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A Case of Parathyroid Adenoma, A Medical Chamelon and Review of Literature

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Abstract:

We report a case of parathyroid adenoma diagnosed in our Endocrinology Department, Super Spciality Hospital, Government Medical College, Ananthapuramu. 46-year-old female presented with Anorexia, Vomiting, Constipation, Insomnia, Dizziness, Headache, Generalized weakness of 7 months' duration. Past history of Hypertension since 1 year on Anti hypertensives beta blockers and Angiotensin Converting Enzyme (ACE) inhibitors. We did routine Hematological and Biochemical parameters which revealed hypercalcemia and hypophosphatemia. We send parathormone (PTH) levels which were grossly elevated suggestive of primary hyperparathyroidism. Ultrasonography neck revealed hypoechoeic lesion in lower pole of left lobe of thyroid. Tc 99 Sesta MIBI scintigraphy revealed parathyroid adenoma in upper pole of left lobe of thyroid. Ultrasonography abdomen and pelvis showed fibroids in the uterus. We referred to surgery department and Left superior parathyroid adenectomy done. Intraoperative findings are 17X10mm size lesion noted in left superior parathyroid gland. Post operative period is uneventful. Histopathological examination (HPE) confirmed the diagnosis of parathyroid adenoma. Patient had regular follow up with Endocrinology department. Patient had persistent hypertension even after surgery. Serum Calcium level were normal even 3 years after surgery during follow up.

Keywords: Parathyroid adenoma, Primary Hyperparathyroidism, PTH, Tc99 Sesta MIBI scintigraphy, Para thyroidectomy.

1. Introduction:

The Bone diease Osteitis fibrosa cystica was first described by Von Reclinhausen in 1891. Etiological link between parathyroid adenoma and primary hyperparathyroidism was first established by Mandle in 1925. Peak incidence of parathyroid adenoma is in sixth decade of life and rarely seen below 15 years of age. Two to Three times more common in women than men.

Primary hyperparathyroidism is the third most common Endocrine disorder after diabetes mellitus and thyroid disorders (1). 80 to 90% of primary hyperparathyroidism cases are due to parathyroid adenomas (2). Approximately 20% of cases are due to diffuse hyperplasia of all four parathyroid glands. Very rarely 1 to 2% of cases are due to carcinoma of parathyroid glands. Most of the clinical features of primary hyperparathyroidism are due to hypercalcemia. Hypercalcemia may manifest as

nephrocalcinosis, pancreatitis, depressive episodes, cognitive dysfunction, gastrointestinal symptoms. Raised PTH levels Inhibits Osteoblasts and stimulates osteoclasts resulting in osteoporosis or osteopenia. Raises PTH levels increases the activity of 1 alpha hydroxylase resulting in increased 1, 25 dihydroxy vitamin D (Calcitriol) formation resulting in increased calcium absorption from the gut. Raised PTH levels also act at the level of kidney and increases renal calcium reabsorption and increases phosphate excretion resulting in Hypercalcemia and hypophosphatemia which are classical biochemical features of primary hyperparathyroidism which leaded to diagnosis in our case. From historical perspective, these clinical manifestations were correctly phrased as psychic moans, abdominal groans, painful bones and renal stones (3). These atypical and pronounced presentation of primary hyperparathyroidism makes delay in the diagnosis as in our case. Finally we report a case of parathyroid adenoma which presented with atypical clinical manifestations and we were able to diagnose with routine biochemical parameters, serum calcium and serum phosphorus

