A case of Turner syndrome with Graves' disease and primary hyperparathyroidism

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1. Introduction

Turner syndrome (TS) is a relatively common chromosomal disorders by the absence of all or part of a normal second sex chromosome. The association of immune thyroid disorders with TS has been reported. Hashimoto's thyroiditis as a complication is frequent in patient with TS, but an association with Graves' disease has rarely been reported.

Primary hyperparathyroidism (PHPT) is a common endocrine disorder characterized by hypercalcemia and overproduction of parathyroid hormone (PTH) by the parathyroid glands. The most common cause is a single adenoma of the parathyroid gland. An association of PHPT with TS is rare, and association of PHPT with Graves' disease is rare.

2. Case Report

A 12-year 8-month-old girl visited our hospital due to short stature. Her height was 130.7cm (-3.6SD), and her weight was 42.0 kg (-0.24 SD). She had cubitus valgus, a short neck, and breast budding (Tanner stage II) without a webbed neck, congenital heart anomaly, Laboratory results were as follows: Ca 10.3 mg/dL, Mg 1.7mEq/L, LH 11.7 mIU/mL, FSH37.7 mIU/mL, estrogen 18.6 pg/mL, IGF-1 304 ng/mL, and bone age 12 years and 0 months. All other laboratory findings including thyroid hormone were normal. Her peripheral lymphocyte analysis using the G-band technique revealed the following karyotype: 46,X, del(X)(p11.1). She was diagnosed Turner syndrome.

When the patient was 13 years and 4 months old with normal function of thyroid hormone, she was treated with GH for 3 years and 9 months. Her height reached 146.6 cm (-2.2 SD). Menarche began spontaneously at the age of 14 years and 2 months , but her cycle was irregular and gradually disappeared. At the age of 17 years and 1 month, she was given Kauffman therapy. At the same time, she showed goiter. The diagnosis of Graves' disease was established by serum findings as follows: Ca 10.9 mg/dL, P 3.1mg/dL, TSH < 0.005 μIU/mL, $fT_4$3.49 ng/mL, T_3 3.00 ng/mL, and TSAb 624%, and thyroid swelling (Fig 1) and increased accumulation by technetium scintigraphy. Upon treatment with methimazole, her laboratory findings fell within normal limits. At the age of 20 years, her laboratory data were as follows: serum Ca 10.6 mg/dL, P 3.3 mg/dL iPTH 105 pg/mL, and she had no symptoms of hyperparathyroidism (Table 1). We followed her condition closely and noted, and 7 moths latter, in serum Ca, iPTH, 1,25 (OH) Vitamin D to 11.1 mg/dL, 110 pg/mL, and 62.2 pg/mL, respectively, and in urine Ca/Cr clearance ratio to 2.2%. Her lumbar (L2-4) bone mineral density using dual-energy X-ray absorptiometry (DEXA) was 0.912 g/cm^2 with a Z score of -0.9; these values were within normal limits. Swelling of a tumor involving the upper left parathyroid gland was identified by cervical ultrasonography and technetium-99m methoxyisobutyl-isonitrile (MIBI) scintigraphy (Fig 2). The tumor(399mg in weight) in the upper left parathyroid gland was resected and pathological analysis revealed an adenoma. She was diagnosed with PHPT. After parathyroidectomy, her serum Ca and iPTH levels normalized.

PHPT can sometimes present as part of Multiple Endocrine Neoplasia type 1 (MEN1). MEN1 is a rare, autosomal dominant inherited disorder. MEN1 have various combinations of parathyroid, enteropancreatic, anterior pituitary, and other tumors. Our case is not concomitant with MEN1 presentation. Moreover, there was no history of endocrine disorders associated with MEN1 in our patient's family.

3. Conclusion

We reported a 20-year-old TS female with Graves' disease and PHPT. She was treated with GH for TS, and with methimazole for Graves' disease. During treatment with methimazole her PTH and serum calcium increased; a large parathyroid gland was noted on the upper left side and removed; on pathology, an adenoma was diagnosed. After surgery the patient's serum calcium and PTH levels normalized.

