

Case Report - A case of neglected chronic back pain resulting in delayed diagnosis of parathyroid adenoma.

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Abstract:

Primary hyperparathyroidism is an important yet often overlooked cause of the chronic musculoskeletal pain. A delay in diagnosis may result in significant skeletal complications. We report a case of longstanding neglected back pain that ultimately led to the diagnosis of parathyroid adenoma. This case highlights the importance of considering metabolic causes in patients with persistent musculoskeletal symptoms and early evaluation to prevent irreversible complications.

Keywords: Chronic back pain, parathyroid adenoma, primary hyperparathyroidism, delayed diagnosis, osteoporosis

Introduction:

Chronic back pain is a common clinical complaint and is frequently attributed to degenerative spine disease or mechanical causes. However, metabolic bone disorders such as primary hyperparathyroidism may present with nonspecific musculoskeletal symptoms, leading to delay in diagnosis ⁽¹⁾. Parathyroid adenoma is the most common cause of primary hyperparathyroidism and can result in significant bone loss, fractures and disability if untreated ⁽²⁾. Our report describes a case in which prolonged neglect of back pain resulted in delayed identification of an underlying parathyroid adenoma.

Case details:

A 48-year-old Indian woman was referred to us from Neurology clinic. She had complaints of progressive low back pain, neck pain, headache, dizziness for three years. She used symptomatic medications from General Practitioners for years and was later referred to Neurologist due to refractory symptoms.

She is a known Diabetic on oral diabetic medications, with poorly controlled sugars. She has dyslipidemia, on statin, hypothyroid for 10 years on levothyroxine 50 microgram per deciliter. She has iron deficiency anemia on iron pills.

She had bariatric surgery in 2005 for obesity and had undergone hysterectomy in 2019. Over the preceding 6 months she developed generalized fatigue, muscle weakness and reduced height. There was no history of trauma, renal stones or chronic steroid use.

Neurologist evaluated her and noted elevated serum calcium level (11.3 mg/dl). She was referred to Endocrinology clinic for further management

Vitals – BP- 103/68mm of Hg, HR 80/ min, BMI 34.55 KG per meter square

On examination, she had localized spinal tenderness over the thoracolumbar region and kyphotic posture.

Investigations:

In view of the symptoms and raised calcium 11.3 mg/dl (8.5 – 10.5), serum parathyroid hormone was advised. The PTH was found to be elevated at 229 picograms per ml (26.4 – 110), vitamin B12 was 333 pg/ml (187-800), HBA1C 7%. X ray PNS showed frontal sinusitis. In view of hypercalcemia and hyperparathyroidism she was advised neck ultrasound scan, which revealed **a well-defined hypoechoic lesion of 7*3 mm noted posterior to the right lobe of thyroid suggestive of right sided parathyroid adenoma.**

X-ray showed osteopenia of the spine with straightening of the cervical spine, pointed C5, C6 and C7 endplate osteophytes are noted along the vertebral bodies (Figure 1).



Figure 1 - Xray spine showing osteopenia of spine

Ultrasound abdomen shows that she has a mild fatty liver, cholelithiasis and absent uterus. MRI brain was done by neurologist and showed no significant intracranial abnormality.

MIBI scan using (416.3 MBq) EARLY AND DELAYED STATIC & HYBRID SPECT CT MIBI IMAGES OF NECK AND CHEST showed minimal to mildly abnormally increased MIBI tracer uptakes, which is approximately 18.0*5.0 mm in size and seen postero inferior to the right lobe of thyroid gland (It is relatively better appreciated in static images as compared to hybrid SPECT CT images) and no obvious tracer retention on delayed washout images. Rest of thyroid gland shows good but asymmetrical MIBI tracer uptakes on early images and

adequate washout pattern on delayed images. No focal area of any abnormal tracer uptakes seen in mediastinal region.

^{99m}Tc thyroid scan (143.2 MBq) shows patchy and symmetrical tracer uptakes except relatively reduce in lower portion of the right lobe of thyroid gland.

MIBI scan confirms there is metabolically active (minimal to mild in nature) parathyroid adenoma (18.0 * 5 mm) in size approximately seen posterior inferior to the right lobe of the thyroid gland (atypical pattern).

