

# The Value of Intraoperative Sonographic Evaluation of Neck in Primary Hyperparathyroidism: Case Report of Preoperative Double Adenoma Upgraded to Triple Intraoperatively



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## Background

Primary hyperparathyroidism (PHPT), caused by increased parathyroid hormone (PTH) secretion, leads to generalized disorder of bone metabolism characterized with hypercalcemia and hypophosphatemia. Causes of PHPT include solitary parathyroid adenoma (80%), primary parathyroid hyperplasia (10-15%), parathyroid carcinoma (1-2%). Other rare cause is double parathyroid adenomas (DPA) with frequency less than 1-2%, which can be sporadic or familial. DPA should be considered for persistent or recurrent PHTP cases.

## Case Report

A forty-five years old female patient with Type 2 diabetes was admitted with weakness, fatigue and generalized bone pain. She had a history nephrolithiasis five times in the last two years. In laboratory examination, serum calcium level was 12.3 mg/dL (8.8-10.6), phosphorus level was 2.9 (2.4-5.1) mg / dL, albumin level was 4.1 (3.5-5.3) g / dL, PTH level was 237 (12-88) pg / mL, alkaline phosphatase was 99 IU/L (60-105 IU/L), 25 OH vitamin D level was 6.4 ng/mL (20-30 ng/mL), 24-hour urine calcium was 483 mg / day, creatinine clearance was 75 ml/minute, and prolactin level was 26 ng/mL (5-26 ng/mL). Intravenous saline and furosemide treatment was administered. Bone densitometry measurement was showed osteoporosis. Neck ultrasound imaging revealed no abnormality in the thyroid gland with bilateral smooth, ovoid, hypoechoic lesion considered parathyroid adenomas at inferior contiguity of thyroid gland in size of 15 \* 11 \* 8 mm on the right and 18 \* 12 \* 7 mm on the left side (Figure 1). Tc99m-MIBI scan detected parathyroid adenoma in the lower part of the left thyroid lobe consistent with radioactivity uptake, while in the lower part of the right thyroid was suspicious (Figure 2). PTH level from fine needle aspiration material of parathyroid washout was measured 2097 pg/mL from the right side and 1989 pg/ml from left side. Hence, bilateral minimally invasive parathyroidectomy was intended to be performed, but the surgeon saw a third adenoma at retrosternal location by using intraoperative ultrasonography (US), all were removed and pathology report was consistent with parathyroid adenoma (Figure 3).

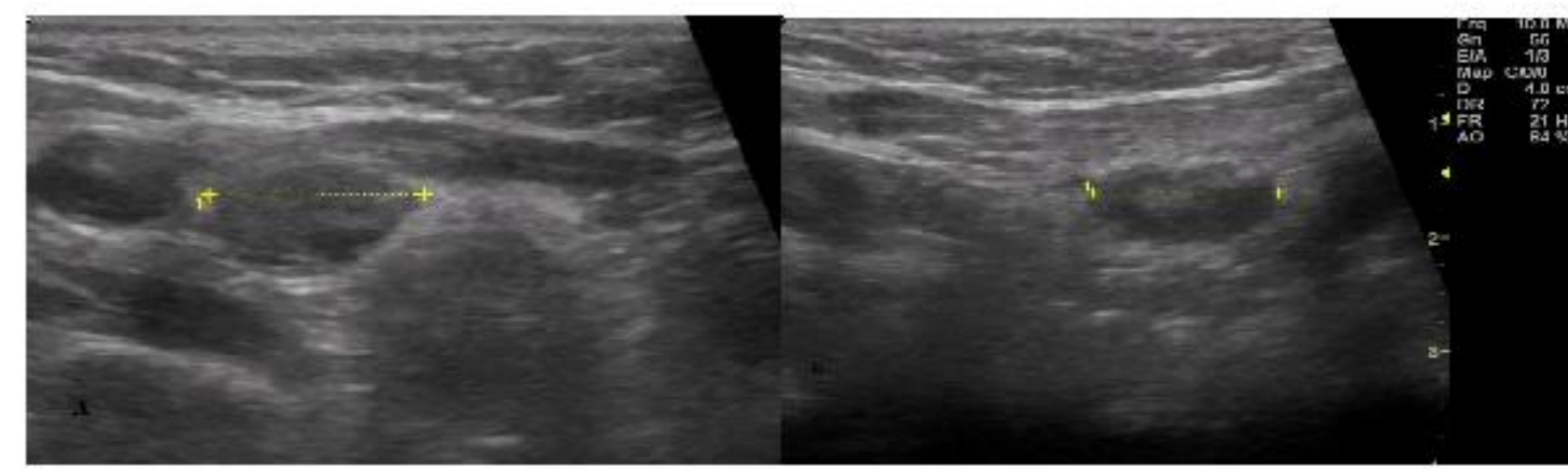


Figure 1: Right parathyroid adenoma in A image and left parathyroid adenoma in B image.

