

# Case Report: Resistance of ThyroidHormone due to a novel Thyroid Hormone Receptor $\beta$ -Gene Mutation



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## Background

ThyroidHormone Resistance (THR) is an autosomal dominant,rare syndrome and result of the reduction sensitivity of target tissues to thyroid hormone. There is usually normal or slightly elevated TSH concentration with increase in serum FT3 and FT4 concentrations. The most common cause of resistance to thyroid hormone (RTH) is heterozygous thyroid hormone  $\beta$  (THR  $\beta$ ) gene mutations. THR is defined by Refetoff et al. at 1967. THR mutations have been identified in more than 1,000 individuals in 362 families.

In the present report, we describe the clinical, laboratory finding and genetic analysis of patients with a novel THR  $\beta$  gene mutation.

## Case presentation

Index case 11years 6 month-old girl was admitted to our hospital because of sweating and palpitation. Her physical examination had revealed tachycardia and goiter. The elevated serum levels of FT4 and FT3 coexisted with unsupressed TSH. The index cases' father, two uncles, grandmother and four cousin had findings consistent with the Thyroid Hormone Resistance. Her father, two uncles and grandmother had a history of total thyroidectomy cause of goiter. In scanning the whole family, four adults and five children were identified a novel heterozygot missense mutation, A234D (c.701c>A) located in exon 8 of THR  $\beta$  gene.