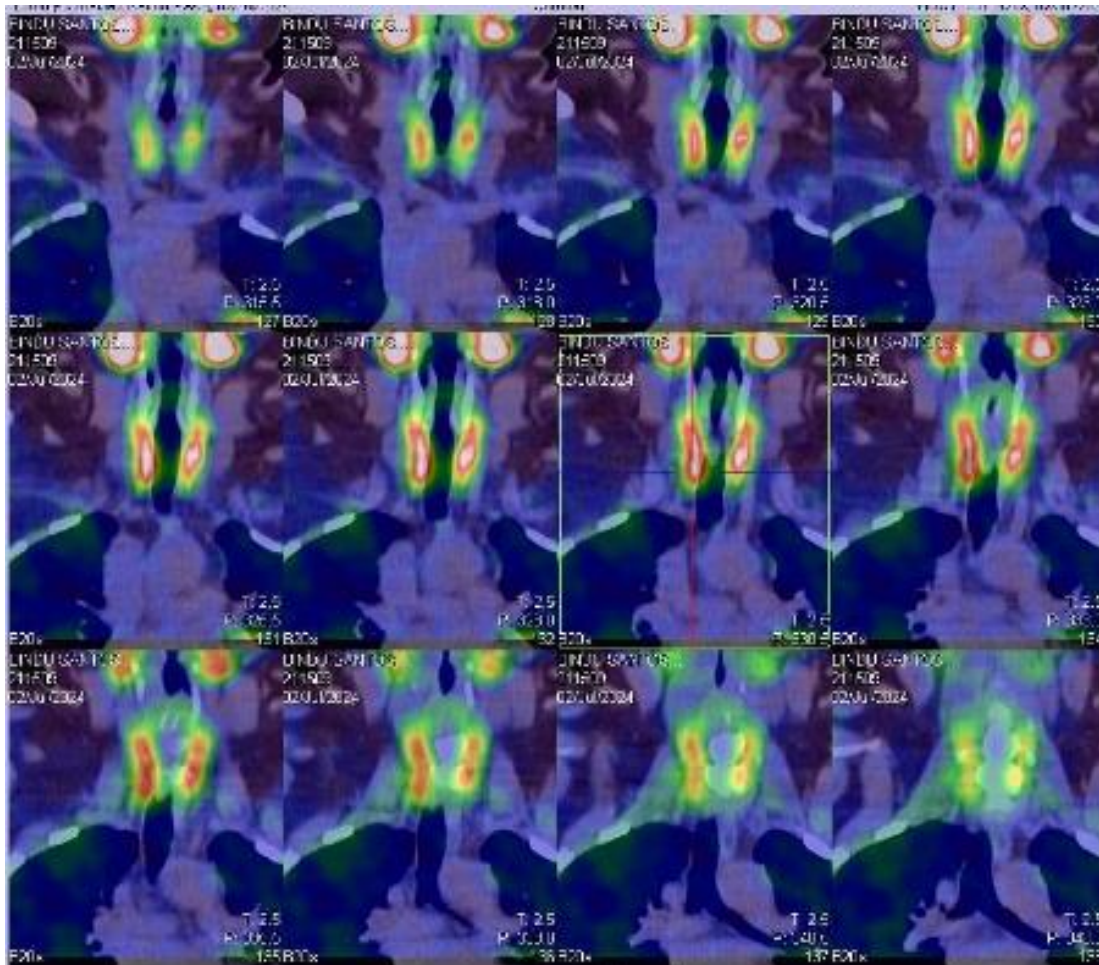


Figure 2 - MIBI SCAN showing adenoma posterior to right lobe of thyroid

Sestamibi parathyroid scan showed the following by images after injecting a radioactive tracer and taking the images overtime to see which glands retain the tracer. The early image shows initial tracer uptake in the neck area. the two hours delayed image shows persistence of the tracer in an abnormal gland while it has washed out from the normal thyroid tissue. This pattern helps identify the location of the issue which can cause symptoms like chronic back pain (Figure 3).

