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## Invited Commentary

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This article reports on 90 patients in whom Thallium-Technetium isotope subtraction scanning was used as a routine preoperative localization study in patients undergoing initial neck exploration for primary hyperparathyroidism (HPT). The authors have several justifications for such an approach: most patients with HPT have a single adenoma; the technique may allow avoidance of an unnecessary exploration of the unaffected side of the neck; operating time may be reduced; and, if recurrent hypercalcemia develops, reoperation would be facilitated, since the exploration would be in an area not previously operated on (the opposite side of the neck). The authors also point out the reasons for bilateral neck exploration without preoperative localization studies: identification of the site of the adenoma and detection of multiple-gland disease (e.g., hyperplasia or double adenomas).

Contemporary biochemical testing procedures are very accurate in identifying HPT. A variety of preoperative techniques have been used over the years to localize enlarged parathyroid glands. These include real-time ultrasonography; cervical and thoracic CAT (computerized axial tomography) scanning; angiography and venous sampling; magnetic resonance imaging; and Thallium-Technetium isotope subtraction scanning. In most instances, the larger the abnormal parathyroid gland or glands, the greater the accuracy and sensitivity of these studies. To date, the "ideal" localization study has not been developed, especially one that will identify small (less than 100 mg) abnormal parathyroid glands. Despite their lack of sensitivity, preoperative localization studies have been used by experienced endocrine surgeons, generally in patients with severe hypercalcemia (e.g., a calcium level above 15 mg/dl) in whom a mediastinal exploration should be part of a failed cervical exploration, or in patients undergoing reoperation, especially those in whom an adenoma has been missed. When done by experienced surgeons, 91–95% of initial neck explorations for HPT are successful in identifying and excising abnormal parathyroid glands [1, 2]. This success exceeds the accuracy and sensitivity of currently available localization techniques. Yet, a disturbing trend that I have recently observed is that both medical endocrinologists and surgeons who perform parathyroid procedures frequently obtain preoperative localization studies before patients undergo initial neck explorations. It is hard to justify the expense of such studies given the high success rate of explorations performed by skilled, experienced endocrine surgeons.

I have several concerns about this report by Russell and colleagues. First, the Thallium-Technetium scanning technique employed lacks accuracy and sensitivity. The authors report on 90 patients, but give the scanning results for only 89. Their technique correctly identified the exact site of a parathyroid adenoma or the correct side of the neck in 51 of 89 patients—an accuracy rate of 57.3%. In 24 patients, the scans were negative; in an additional 14, the scans were falsely-positive in that they indicated disease on the side of neck in which there was none. Therefore, the sensitivity (scanned true-positives divided by the total number of positives) of their technique was 68%. The authors do not comment on these relatively low rates of accuracy and sensitivity; however, in describing their preliminary results with this technique, the authors noted a strong correlation between positive scanning results and larger adenomas (1.5 g or more) and poor results and smaller adenomas (0.49 g or less) [3].

In this article, the authors also do not explain their false-positive rate of 15.7% (14 cases). Moreover, they provide no follow-up information on the 6 patients who had persistent hypercalcemia after negative neck explorations. The authors do report a considerable reduction in operating time—an average of 26 minutes—in the patients undergoing unilateral neck explorations; however, they do not comment on the cost savings of the shorter operating time as compared with the cost of the localization scans.

Controversy continues about the extent of resection in multiple-gland HPT. Recently, Cusumano and coworkers [4] reported a 26% incidence of multiple-gland involvement in 123 patients with HPT. They also observed recurrent or persistent HPT from grossly normal-sized parathyroid glands that were found to have nodular hyperplasia on microscopical evaluation. The authors concluded that optimal surgical management of HPT is best achieved by selective removal of parathyroid glands, guided by histologic findings.

A clearer understanding of the evolution of HPT into single- or multiple-gland (nonfamilial) disease is needed. Also needed are more accurate and sensitive localization methods. Until both these needs are adequately met, I shall continue to advocate bilateral neck exploration during initial operations for HPT, with excision of diseased glands and biopsy study of at least 1 of the remaining normal-appearing glands.

## References

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