2. Case report:

46 year old female presented to Endocrinology department, Supers Speciality Hospital, Government Medical College, Ananthapuramu with generalized weakness, anorexia, nausea, vomiting, constipation, insomnia, headache, dizziness of 7 months duration. Past history of Hypertension of 1 year duration on Anti hypertensives beta blockers, metoprolol 25 mg once daily and ACE inhibitors, enalapril 5 mg once daily. For her non specific complaints she consulted many physicians and gastroenterologists for the last 7 months and could not be diagnosed. As a symptoms are worsening she came to Endocrinology department. No history of any mass in the neck. We did routine hematological and biochemical parameters. Hemotological parameters were normal (Table 1) and her Biochemical profile (Table 2) revealed hypercalcemia and hypophosphatemia suggestive of primary Hyper parathyroidism. As the biochemical parameters are suggestive of primary hyperparathyroidism we sent for parathormone (PTH) levels (Table 3) which were grossly elevated further confirming our diagnosis of Primary Hyper parathyroidism. Biochemical parameter also revealed elevated renal parameter (Azotemia). Then we did ultrasound neck which revealed well defined hypoechoic round to oval nodular lesion measuring 17X13mm in lower pole of left thyroid gland with increased vascularity. Then we did ultrasound abdomen and pelvis to rule of nephrocalcinosis or renal stones but it showed fibroids in the posterior wall of uterus. We did thyroid profile and it was normal. We did plasma vitamin D levels and they were normal. Next we have gone for Tc 99 Sesta MIBI (Sesta-methoxy isobutyl isonitrile) parathyroid scan which revealed parathyroid adenoma in upper pole of the left thyroid gland (Fig 1). We did skeletal survey as a part of evaluation of primary hyperparathyroidism which showed diffuse Osteoporosis, salt and pepper appearance on skull, subperiosteal resorption, thinning of cortex of long bones. However there is no evidence of brown tumours or bone cysts in the skeletal survey (Fig 2). Then we referred to surgery department for excision of tumour. Patient underwent Superior parathyroid adenectomy under general Anaesthesia. Intraoperative findings are 17X10mm lesion is present in the left superior parathyroid gland. Post operative period was uneventful. We sent Biopsy for Histopathological Examination (HPE) and confirmed the diagnosis of parathyroid adenoma (Table 4). However the hypertension is persisted even after surgery and now the patient is on Angiotensin Receptor Blockers (ARB), telmisartan 40 mg once daily and Calcium Channel Blockers (CCB), amlodipine 5 mg once daily with hypertension under control. Patient developed subclinical hypothyroidism six months after

surgery and she was kept on levothyroxine replacement therapy and she is euthyroid now. The serum calcium levels were normal during follow up even 3 years after surgery.

Table 1: Haematological parameters:

Parameter	**Value**
HB%	10.1 gm/dl
Total WBC Count	5700/mm3
Differential Count	Polymorphs – 64% Lymphocytes – 30% Eosinophils – 4% Monocytes – 2%
Plateletes	1,72,000/mm3
ESR	5 mm/hr
HBSAg	Non-reactive
HCV	Non-reactive
HIV I & II	Non-reactive
VDRL	Non-reactive
P- ANCA	Negative
c-ANCA	Negative

Table 2: Biochemical Parameters:

Parameters	**Value**	**1 week after surgery**	**1 year after surgery**	**3 years after surgery**
Serum Calcium	17.5 mg/dl	8.9 mg/dl	9.2 mg/dl	8.4 mg/dl
Serum Phosphorous	1.2 mg/dl			
Blood Urea	21 mg/dl			
Serum Creatinine	1.68 mg/dl			
Random Blood Sugar	132 mg/dl			
Total Serum Bilirubin	0.6 mg/dl			
Direct Bilirubin	0.1 mg/dl			
SGPT	76 U/L			
SGOT	84 U/L			
Serum Alkaline Phosphatase	483 IU/L			
Serum Total Proteins	5.9 gm/dl			
Serum Albumin	3.4 gm/dl			
Serum Sodium	139 meq/L			

