DUAL ASSESSMENT BY ULTRASOUND AND TECHNETIUM-99m LABELLED SESTAMIBI ISOTOPE SCAN (MIBI) AIDS MINIMALLY INVASIVE PARATHYROIDECTOMY

S Rehman, VSR Rao, E Issa, A Elsayed, AK Samy DPOWH, Grimsby, UK

Northern Lincolnshire and Goole Hospitals NHS Foundation Trust

Introduction

Pre-operative localisation techniques have aided the development of minimally invasive parathyroidectomy as a valid treatment option in the management of primary hyperparathyroidism (PHT). We set out to determine the efficacy of ultrasound (US) and technetium-99m labelled sestamibi isotope scan (MIBI) for pre-operative localisation in patients with PHT undergoing minimally invasive parathyroidectomy (MIP).

Methods

We conducted a case note based retrospective study of all patients with PHT who had pre-operative US and MIBI and underwent MIP between 2003 and 2006. Patient demographics, clinical features, biochemical profile, correlation between US, MIBI, intra-operative findings and histopathology were recorded. Surgical cure defined as normocalcaemia at 1 year follow-up was determined.

Results

30 patients (male:female=5:25) mostly in the seventh decade (median 68; range: 34-82) underwent MIP between 2003 to 2006. The majority of the patients had symptoms (18/30) and all had elevated parathormone levels (median = 13.2 pmol/l; range: 4.1 - 113.1) and calcium levels (median=2.98 mmol/l; range: 2.69-3.54). 25 patients underwent MIP, 3 had open surgery and 2 had multiple operations. Intra-operative localisation was aided by intravenous infusion of methylene blue 1 hour before surgery. Sensitivity, specificity, positive predictive value, negative predictive value and accuracy of US (63%, 33%, 89%, 9%, 60%), MIBI (79%, 0, 92%, 0, 73%) and the two modalities together (87%, 0, 87%, 0, 76%) were determined in relation to intra-op findings and histopathology. Thus a combination of US and MIBI was found to have a greater accuracy in pre-operative localisation when compared to either of the modality on their own. Three patients had to be converted to open surgery due to co-existing thyroid disease. Two patients had to undergo multiple operations due to persisting hypercalcaemia after the initial surgery. Histology confirmed parathyroid adenoma in 23 patients, nodular hyperplasia in 4 patients and normal parathyroid tissue in 3 patients. At follow-up, 3 patients were hypercalcaemic at 1 year, though the levels were below the pre-op levels.

Conclusion

MIP has changed concepts and surgical management of PHT and about 70% of PHT is managed by MIP with obvious advantages to both clinicians and patients. This has been aided by pre-operative localisation techniques such as US and MIBI. Timm et al has reported an overall sensitivity of 78% and 53% for MIBI and US respectively. MIBI & USS have been reported to have sensitivity, specificity, positive predictive value and negative predictive value of 52%, 41%, 60% & 27% respectively. With the change of surgical strategy from the traditional wide bilateral neck exploration to MIP, the combination of US & MIBI is a useful adjuvant tool in pre-operative localisation and facilitation of MIP as demonstrated in this study.

References