia were 95% and 100%, respectively. The negative predictive values (NPV) for these entities were 67% and 22%, respectively. The mean weight of adenomata detected was 3.4 g (range 0.2-17 g). Mean duration of surgery was 112.6 min as compared with 113 min in the historical controls (P = not significant). We conclude that <sup>99m</sup>Tc Sestamibi dual phase imaging with SPECT has an excellent PPV for parathyroid adenomata and hyperplasia, but does not contribute to reduced duration of surgery in patients undergoing neck exploration for the first time. The NPV is low, suggesting that a negative result does not exclude an adenoma or hyperplasia.

**Keyword:** Parathyroid; Radionuclide imaging; Surgery