Serum Potassium	3.8 meq/L			
Serum Chlorides	96 meq/L			

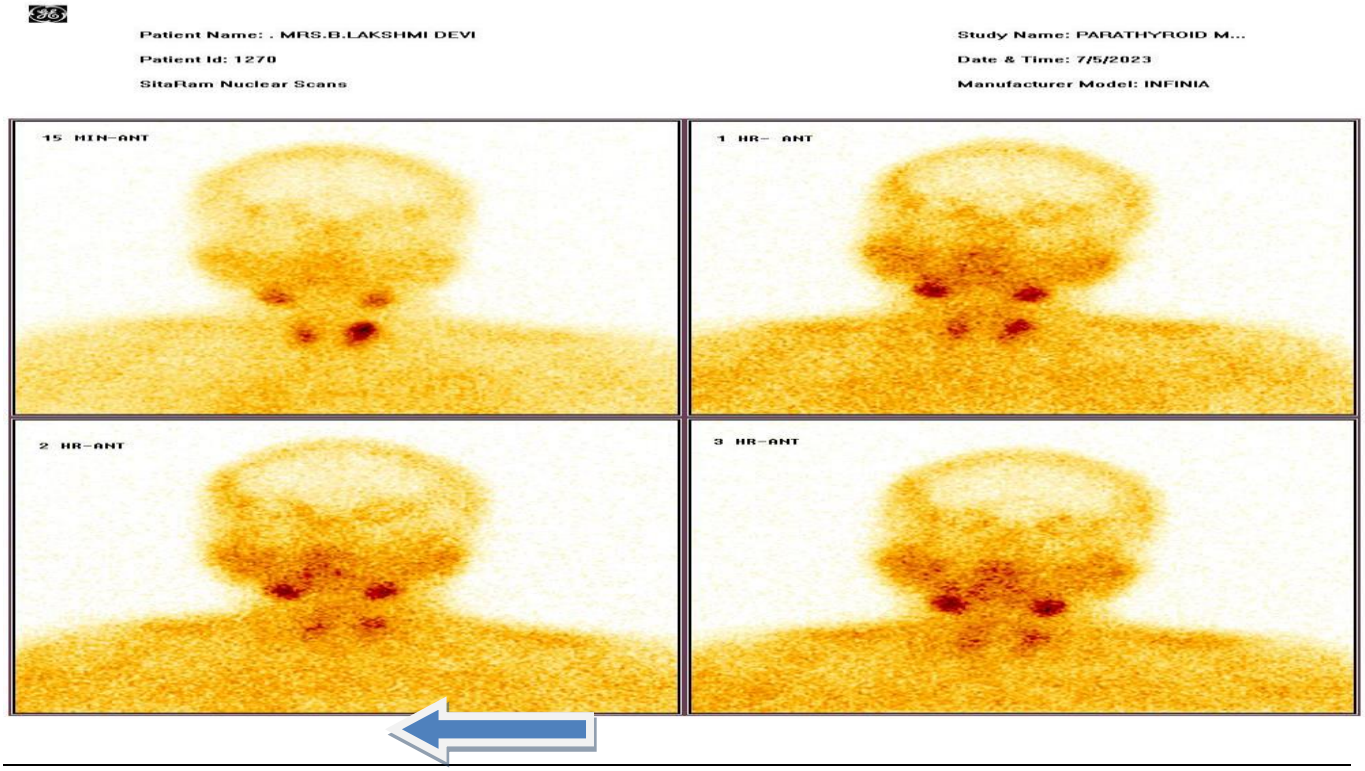
Table 3: Hormonal Parameters

Parameter	**Value**	**6 months after surgery**
Parathormone (PTH)	851 pg/ml	
Vitamin D	37.7 ng/ml	
T3	87 ng/dl	
T4	5.33 micrograms/dl	
TSH	5.11 micro IU/ml	6.11 micro IU/ml

Table 4:

Histopathological Examination	**Impression**
Thin encapsulated lesion shows round to oval cells with scant to clear cytoplastmiccells arranged in sheets, nests and cords and focal areas are admixed with oncocytia type of cells. Interspersed by thin fibrous septae. There is no lymphovascular or perineural invasion. Focal areas shows capsular compression of parathyroid tissue.	Feature suggestive of parathyroid adenoma.

Figure 1: PARA THYROID SCINTIGRAPHY:



PARA THYROID SCINTIGRAPHY:

Clinical Indication	Hyperparathyroidism and hypercalcaemta(S.PTH – 851pg/ml, S.Calcium-17.5mg/dl); to rule out Parathyroid Adenoma.
Tracer used	Tc99m-M1B1
Study Procedure	15 mCi of 99mTc M1B1 was injected was intravenously. Early static images(15 min) and delayed static images(1-3hrs) were acquired.
Scintigraphic findings	Early static scan reveals diffuse tracer activity involving both the lobes of the thyroid gland. A moderate sized focus of intense tracer uptake is noted in relation to upper pole region of left lobe of thyroid gland. Delayed Static Scans shows further physiological wash out of tracer from the thyroid gland. Persistent focal tracer retention noted in relation to upper pole region of left lobe of thyroid gland. Physiological tracer uptake is noted in bilateral salivary glands and myocardium.
IMPRESSION	In given clinical context, present scan findings are suggestive of Parathyroid lesion in relation to upper pole left lobe of thyroid – likely Parathyroid adenoma; kindly correlate.

