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## **EVALUATION OF “ROLL-LIKE” PROCEDURE FOR MINIMALLY-INVASIVE RADIOGUIDED PARATHYROIDECTOMY (MIRP) IN HYPERPARATHYROIDISM (HPT)**

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### **BACKGROUND-AIM**

HPT is one of the most common endocrine disorders and a single adenoma is responsible for the majority of primary HPT cases (>85%).

MIRP is usually coupled with MIBI imaging for preoperative parathyroid localization and intraoperative guidance.

Aim of our study was to evaluate the feasibility and validity of MIRP performed with tracer injection inside the parathyroid, likewise the established ROLL method in non-palpable breast lesions.

### **METHODS**

Twenty HPT patients (pts) addressed to parathyroidectomy were studied (15F 5M, median age 63.5±14.5yo).

All pts had previous ultrasound (US) detection of 1 hypoechoic nodule consistent with enlarged parathyroid as confirmed by dual-tracer parathyroid scintigraphy (PS) and/or fine needle aspiration.

The day before surgery all pts underwent US-guided injection of Nanocoll® (not MAA because colloid was already prepared for breast ROLLs) inside the parathyroid for preoperative localization (median activity 60±23MBq in 0.2ml) with subsequent scintigraphic planar image.

The same surgeon performed all MIRPs using a gamma-probe for radioguided surgery in order to identify the gland and verify complete excision by checking the absence of any residual activity in the surgical field.

Intraoperative quick PTH assay (ioPTH) was carried out to further assess complete removal, followed by histologic examination of surgical specimens.

### **RESULTS**

In all pts: a) scintigraphy at a median time of 75±45min from injection depicted a focal active spot in the anterior cervical region (in 2pts uptake was also found in 1 laterocervical lymph node without interference with MIRP); b) in MIRP the active gland was identified and removed with no residual activity in the surgical field; c) ioPTH confirmed complete removal (level reduction>50%).

Post-surgical histology demonstrated the presence of parathyroid gland in all specimens: adenoma in 11/20pts (55%), hyperplasia in 9/20 (45%).

In 18pts a PS had been performed prior to MIRP resulting negative in 3 (17% - 3 small adenoma cases) and positive for 1 enlarged parathyroid in 15pts (83%).

### **CONCLUSION**

Despite the limited series presented, in our study “ROLL-like” procedure for MIRP resulted feasible, reliable and reproducible with a 100% surgical success rate in HPT pts with single gland pathology.

Advantages of the technique appear to be: a) absence of background activity that makes it easier for surgeon to identify and check the complete removal of the active gland without checking for >20% higher counts than background established for MIBI-based guidance; b) low activity of 37-74MBq injected the day before surgery vs. 37-740MBq injected 1-3hours prior to surgery, tying surgical timing, reported in literature for MIBI; c) preoperative localization even in cases of negative PS.

However, highly skilled operators are needed to ensure a valid injection and a thorough surgical removal.

Further studies are needed in order to better define pts that may benefit from this approach.