

## Super Selective Venous Sampling as Diagnostic Method in Case of Persistent Primary Hyperparathyroidism

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**Introduction.** Parathyroidectomy is the only cure for primary hyperparathyroidism (PHPT). Failure of procedure mainly is associated with multi glandular disease or atopic localisation of parathyroid glands. Persistent hypercalcemia ( $\leq 6$  month postoperatively) is associated with serious chronic conditions as nephrolithiasis, renal failure and recurrent pancreatitis. The cornerstone of persistent disease cure is localisation of pathologic gland. In case of unsuccessful localisation by repeated US, scintigraphy, CT, MRI, it can be achieved by super selective venous sampling (SSVS) with conjunction of quick PTH assay.

**Aim, Material and Methods.** Literature review and case report has been performed to highlight super SSVS in conjunction with quick PTH role in diagnostics and treatment of persistent PHPT.

**Results.** Female (33 y) with gallstone disease, recurrent pancreatitis and first diagnosed PHPT in 2011. PTH - 511.4 pg/ml and Ca - 3.35 mmol/l were detected during hospitalisation. Neck US was negative. Nevertheless, PHPT was highly suspected. In 2012, a patient was admitted to hospital for bilateral neck exploration. PTH level was 393.0 pg/ml at the admission. Preoperative US and scintigraphy was negative. SPECT/CT and MRI were suspicious for adenoma in jugular fossa. During operation, right side parathyroid adenoma and left thyrothymic ligament extirpation were done. Morphology confirmed diagnosis of the right side adenoma. Nevertheless, cutoff gradient of twice baseline was not achieved - PTH was 383 pg/ml.

In 2013, reoperation-cervicotomy, left side exploration and left thyroid lobe extirpation were performed. No suspicious parathyroid glands on the left side were found. Postoperative PTH and Ca remained elevated. In 2015, in order to localise hyperfunctioning parathyroid gland, the patient underwent SVS with PTH assay. Blood samples from thoracic and cervical veins were collected according to protocol. Highest PTH - 523 pg/ml was identified in blood sample from origin of right subclavian vein. To determine a more precise localisation patient was assigned for SSVS. SSVS revealed the highest PTH - 9179.25 pg/ml. Afterwards, repeated CT evaluation revealed suspicious adenoma in the right side retrotracheal - paraesophageal-paravertebral space. Repeated cervicotomy and focused exploration was done. Atypically localised adenoma  $2 \times 0.9 \times 0.5$  cm was extirpated. PTH decreased from 239.8 pg/ml to 59.1 pg/ml postoperatively.

**Conclusions.** SSVS in conjunction with PTH assay is safe and effective diagnostic method for localisation of hyperfunctioning parathyroid glands before remedial parathyroid surgery in patients with persistent PHPT. Repeated parathyroid operation success rate after SSVS in literature is reviewed up to 100%.