Figure 2(a): Skull X-ray lateral view showing salt and pepper appearance

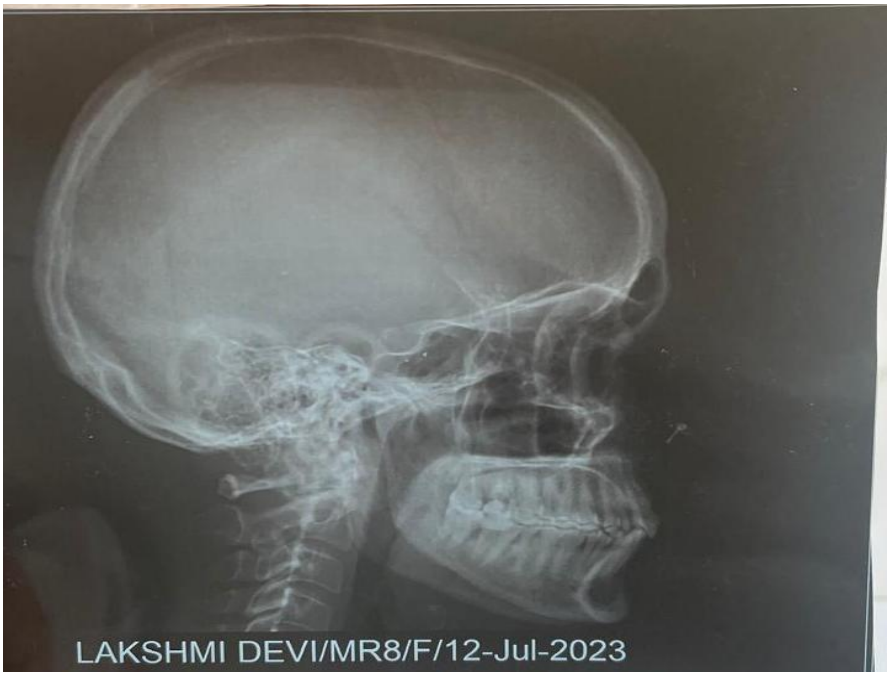


Figure 2(b): X-ray hand showing subperiosteal resorption

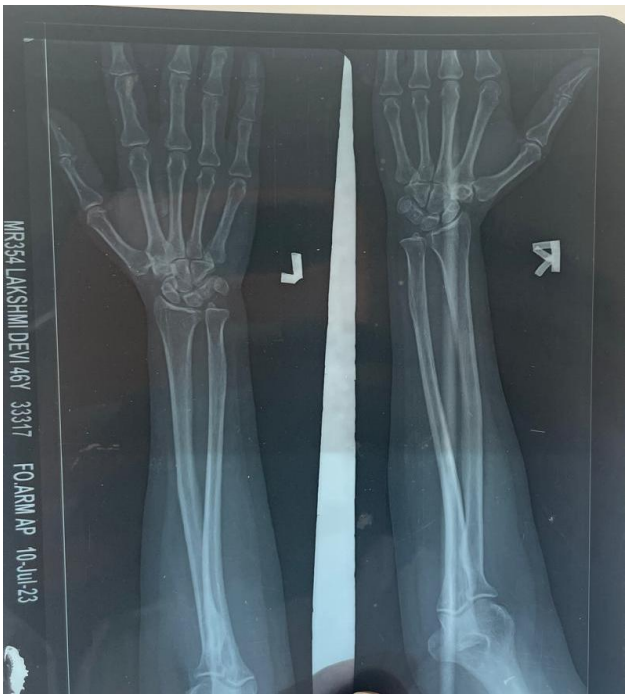


Figure 2(c) : X-ray Chest AP view showing generalized osteoporosis

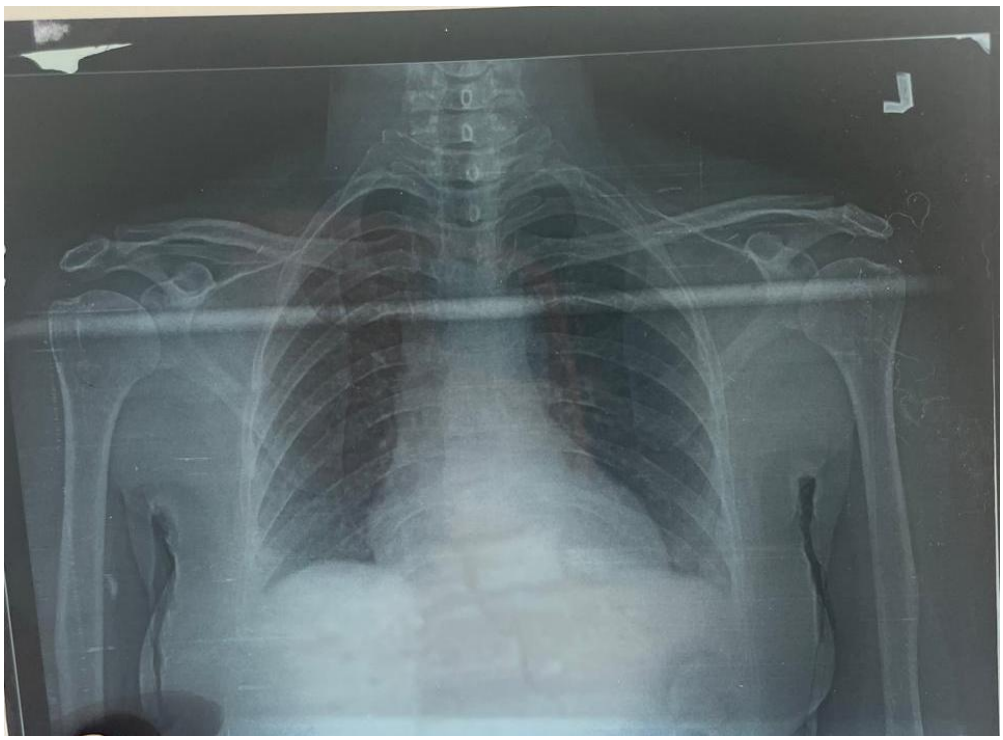
