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PRIMARY HYPERPARATHYROIDISM: SINGLE CENTER EXPERIENCE

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ABSTRACT

Primary hyperparathyroidism (PHPT) results from inappropriate overproduction of parathyroid hormone from one or more adenoma, hyperplasia or less commonly carcinoma. The incidence of PHPT in USA is 1/700 and male/female ratio is 1/3. PTH is mostly demonstrated as adenoma. 80% of the cases present with solitary adenoma. We conducted this study to investigate the 6 patients that were diagnosed and operated for primary hyperparathyroidism between the years 2007-2013. 6 patients who diagnosed and operated for primary hyperparathyroidism in our clinic between 2007-2013 were analysed retrospectively. All of the 6 patients were female. The age average was 56 (48-66). The average of plasma calcium levels were 12.1 mg/dl (11.5-13.2mg/dl) and plasma parathormone levels were 240 pg/dl (190-550 pg/dl). Preoperative adenoma localisation with neck region USG could only be achieved in 3 patients (50%). However the sensitivity of Tc sesta MIBI scintigraphy was 100%. All of the adenomas were located and extracted and there were no mortality or morbidity among the patients. We think that the macroscopic evaluation of the tumor by an experienced surgeon is more appropriate and the frozen involved pathological examination could be useful for the identification of the sample as a parathyroid gland. We used the USG together with scintigraphy for the preoperative localisation and direct adenoma excision were made successfully with unilateral neck exploration in all patients. As a result of minimal invasive surgery no complications occurred in our patients.

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INTRODUCTION

Primary hyperparathyroidism (PHPT) is a disease that results from inappropriate overproduction of parathyroid hormone from one or many parathyroid glands and its etiology is unknown (Clark 1995). Although some factors such as, neck irradiation, mitogenic factors that participate in circulation and "menin gene" in MEN 1 syndrome have been blamed for the etiology of primary hyperparathyroidism, the formation of parathyroid adenomas is unknown in most of the cases. Genetic evaluations have been demonstrated that PRAD-1 oncogene could be responsible of some parathyroid adenomas (Clark 1995). The incidence of PHPT in USA is 1/700 and male/female ratio is 1/3 (Health 1992). PTH is mostly demonstrated as adenoma, hyperplasia and cancer. 80% of the cases present with solitary adenoma.

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It has been reported that, parathyroid hyperplasias that involve the whole gland were 15%-20% and multiple adenomas that include 2 or more glands were 3%-10%. Multigland diseases have been commonly presented in patients over the age of 60 and patients that have familial hyperparathyroidism, MEN type 1 and MEN type 2A (Correa 2002). The increase in the plasma calcium and parathormone level are useful parameters for the diagnosis. A variety of symptoms seen in advanced stages of the disease. The differential diagnosis is difficult due to the variety of symptoms and similar diseases that presents with the same symptoms. Therefore the diagnosis is usually unnoticed. 1/3 of the symptoms are renal in the western society. The incidence of the patients with bone disease has been decreased and reported as 5%-10% (Potts 1992). The bone disease known as osteitis fibrosa cystica is less than 5% (Tanakol 2002). In our country most of the patients are diagnosed with recurrent nephrolithiasis or bone lesions (Bayraktar 2000). Peptic ulcer, acute pancreatitis,

hypertension, weight loss, fatigue, constipation, anorexia, nausea, vomiting, arrhythmia, bone pain, headache, neurosis, psychosis, polyuria, nocturia and pruritis are the others symptoms that also can be seen. However most of the cases are asymptomatic and mostly diagnosis is made by accidental high plasma calcium and parathormone levels (Fischer 1993). We conducted this study to investigate the 6 patients that were diagnosed and operated for primary hyperparathyroidism between the years 2007-2013.

MATERIALS AND METHODS

6 patients who diagnosed and operated for primary hyperparathyroidism in our clinic between 2007-2013 were analysed retrospectively. Diagnosis was made by high plasma calcium (N: 8.5-10.5 mg/dl) and parathormone (N: 19-77 pg/dl) levels. The localisation of the parathyroid adenoma was identified with neck region Ultrasonography (USG) and Tc 99 sesta MIBI scintigraphy. Direct parathyroid adenoma exploration were successfully made based on the preoperative imaging evaluations. Only one case the adenoma was not localised properly and after the exploration the adenoma was found localised in the inferior right lobe, posterolateral of the oesophagus and excised. In one case the adenoma was invaded into the thyroid gland and adenoma was removed with ipsilateral total thyroidectomy. Postoperative 1. day plasma calcium and parathormone levels were evaluated in each patient. The patients were discharged at postoperative 2. day after the evaluation of the laboratory parameters. The follow on evaluations were made at 7. day, 1. month, 3. month and semiannually.