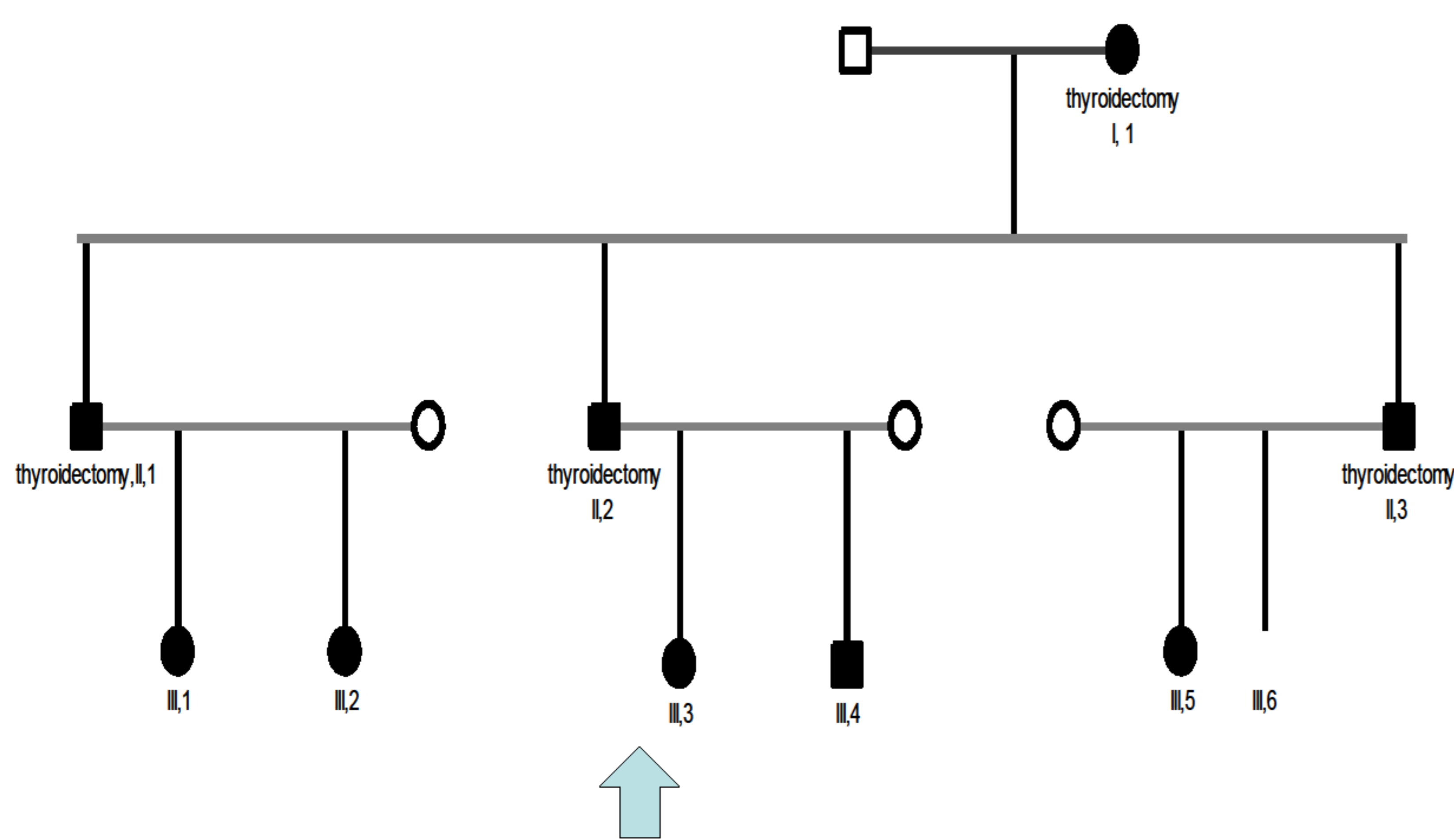


Fig. 1. Pedigree of the family

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505 TGCATCTATGTTGGCATGGCAACAGATTGGTGTGGATGACAGCAAGAGGCTGGCCAAAG
169 -C--I--Y--V--G--M--A--T--D--L--V--L--D--D--S--K--R--L--A--K--

961 AGGAAGCTGATAGAGGAGAACCGGGAGAAAAGCGGCGGGAAGAGCTGCAGAACTCCATC
565 AGGAAGCTGATAGAGGAGAACCGGGAGAAAAGCGGCGGGAAGAGCTGCAGAACTCCATC
189 -R--K--L--I--E--E--N--R--E--K--R--R--R--E--E--L--Q--K--S--I--

1021 GGGCACAAAGCCGAGACCCACAGAGGAGGAAATGGGAGCTCTCAAAACTGTCCACGAAGCC
625 GGGCACAAAGCCGAGACCCACAGAGGAGGAAATGGGAGCTCTCAAAACTGTCCACGAAGCC
209 -G--H--K--P--E--P--T--D--E--E--W--E--L--I--K--I--V--T--E--A--

1081 CATGTGGACCAACGCCAAGGGCAGCCACTGGAAGCAAAAGGAAATTCCTGCAGAA
685 CATGTGGCAGCAACGCCAAGGGCAGCCACTGGAAGCAAAAGGAAATTCCTGCAGAA
229 -H--V--A--T--N--A--Q--G--S--H--W--K--Q--K--R--K--F--L--P--E--

1141 GACATGTGACCAAGCACAATAGTCAATGCCCCAGAAGGTGGAAGGTTGACTTGGAAAGCC
745 GACATGTGACCAAGCACAATAGTCAATGCCCCAGAAGGTGGAAGGTTGACTTGGAAAGCC
249 -D--I--G--Q--A--P--I--V--N--A--P--E--G--G--K--V--D--L--E--A--

1201 TTCAGCCATTTTACAAAATCATCACCCAGCAATACCAAGATGGTGGATTTTGCCAAA
805 TTCAGCCATTTTACAAAATCATCACCCAGCAATACCAAGATGGTGGATTTTGCCAAA
269 -F--S--H--F--T--K--I--I--T--P--A--I--T--R--V--V--D--F--A--K--
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Fig.2. THRB-A234D Missens Mutasyon

## Conclusion

Our study revealed that THR  $\beta$  gene mutations can be seen indifferent clinical manifestations. Many cases do not need treatment. The TR $\beta$  gene mutation confirms the diagnosis and prevent unnecessary and improper treatment.

Keywords: THR  $\beta$ , Thyroid Hormone Resistance