Novel thyroid hormone receptor β-gene mutations in resistance to thyroid hormone

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Background

The syndrome of resistance to thyroid hormone (RTH) is caused by decreased tissue responsiveness to thyroid hormone. With the exception, inheritance of RTH is autosomal dominant. The receptors are encoded by two genes (*THRA* and *THRB*), each of which undergoes alternate splicing to generate receptor subtypes (TRα1, TRβ1, and TRβ2), with differing tissue distributions.

Case

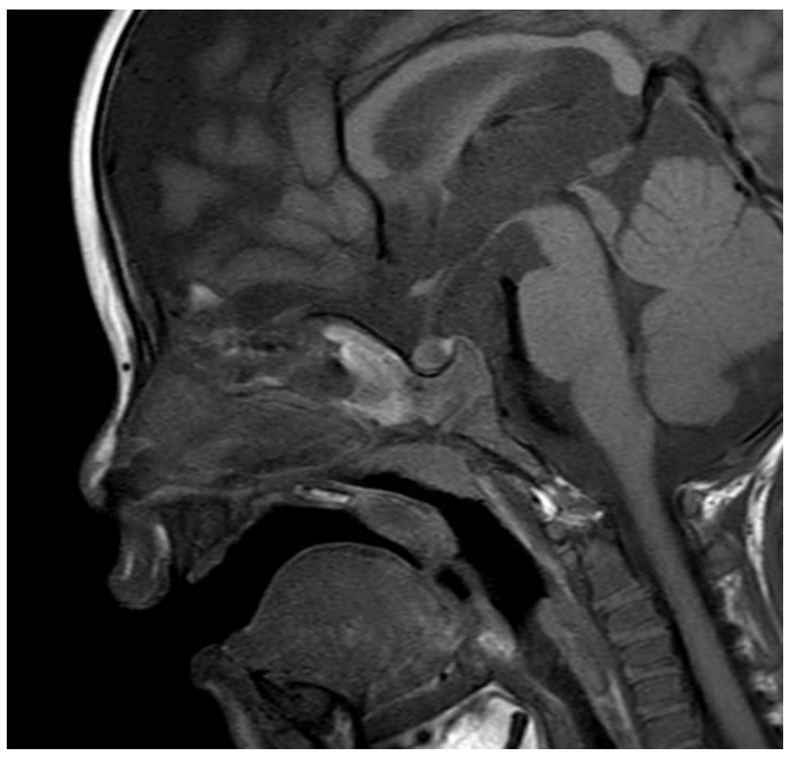
Thirteen-months-old boy presented with hyperthryoxinemia with inappropriately increased TSH levels. He had been treated with l-thyroxine under the diagnosis of congenital hypothyroidism before visiting our clinics. Goiter, growth retardation, delayed bone age, and tachycardia were absent. Further studies are required to obtain long-term data on RTH.

Laboratory findings

Age	TSH (mIU/mL)	Free T4 (ng/dL)	T3 (ng/mL)
6 days	16.67	2.47	1.14
42 days	22.3	1.8	1.13
93 days	4.76	2.33	2
5 months	3.34	3.38	2.53
11 months	3.9	3.22	2.17
13 months	5.33	2.89	1.9

Lab at admission	
Thyroglobulin antibody	11.15 (< 70 IU/mL)
Thyroid peroxidase antibody	12.83 (< 12 IU/mL)
TSH receptob antibody	0.24 (< 1.5 IU/L)
Free alpha subunit	0.3 (0-0.7 IU/L)
Sex hormone binding globulin	123.8 (41.5-150 nmol/L)
Choleseterol	137 mg/dL

Sella MRI : Rathke's cleft cyst



TRH stimulation test

	Basal	30 min	60 min	90 min	120min
TSH	7.02	88.55	73.4	79.29	64.41

Gene test

Gene	Exon	DNA change	AA change	Zygosity	Classification
THRB	9	c.993T>G	p.Asn331Lys	Het	Likely pathogenic