

Subtotal Parathyroidectomy Under Indocyanine Green Angiography

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Abstract

Introduction: Subtotal parathyroid resection is indicated when secondary or tertiary hyperparathyroidism (HPT) develops and may be indicated also in patients with primary HPT and multiglandular disease. Three different surgical procedures are used to treat diffuse parathyroid hyperplasia: total parathyroidectomy with or without autotransplantation, and subtotal parathyroidectomy. One of the main complications is transient or persistent hypoparathyroidism. In this video, we show our technique of subtotal parathyroidectomy using a fluorescent dye (indocyanine green [ICG]) to check for the vascularization of the parathyroid remnant, to avoid definitive postoperative hypoparathyroidism.

Methods: We present a 64-year-old man with end-stage chronic kidney disease dialyzed since 2008. His parathyroid hormone (PTH) level was 106 pmol/L, corrected calcium level was 2.29 mmol/L and phosphate 1.63 mmol/L under maximal medical treatment, and he had significant bone disease. A subtotal parathyroidectomy was scheduled. After reclining pre-thyroid muscles, we medialized the right thyroid lobe to expose the right parathyroid glands. The superior one was a good candidate to be preserved partially because it looked hyperplastic, but without a macroscopic nodule and was the smallest of the four parathyroid glands. The inferior one was located deep in the mediastinum, in the thymus, and was therefore not suitable for subtotal resection. The procedure was the same for the left side. The inferior parathyroid gland harbored nodular hyperplasia and, therefore, was not very suitable for partial resection, but the superior one looked as a good candidate for subtotal resection too. We started reducing the volume of the parathyroid glands with clips, preserving carefully each parathyroid's vascular pedicle. Then, we intravenously injected 3.5 mL of indocyanine green solution to check the perfusion of

the parathyroid remnant, using a fluorescent imaging camera (PINPOINT camera; Novadaq, Mississauga, ON, Canada). The perfusion can be seen as green or white, depending on the selected image mode. We finally chose the right superior parathyroid gland and resected the gland outside of the clips. The other glands have finally been entirely removed.

Results: The postoperative course was uneventful except for hypocalcemia needing intravenous calcium for 48 hours. On the first postoperative day, corrected calcium level was 1.93 mmol/L and PTH level was 8 pmol/L. The two inferior parathyroid glands showed nodular hyperplasia at pathologic examination and the two superior glands showed diffuse hyperplasia without nodules.

Conclusion: With this new procedure, subtotal parathyroidectomy under ICG angiography, we can check for the good vascularization of the parathyroid remnant before resecting the other parathyroid glands. Therefore, we can intraoperatively guarantee the absence of definitive hypoparathyroidism. This technique is safe, reproducible, and its easy use makes it the procedure of choice in these situations, when the device is available.

No competing financial interests exist.

Runtime of video: 6 mins 33 secs

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