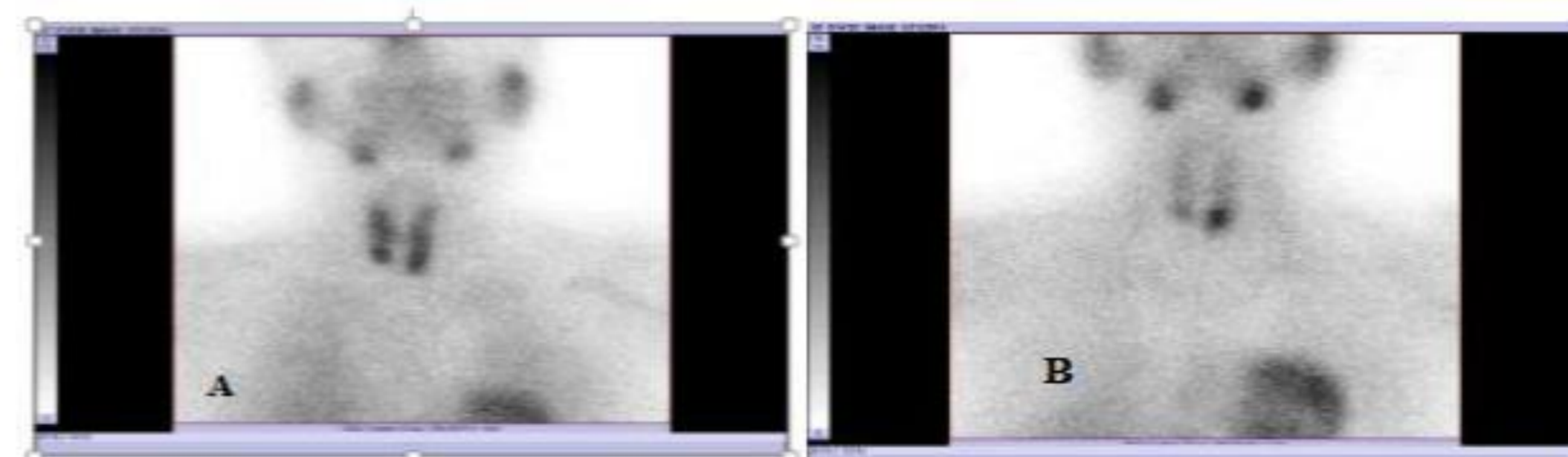


Figure 2: Early phase of parathyroid scintigraphy in A image and late phase of parathyroid scintigraphy in B image

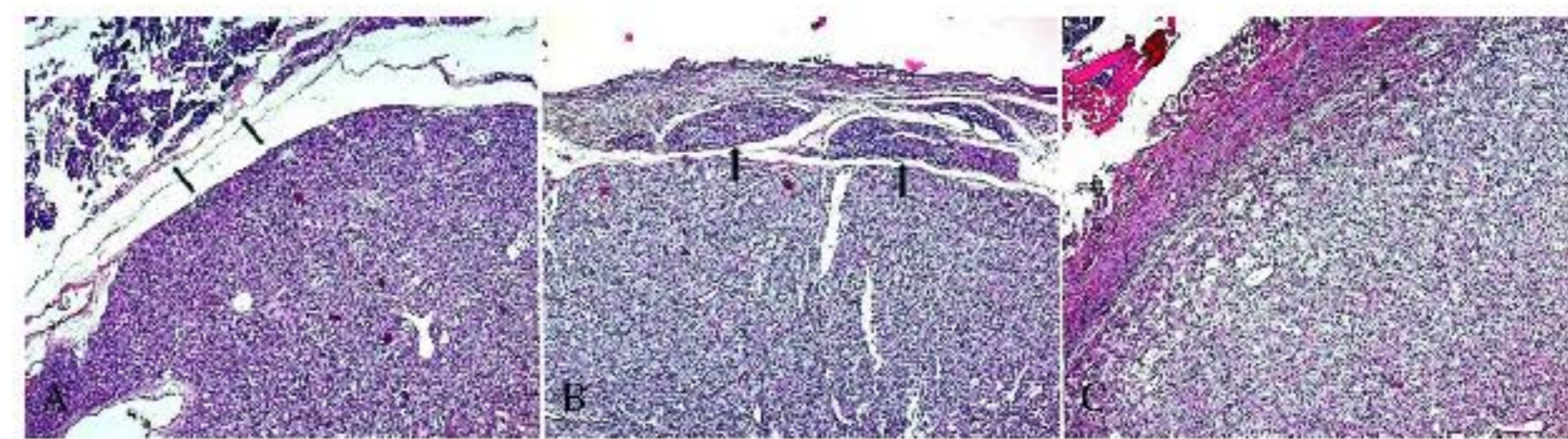


Figure 3: Three parathyroid adenomas predominantly composed of chief cells (A) and clear cells (B and C). Note the normal parathyroid tissue on the top left in A (thin arrows) and compressed normal parathyroid remnants on the top in B (thick arrows).

## Conclusion

Intraoperative parathyroid evaluation by US plays an important role preventing patient from unnecessary surgery