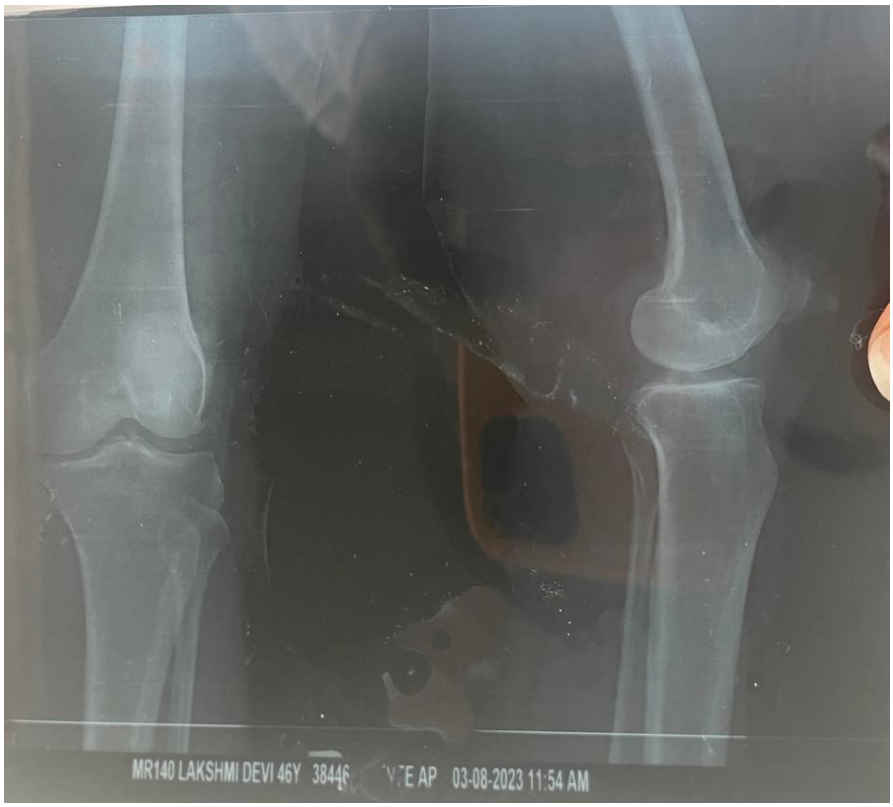


Figure 2(d): X-ray of long bones showing thinning of cortex



3. Discussion:

The present case study illustrates the diagnostic challenge and management of 46 year old female who presented with non specific symptoms and finally diagnosed to have parathyroid adenoma.