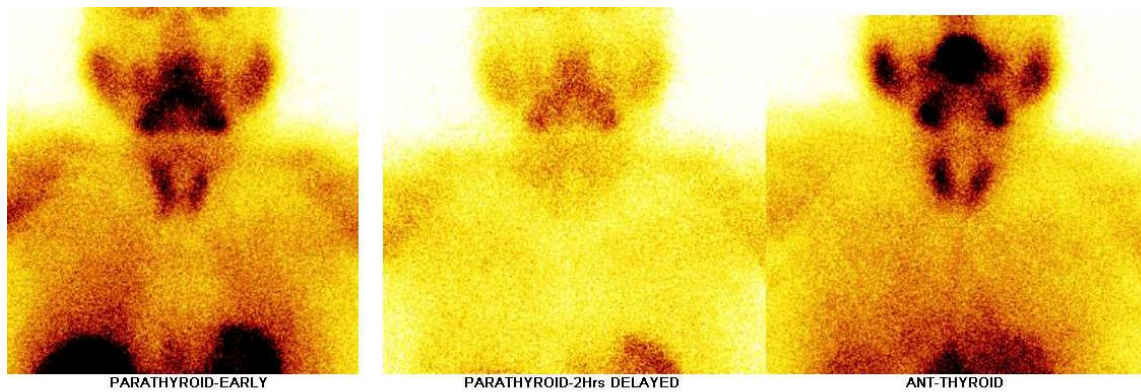


Figure 3 - DIFFERENTIAL TRACER UPTAKE

PET/CT used Radioactive tracer fluorodeoxyglucose showed cells with high metabolic activity absorb more of the tracer and appears as bright hot spots in the images. This image shows the areas of increased tracer uptake distinguishing between healthy tissue and the diseased tissue aiding in the detection staging and monitoring of parathyroid adenoma (**Figure- 4,5,6**).



Figures 4,5,6 SHOWING PET/CT WITH INCREASED TRACER UPTAKE

Management and outcome:

The patient underwent successful parathyroidectomy. Postoperatively serum calcium and parathyroid hormone reached normal levels. She experienced gradual improvement in bone pain and muscle strength. Anti osteoporotic therapy, calcium and vitamin D supplements were initiated. On follow up, her back pain significantly improved.

Discussion:

Parathyroid adenomas are benign tumors of endocrine origin that are associated with primary hyperparathyroidism leading to increased calcium levels due to excessive secretion of parathyroid hormone.

Primary hyperparathyroidism is a medical condition where parathyroid glands produce and secrete excessive amounts of parathyroid hormone causing elevated calcium levels in blood¹. Hyperparathyroidism causes high calcium levels by increasing bone resorption and enhancing the calcium absorption in the intestines through vitamin D activation and reducing the calcium excretion by the kidneys. Additionally, it lowers the phosphate levels preventing calcium from binding and further contributes to hypercalcemia. The most common cause of this over activity is a benign tumor called parathyroid adenoma the patients may have a range of symptoms such as depression, fatigue, kidney stones and bone pain². Blood tests that demonstrate

hypercalcemia and increased PTH levels are commonly used to diagnose condition ³. Imaging techniques such as ultrasonography and nuclear scan used to identify the overactive gland ⁴. The definitive treatment for primary hyperparathyroidism surgical excision of the afflicted gland leading to calcium level stabilization and resolution of symptoms (⁵).

Various imaging modalities have been proposed to enhance the preoperative localization of parathyroid adenoma which is crucial for successful minimal invasive surgical approach as per Muhammad et.al approximately 80 to 90% of PHPT cases involve solitary adenomas and precise localization significantly improves surgical outcomes and minimizes the complications Mohammad et.al. This is particularly relevant given the increasing reliance on less invasive techniques shaped by advancements in imaging technologies(5). The most reliable and practical procedure is technetium 99m scanning which identifies an enlarged parathyroid gland in 65 to 80% of cases and has a high sensitivity of up to 80% in determining the location of a single parathyroid adenoma but of only 20% when used to locate multiple adenomas. Examination by contrast enhanced CT and MRI scans can also be used primarily to determine the location of the parathyroid adenomas outside the parathyroid gland (⁶).

This case study emphasizes the significance of early diagnosis and management of parathyroid adenomas to mitigate complications such as bone disease and hypercalcemia. It highlights nonspecific symptoms such as chronic back pain that can mask serious underlying endocrine disorders. Routine evaluation of serum calcium in patients with persistent musculoskeletal pain could facilitate early diagnosis. Awareness among clinicians is essential to prevent irreversible complications and improve the quality of life.

Conclusion:

Chronic back pain may be a manifestation of masked metabolic bone diseases such as primary hyperparathyroidism. Parathyroid adenoma masquerading as Chronic back pain for several years, leading to delayed diagnosis and progressive skeletal complications. So, evaluation of metabolic bone diseases is crucial if the patients have unexplained bone pains or fractures. Early diagnosis and definitive treatment of parathyroid adenoma can prevent significant morbidity.

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Conflict of interest statement.

None declared.

Consent.

Informed written consent was obtained for the publication of this manuscript and accompanying images.

Data availability statement.

The data is available from the correspondence author and can be reached on request.