Parathyroid gland scintigraphy , ultrasound diagnostic value of parathyroid adenoma diagnosis .

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Objective: To evaluate the preoperative parathyroid adenoma diagnosis at HLUHSKK.

Goals:

1. Clinical indications for parathyroid gland diagnosis with the application of imaging studies: US and imige scintigraphy.

2. Pre-surgery parathyroid gland diagnosis by US and scintigraphy.

3. Comparison of surgery and image study findings.

Methodology: During the retrospective analysis the cases of parathyroid adenoma diagnosed at HLUHS Kaunas Clinics during a five year period (2009 to 2013) was carried out. The data used for the study: laboratory tests of Ca, Ca (jon.), PTH .For the diagnosis of parathyroid adenomas a US study as a more sensitive visual test method was chosen. The data determining formations in the neck, similar to parathyroid adenoma, using US test for its specificity assessing parathyroid adenomas complemented by perfusion scintigraphy 99mTc - MIBI .., was evaluated in this study. In the data of this study, supposed accumulation of radiopharmaceuticals

(99mTc - MIBI), which was found during US testing, was evaluated. Accumulation of radiopharmaceuticals (99mTc - MIBI) in formations was evaluated, as a characteristic of parathyroid adenoma.

Comparison of the found parathyroid adenoma size determined during US, radionuclide scintigraphy and discovered during a surgery, was carried out in the study.

The quantitative data was expressed as a percentage; the qualitative data analysis was performed using SPSS v17 and Microsoft Excel programs. Statistical calculations are based on reliability level $p < 0.05$.

Results:

Total n = 107 investigated cases: 85.98 per cent (N = 92) were women, 14.2 per cent (n = 15) men (1 picture). The mean age of women was 59.05 ± 12:37 years, the mean age of men 48.27 ± 13, 20 years. The total of patients‘ average age was 57.54 ±12.98 years(2 picture).For 64 patients examined for thyroid pathologies using US the formations found near thyroid were similar to parathyroid adenomas. These determined random cases (incidentals) accounted for 60 percent of the examined patients. In 40 percent of the patients examined for suspected primary hyperparathyroidism (Ca, PTH - increase, kidney stones, osteoporosis) the US study revealed enlarged parathyroid glands(3 picture).

US examination results were grouped into four categories based on the defined formation size: group I (0 - 1 cm) were - 7 per cent (n = 18), group II (1-2 cm) were - 46 per cent (n = 56), group III (2-3 cm) - 22 per cent (n = 18), group IV (> 3 cm) - 25 per cent (n = 15) (4 picture). The majority of the formations fell under group II. Using the US test method parathyroid adenoma was defined in all studied patients (100 per cent), and scintigraphic examination revealed parathyroid adenomas in 88 patients (82.24 per cent); in 19 patients (17.76 percent) parathyroid adenomas was not detected (5 picture).

While comparing the data obtained during the surgery and US examination and scintigraphy data, the conformance of the data is 98.4 percent. The average of the formation size defined by the US examination in comparison with the formation size found during the surgery differs insignificantly: - p =0,856 no statistically significant mean difference was found. It is observed that the size of formations correlated with Ca and PTH levels in blood serum: Ca k = 0,321, p = 0.00, PTH k = 0.332, p = 0.01 is a statistically significant relationship (6 picture) . The formation size had no correlation with Ca (jon.) and P in the blood serum: Ca (ion.) and P are not statistically significant. The tests after the surgery showed significant decrease of Ca, PTH in blood serum, which is statistically significant, p = 0.00 Ca, Ca (ion.) p = 0.014, statistically significant PTH p = 0.00.

Conclusions:

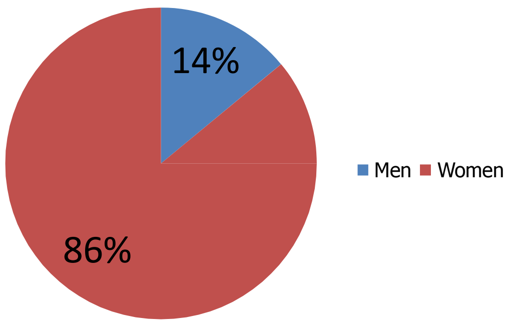
1. 60 per cent of parathyroid adenomas were found by chance, during the US test for thyroid pathologies, and 40 per cent of the examined patients were suspected cases of primary hyperparathyroidism.

