Post-machine operative time and TAT were obtained from manual catalogs. Cost of pre-and post-machine operations were calculated via a cost model (Fig. 1).

**RESULTS:** There were 285 patients reviewed, the majority of whom had primary hyperparathyroidism. Post-machine, operative time decreased from 69 minutes (interquartile range [IQR] 60-84 minutes) to 57 minutes (IQR 50-84.5 minutes), \( p=0.03 \). Additionally, TAT for 5 IOPTH values (Pre-op, 0, 5, 10, and 15 minutes) improved post-machine: pre: 29 minutes (IQR 23-40) vs 18 minutes (IQR 17-23.5), \( p<0.001 \); Time 0: 33 minutes (IQR 27-39) vs 18.5 minutes (IQR 17-22.5), \( p<0.001 \); 5 minutes: 32 minutes (IQR 26-36) vs 20 minutes (IQR 17-21), \( p<0.001 \); 10 minutes: 32 minutes (IQR 25-35) vs 22 minutes (IQR 18.5-22.5), \( p<0.001 \); 15 minutes: 30 minutes (IQR 26-36) vs 19 minutes (IQR 17-21), \( p<0.001 \). Total costs pre- and post-machine were $4,442 and $4,111. With $331 cost-reduction/case and 127 cases/year, the IOPTH machine pays for itself in 3 years, or 378 cases/year, and saves $168,589 in the remaining 4-year lifespan.

**CONCLUSION:** Use of an operating room-based machine for parathyroidectomies may lead to improved operating productivity by decreasing lab TAT, operative time, and cost.

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**Near-Infrared Autofluorescence of Adrenal Glands**

**INTRODUCTION:** After parathyroids were demonstrated to possess a natural near-infrared (NIR) autofluorescence, several groups have shown improved intraoperative identification, leading to 2 FDA-approved devices. Adrenal glands are another endocrine organ that can be difficult to distinguish from their surrounding fat, particularly on the left side. Removing all adrenal tissue is particularly important during surgery for inherited syndromes or ACTH-dependent hypercortisolism. We hypothesized that adrenal tissue may also possess NIR autofluorescence.

**METHODS:** We examined resected adrenal specimens with an NIR camera from patients undergoing robotic adrenalectomy between 1/1/2020 and 1/27/2021. None of the patients received a fluorescent dye. Images were analyzed with ImageJ software. Tissue was examined with an Olympus FV3000 confocal microscope.

**RESULTS:** Resected tissue from 23 patients were examined, including pheochromocytomas (n=6), hyperaldosteronism (n=4), hypercortisolism (n=9), and a growing or suspicious mass (n=4). In all 23 cases, the adrenal gland demonstrated strong NIR autofluorescence (Fig. Part A). The intensity ratio compared to background from gross images revealed a ratio for normal adrenal tissue of \( 1.99/C6^{0.5} \) compared to adjacent fat of \( 1.23/C6^{0.2} \). Fluorescence from adrenal tumors was variable (B,C), but sectioned cortisol-producing tumors had the highest fluorescence: \( 3.14/C6^{0.4} \). Microscopic imaging of normal adrenal tissue localized autofluorescence to the cytosol and extracellular space (D).

**CONCLUSION:** Normal adrenal tissue possesses a natural autofluorescence in the near-infrared spectrum, which can be imaged real-time in the operating room. Use of NIR cameras may help in the identification and complete removal of all adrenal tissue during surgery.

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**Preoperative 4D CT Scan Facilitates Localization of Small and Ectopic Parathyroid Adenomas in Primary Hyperparathyroidism**

**INTRODUCTION:** 4D-CT imaging is increasingly used as a preoperative localization study for primary hyperparathyroidism, but no large series exists describing its utility and accuracy.

**METHODS:** We performed a retrospective review, which identified patients who underwent surgery for primary hyperparathyroidism consecutively from 2014-2020. Those without 4D-CT (2019-2020) served as a control group. We compared the clinicopathologic features, preoperative localization imaging results,