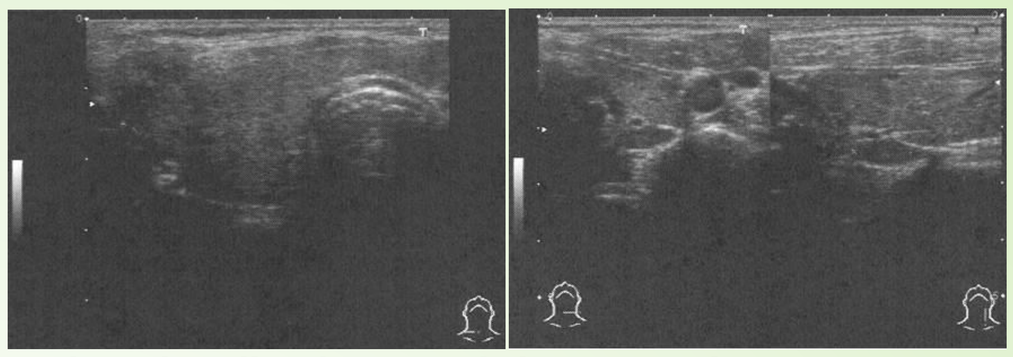
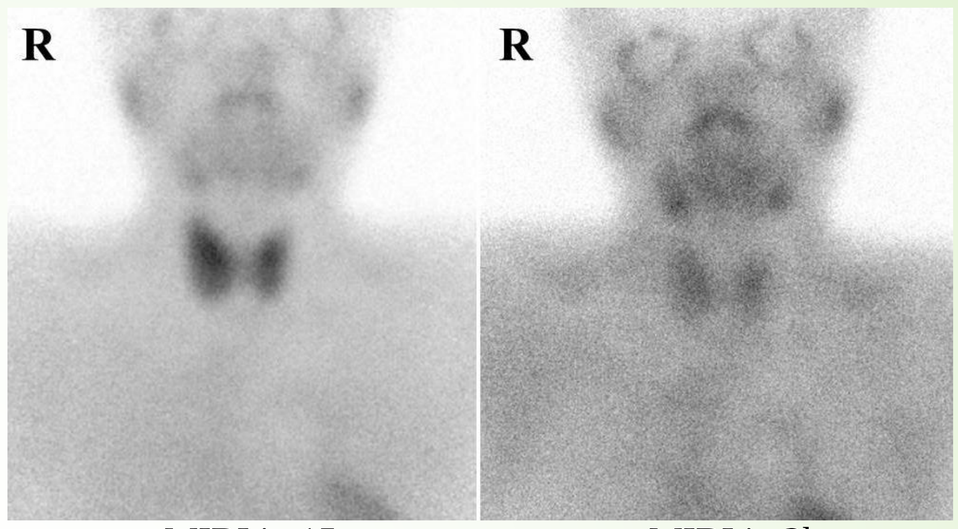


Fig 1. Thyroid swelling by cervical ultrasonography.



MIBI iv 15m MIBI iv 2h

Fig 2. MIBI scintigraphy showed slight accumulation in the upper left parathyroid gland at 2 hours compared to 15 minutes after administration of technetium – 99m MIBI.

Table 1. Laboratory results and treatment.

	13Y4M at GH treatment	17Y1M at diagnosis of Graves' disease	20Y8M at diagnosis of PHP	21Y7M after parathyroidectomy
Ca (8.8–10.6 mg/dl)	10.3	10.9	11.1	9.8
P (2.5–4.3 mg/dl)	4.2	3.1	3.5	3.7
iPTH (16–65 pg/ml)			103	51
TSH (0.38–4.3 μIU/ml)	1.2	< 0.005	0.014	0.331
T3 (0.94–1.70 ng/ml)		3.00		
Free T3(2.40–4.00 pg/ml)	4.19		3.79	3.63
Free T4(0.94–1.60 ng/ml)	1.04	3.49	1.44	1.38
LH (0.3–2.5 mIU/ml)	11.7			
FSH (0.8–4.0 mIU/ml)	37.7			
Estrogen (5–120 pg/ml)	18.6			
IGF-1 (188–654 ng/ml)	304	498		

treatment
GH
Methimazole
Kauffman treatment

Values in brackets indicate the normal range. Y, year; M, month; GH, growth hormone; PHP, primary hypoparathyroidism, iPTH, intact parathyroid hormone; TSH, thyroid stimulating hormone; T3, triiodothyronine; T4, thyroxine; LH, lutenizing hormone; FSH, follicle-stimulating hormone; IGF, insulin-like growth factor.

Reference

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