2. Parathyroid adenoma size directly correlates with Ca and PTH level n blood serum.

3. Parathyroid adenoma diagnostic method: US visual examination sensitivity is 100 per cent., and radionuclide scintigraphy examination specificity is 82 per cent.

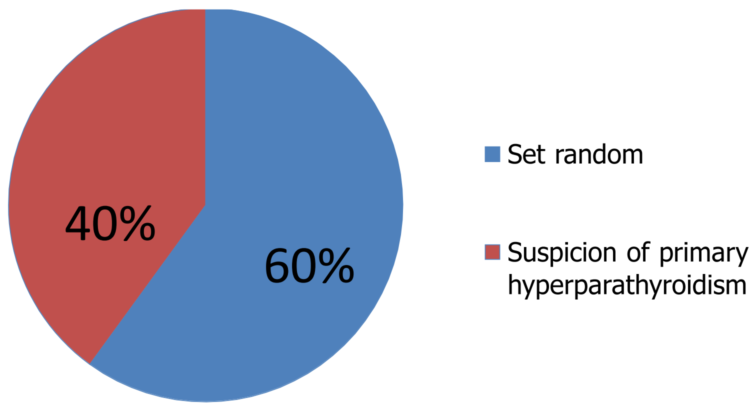
4. Nearly half of parathyroid adenomas' size determined during a US examination coincided with the post-operative findings.

5. The most frequently diagnosed parathyroid adenoma size is of Group II: 1-2cm.

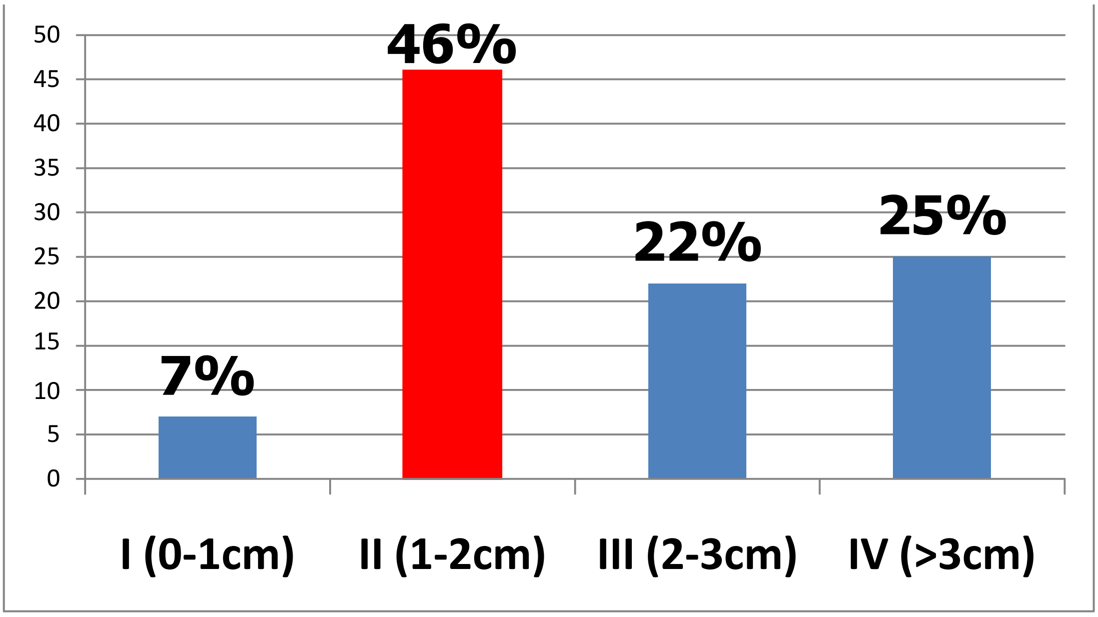


1 picture. It is shown how many of the tested patients were women as men.

