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Invited Commentary

The best localization is an experienced parathyroid surgeon

Prior to recent advancements in parathyroid imaging and the development of intraoperative parathyroid hormone (ioPTH) monitoring, bilateral exploration (BE) of all four parathyroid glands was the gold standard for the intraoperative management of primary hyperparathyroidism (pHPT). Modern imaging modalities, such as 99-Tc Sestamibi (with or without SPECT), high-resolution cervical ultrasonography, and 4D-CT, provides surgeons with detailed information for preoperative planning. Although there is no consensus on which imaging modality should be obtained prior to parathyroidectomy, a localizing ('positive') study allows for a planned minimally invasive parathyroidectomy (MIP) with ioPTH monitoring.[1,2] BE stills remains the operation of choice in patients who are high risk for multigland disease (MGD), as imaging is less accurate in these cases.[2–4] Given the wide variability in regional imaging accuracy, recent guidelines on the management of pHPT by the American Association of Endocrine Surgeons (AAES) recommends that decisions regarding parathyroid imaging be at the discretion of an experienced clinician who has knowledge of local imaging capabilities.[2]

In their recent publication, Fazendin et al. performed a retrospective review of 2057 patients undergoing parathyroidectomy for pHPT, and examined the preoperative imaging, operative approach, complication rates, and cure rates. They found that unilateral exploration was performed more often in patients with 'positive' preoperative imaging (63 v. 13%, $p < 0.001$). They also found MGD was more likely in patients with normocalcemic hyperparathyroidism and in those that did not have preoperative imaging ($p < 0.001$). Preoperative imaging did not have an effect on cure rates, recurrent hyperparathyroidism, or complication rates.[5]

When comparing outcomes of patients who underwent MIP to those who underwent BE, Schneider et al. found that those who underwent BE had lower long-term recurrence rates.[6] In the present study, Fazendin et al. did not note a significant difference in the recurrence rates between the imaging groups. It has been suggested higher rates of MGD may be seen in patients who have had BE at the time of parathyroidectomy, because all four glands are seen and the *in situ* size of the glands is relatively subjective. However, in the Fazendin et al. study, the similarity in cure rates and recurrence may be a reflection of the mixed surgical approach within groups more so than the preoperative imaging, as not every patient who underwent parathyroidectomy without imaging had a four-gland exploration.

Additionally, the majority of the patients who did not have imaging were in treated in the more recent past; longer-term outcomes for this more recently treated subgroup is needed to determine the true impact imaging may have on durable cure. This brings into question the definition of biochemical cure and the long-term patient follow-up. The current study defines cure only at 6 months; while this is the standard definition to differentiate between persistent and recurrent disease, without long-term follow-up data, it is difficult to ascertain true recurrence rates in this study population.

In their cohort of over 2000 cases, preoperative imaging was performed in 97% of the initial 1540 (75%) cases, while only 75% of the patients in the later 517 (25%) cases underwent preoperative imaging. With experience and more frequent BE, some parathyroid surgeons note that despite appropriate drop in ioPTH with adenoma resection, anatomically enlarged parathyroid glands may remain *in situ*, placing patients at risk for recurrence.[6] Fazendin et al. demonstrate that a surgeon experienced with the treatment of parathyroid disease may surpass the need for prescribed preoperative imaging protocols. We recommend that parathyroid surgeons take into consideration the local availability and accuracy of parathyroid imaging studies and critically evaluate their own surgical outcomes when deciding whether or not to obtain parathyroid imaging.

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