Parathyroid tumors account for approximately 0.1 -0.3% of the general population.(1) Primary hyperparathyroidism usually presents as sporadic form accounting for 90% of cases and may be familial in 10% of cases.(2) Primary hyperparathyroidism is the most common cause of hypercalcemia in outpatient department and second most common cause after malignancy related hypercalcemia (4) There are four parathyroid gland located in the posterior aspect of thyroid glands and usually weigh between 40-60 mg each.

Parathyroid adenomas usually discovered on routine evaluation with incidental hypercalcemia in an otherwise asymptomatic patient (5). But in our case the patient had non specific symptoms and the diagnosis was delayed for 7 months until we did TC99 sesta MIBI scintigraphy. Approximately 50% of patients with primary hyperthyroidism may develop hypertension and usually persists even after surgery. In our case the patient had hypertension prior to surgery and continue even after surgery during follow up period of 3 years.

In any suspected case of parathyroid adenoma the initial imaging modality of choice is ultrasonography neck. However ultrasonography neck is observer dependent. In our case the

ultrasonography neck showed lesion in the lower pole of left thyroid gland. However parathyroid scintigraphy with Tc 99 sestaMIBI scintigraphy showed lesion in upper pole of left thyroid gland and it was confirmed during surgery.

According to Madkhali et al (6) elevated serum calcium and PTH are hallmarks of primary hyperparathyroidism. In our case the serum calcium levels were 17.5 mg/dl and PTH levels were 851 pg/ml suggestive of primary hyperparathyroidism. Tc 99 Sesta MIBI scintigarphy is widely utilized imaging modality for localizing the parathyroid adenoma as noted by Spanheimer et al (7). Garas et al (8) emphasizedly role of combined imaging techniques such as ultrasonography neck and Tc 99 Sesta MIBI scintigraphy. However in our case there is disparity in the localization of lesion with ultrasonography neck versus Tc 99 MIBI scintigraphy. In our case Tc 99 Sesta MIBI scintigraphy helped us in localizing the lesion precisely when compared to ultrasonography neck. So we recommend Tc 99 Sesta MIBI scintigraphy for localizing the lesion in patients with parathyroid adenoma.

The risk of post operative hypocalcemia, common complication following parathyroidectomy is often correlated with the size of adenoma (9-14). However as Zamboni et al (15) noted small adenomas as in our case, they have lower risk of postoperative hypocalcemia. The patient remained asymptomatic and normocalcemic during 3 years follow up period indicating successful long term out come. This result is consistent with findings of study by Abdel-Aziz et al (16). Power et al (17) describe the unusual presentation of parathyroid adenoma and it was true as in our case the patient presented with non specific symptoms.

The patient post operative course was uneventful with normalization of serum calcium levels. This favourable outcome aligns with the findings by Abdul-AZIZ et al (16) who reported high success rate and excellent post operative outcome. The cure rate with successful surgery is up to 94 to 99%. Meticulous care must be taken during surgery to prevent recurrent laryngeal nerve damage. There is no harm to recurrent laryngeal nerve in our case. Our surgeons are expertise in the removal of parathyroid adenomas without harming the neighbouring structures. This aspect of surgery aligns with the best practices highlighted by Sahsamanis et al (18) who stress the importance of nerve preservation during surgical procedure.

Most patients with primary hyperparathyroidism have a solitary adenomas. All such patients are the candidates for unilateral minimally invasive focused parathyroidectomy after precise localization prior to surgery as we did in our case. This ensures acceptable cure rate, reduced complication rates, shorter operative time, shorter hospital stay, cosmetically good and cost effective (19).

4. Conclusion:

The clinical presentation of parathyroid adenoma are usually challenging to physicians from time to time. So, high index of suspicion is required in patients who are presenting with nonspecific symptoms . In majority of cases the mass is not palpable in the neck making us the diagnosis difficult. If we have high degree of suspicion order essential diagnostic parameters like serum calcium and PTH.if they are suggestive of primary hyperparathyroidism should followed by imaging specific to localize the lesion like Tc 99 MIBI parathyroid scintigraphy. Parathyroidectomy is the treatment of choice.

Finally we conclude that high index of suspicion is required to diagnose a case of parathyroid adenoma particularly when patient present with non specific symptoms.

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