

Medical > Ex Vivo > Surgery & Pathology

24

A Novel, Noninvasive Technique for Intraoperative Assessment of Parathyroid Glands: Confocal Reflectance Microscopy

White WM, Tearney G, Pilch B, Fabian RL, Anderson RR, Gaz R.; *Surgery*. Dec 2000; 128(6):1088-1101; discussion 1100-1. DOI: 10.1067/msy.2000.111190.

ABSTRACT

BACKGROUND: Successful surgical management of primary hyperparathyroidism requires the ability to identify and distinguish normal from abnormal parathyroid tissue. Microscopic pathologic confirmation often helps with the diagnoses and decisions regarding the extent of parathyroid resection. Confocal reflectance microscopy (CRM) is an optical method of noninvasively imaging tissue without fixation, sectioning, and staining as in standard histopathology. The goal of this study was to determine if CRM imaging could be used to distinguish normal from diseased parathyroid tissue intraoperatively.

METHODS: In this study, 44 parathyroid glands from 21 patients undergoing operations for primary hyperparathyroidism were imaged immediately after excision. CRM images were compared with conventional hematoxylin-and-eosin stained sections obtained from the same gland. The percentage area occupied by fat cells was calculated in images of both normal and diseased glands.

RESULTS: Characteristic microscopic features of parathyroid glands were distinguishable by CRM and correlated well with histopathology. The stromal fat content of normal and diseased glands could easily be determined. The percentage area occupied by fat cells differed significantly ($P < .00001$) in normal glands (average, 23.0% +/- 10.9%) and adenomatous glands (average, 0.4% +/- 0.7%).

CONCLUSIONS: CRM imaging rapidly revealed microscopic features that reliably differentiated normal and diseased parathyroid glands. The success of this preliminary ex vivo study promotes interest in further development of an in situ probe for in vivo clinical diagnostic use.