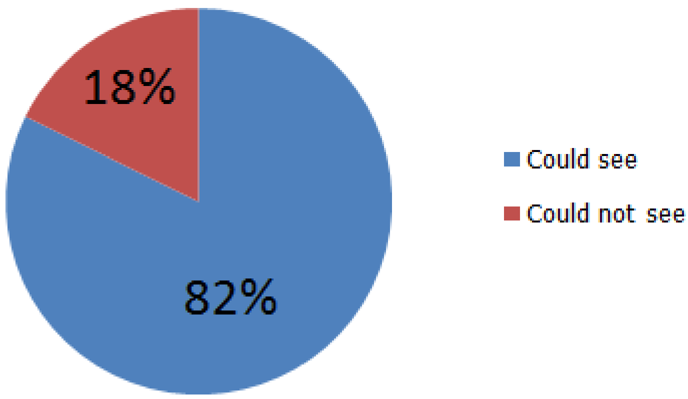
2 picture: It is shown how the average age of men and women, between all patients studied.



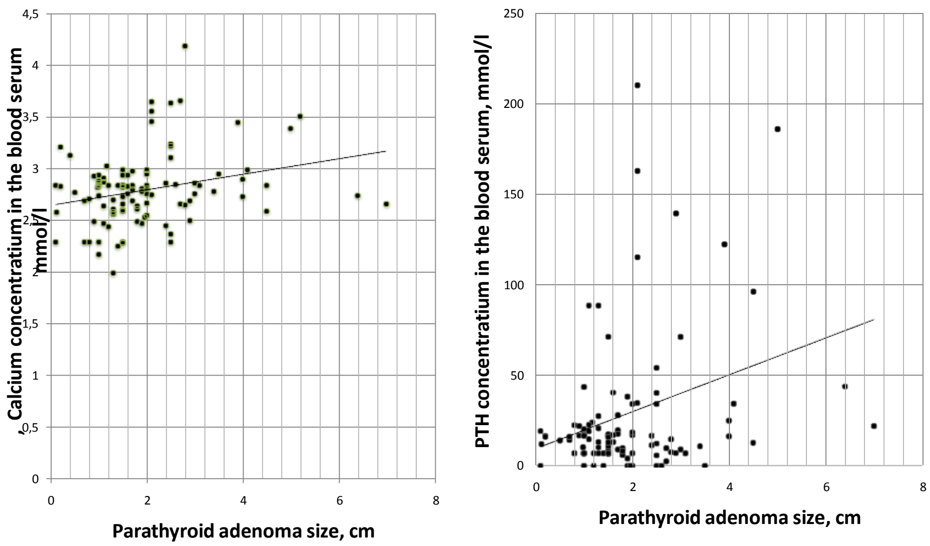
3 picture : Shows the percentage of UG study investigated cases randomly determined and how much suspicion primary hyperparathyroidism.



4 picture: We show how distributed UG Trial derivatives sizes.



5 picture : Shows the percentage of scintigraphic investigation of the method of analysis of parathyroid adenomas was seen and how much was seen.



6 picture :It is shown how the size of derivatives has correlation with Ca, PTH concentration in blood serum. Ca conc. p <0.00; PTH conc. p <0.01.

Discuction:

Primary hyperparathyroidism is a common disease that affects 0.3 % of the population [1]. Females are suffering from this disease more often than males at the ratio - 3 : 1 [2]. This disease occurs due to one or more pathologies of the parathyroid glands : adenoma or hyperplasia , which causes parathormone surplus and an increase in blood calcium level. The most common cause of the diseases is parathyroid gland adenoma. In the majority of patients adenoma of a single parathyroid gland is diagnosed (about 74-90 percent of cases) ,in about 3-5 percent cases multiple parathyroid adenoma is diagnosed [3]. Diagnostic methods: laboratory tests of Ca, PTH, P levels in blood serum, ultrasound (US), radionuclide scintigraphy (RS), US and RS. The diagnostic methods are complementary in the diagnosis of parathyroid adenomas: US test is more sensitive, and scintigraphy complements US test by more precise specificity [4], [5], [6].

This study suggests that the suspected parathyroid adenoma to perform laboratory tests and diagnostic use visual analysis methods: US and RS. These diagnostic methods should be aware of every family doctor, endocrinologist, and other areas of the doctors.

References:

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