RESULTS

All of the 6 patient were female. The age average was 56 (48-66). The average of plasma calcium levels were 12.1 mg/dl (11.5-13.2mg/dl) and plasma parathormone levels were 240 pg/dl (190-550 pg/dl). Preoperative adenoma localisation with neck region USG could only achieved in 3 patients (50%). However the sensitivity of Tc sesta MIBI scintigraphy was 100%. All of the adenomas were located and extracted, 3 of the cases adenomas were localised at right lobe inferior, 2 of the cases left lobe inferior and one of the case adenoma was localised at right lobe superior. Unilateral exploration that was localised preoperatively were sufficient enough for all of the patients and none of the patient needs bilateral exploration. Ipsilateral thyroidectomy with adenoma excision was done in one of the cases that was invaded to the thyroid gland and after the pathological examination the diagnosis was reported as parathyroid carcinoma. During the hospitalisation period, there were no mortality or morbidity among the patients. Plasma calcium and parathormone levels were decreased to normal range in all patients at postoperative first day (mean Ca: 8.8 mg/dl and mean PTH: 52 pg/dl). One of our patient with osteitis fibrosa cystica hypocalcemia was observed (7.4 mg/dl). During the follow-up no recurrent cases was detected.

DISCUSSION

Primary hyperparathyroidism (PHPT) results from inappropriate overproduction of parathyroid hormone from one or more adenoma, hyperplasia or less commonly carcinoma (Clark 1989). The female/male incidence of 3/1 was similar with the previous studies (Heath 1992). Previously

diagnosis was based on renal and bone originated symptoms. However nowadays plasma calcium evaluation becomes a routine parameter and the diagnosis of the asymptomatic patients are easier (Heath 1992). Two of our patient were complained about musculoskeletal symptoms. One of this patients was diagnosed as osteitis fibrosa cystica. Previous studies suggested that these types of diseases should be medicated with long term oral calcium replacement (Aparwal 2002) One patient was diagnosed as nephrolithiasis. One of them was suffered from recurrent pancreatitis attacks. scheduled for cholecystectomy. Two patients were asymptomatic. The patients with urinary and musculoskeletal symptoms were dramatically improved. The patient with pancreatitis was relieved from the attacks during one year follow up. Osteitis fibrosa cystica patient was started oral calcium medication and recommended orthopedic evaluation. The elevation of PTH level is not sufficient enough for the diagnosis however it becomes a significant parameter together with hypercalcemia (Bilezikian 2005). The 50% decrease in parathormone level after the surgery is one of the evidences of successful surgery (Elanj 2002). In 90% of the cases plasma calcium levels are decreased to the normal range about 24-36 hours after the surgery (Bilezikian 2004). Plasma PTH and calcium levels were detected at normal range at postoperative first day, only one patient plasma calcium level was decreased.

The type of procedure during the surgery has been changed over the years. The neck exploration has been admitted as a golden standard and remains as a valid procedure (Clark 1989). Nevertheless, recently some procedures such as minimal invasive procedures, single gland oriented surgery under local anesthesia, radioiodine treatment and localisation with gamma probe during surgery are minimising the complications and shorten the hospitalisation period (Norman 1997, Miccoli 1998, Feng 1996). The bilateral neck exploration increases the risk of recurrent nerve damage and hypoparathyroidism (Bayer 2007). Therefore unilateral approach and the exploration of the localised lesion has recently been accepted. This approach has enhanced the importance of localisation technique. These localisation techniques are USG, Tc 99 sesta MIBI scintigraphy, CT and MRI. Ultrasound is the first choice for the identification of parathyroid adenoma and it has a sensitivity of 65%-85% (18,19). The sensitivity of Tc 99 sesta MIBI scintigraphy is 90% for single adenoma of parathyroid but its sensitivity decreases for multiadenoma and hyperplasia cases (Arici 2001; Ahuja, 2004). In our study we used elevated plasma calcium and PTH for the diagnosis and the localisation of the adenoma was made with Tc 99 sesta MIBI scintigraphy and USG.

Both of the imaging techniques were successfully localised the adenoma in each patient. Since all of our cases were solitary adenomas, the procedures were made under general anesthesia and single gland oriented. The pathological evaluation of the glands during surgery could be made by macroscopically and by the frozen section examination. However these excisional biopsies from the intact glands could damage the healthy glands and cause permanent hypoparathyroidism. Therefore the macroscopic evaluation of the tumor by an experienced surgeon is more appropriate and the frozen involved pathological examination could be useful for the identification of the sample as a parathyroid gland (Bayer 2007). We used the USG together with scintigraphy for the preoperative

localisation and direct adenoma excision were made successfully with unilateral neck exploration in all patients. As a result of minimal invasive surgery no complications occurred in our patients.

Abstract of this study has submitted "19 th National Surgery Congress 2014" as poster presentation which will take place in Antalya / Turkey

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