



* Chandrasekaran Maharajan

* Sucharitha Vedachalam

*Madras Medical College

Parathyroid Adenoma: is Sestamibi scintigraphy mandatory?

Introduction:

Localization of parathyroid adenoma using ^{99m}Tc scintigraphy is the standard of care. However, of late, ultrasound has been employed to this end with increasing frequency.^{1, 2, 3} The employment of intra-operative PTH estimation (IOPTH) has further augmented the cure rate of hyperparathyroidism due to parathyroid adenomas.⁴ While ultrasound is widely available, scintigraphy is available only in tertiary health-care centres.

With this background, a prospective study was conducted in the department of endocrine surgery of a tertiary care hospital to analyse the efficacy of surgeon-performed ultrasound (SPUS) in comparison to that of ^{99m}Tc Sestamibi scintigraphy in the localization of parathyroid adenomas.

Patients and methods:

Prospective data which were recorded over the past 5 years in this unit were retrospectively analysed. Consecutive patients with primary hyperparathyroidism were evaluated and managed. Serum levels of calcium (Ca), parathormone (PTH), alkaline phosphatase (ALP) and phosphate (PO₄) were estimated. Levels of calcium in 24-hr urine sample were estimated. Patients with hypercalcemia with elevation of serum calcium (S.Ca) levels more than 1 mg/dl above the upper limit of normal range and elevation of serum parathormone (S.iPTH) above five times the upper limit of normal range were included in the study. After confirmation of the diagnosis with biochemical tests, they were subjected to ultrasound and scintigraphy for localization of the parathyroid adenoma. Patients in whom the

above criteria were not met were excluded from the study. Those who were included in the study were classified into 2 groups. One group (Group 1) included patients who underwent both SPUS and scintigraphy, while the other group (Group 2) included patients who underwent SPUS alone. Patients were deemed to be cured of the disease if they remained symptom-free for a period of six months after surgery, with maintenance of eucalcemia in the above-said period.

Results:

A total number of 29 patients were included in the study. The two groups were analysed with regards to mean age, S.Ca, S.iPTH, S.AIP 24-hr urinary calcium (Table 1).

In group 1, the patients were aged between 31 and 55 yrs (40 +/- 6.5). The mean serum calcium was 12.1 +/- 0.8 mg/dl (8.5 – 10.5). The mean S.iPTH was 389 +/- 45 pg/ml (15 – 65). The mean S.AIP

was 298 +/- 76 IU/L. The mean 24-hr-urinary calcium was 280 +/- 140 mg/24hrs.

In group 2, the patients were aged between 35 and 60 yrs (44 +/- 5.2).). The mean serum calcium was 12.3 +/- 0.7 mg/dl (8.5 – 10.5). The mean S.iPTH was 405 +/- 58 pg/ml (15 – 65). The mean S.AIP was 340 +/- 90 IU/L. The mean 24-hr-urinary calcium was 310 +/- 160 mg/24hrs.

There was no significant difference between the two groups with regards to these tests.

The adenoma was localized to superior parathyroid in 6 patients and to the inferior parathyroid in 9 patients in group 1. In group 2, the adenoma was localized to the superior parathyroid in 6 patients and to the inferior parathyroid in 8 patients.

There was no significant difference between the two groups with regards to the size of the adenoma, weight and post-operative levels of S.Ca (Table 2).

2 patients in group 1 and 3 patients in group 2 developed Hungry bone syndrome.

Discussion:

The success of parathyroid surgery depends upon the accuracy of localization of the adenoma. While ultrasound is widely available, scintigraphy is available only in tertiary health-care centres.

In the present study, there was no significant difference between SPUS and scintigraphy with regards to accuracy of identification of the adenoma.

Hence, on the basis of unequivocal biochemical diagnosis of parathyroid adenoma, SPUS is adequate for localization of adenoma and further management, including MIP. Scintigraphy is not a must for localization and non-availability of scintigraphy does not preclude MIP as an option for management of parathyroid adenoma.

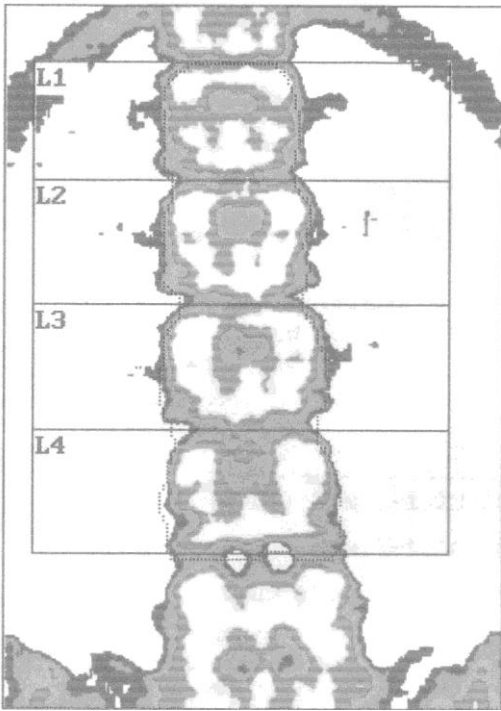


Image showing BMD before treatment

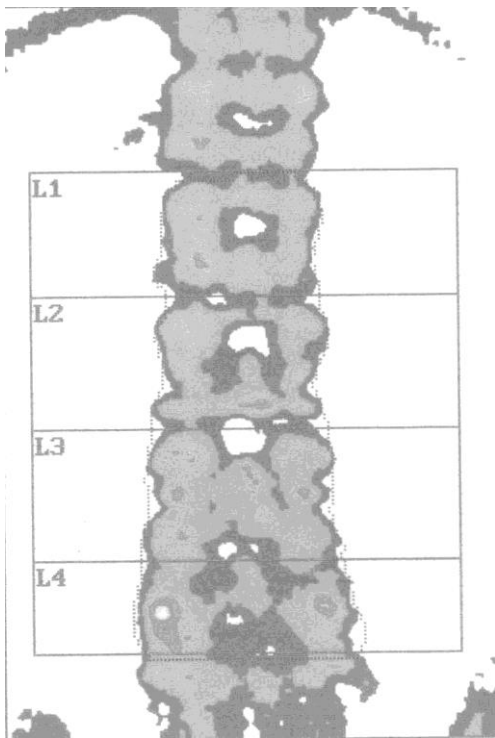


Image showing BMD after treatment

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