The first case of papillary thyroid carcinoma in an adolescent with congenital dyshormonogenetic hypothyroidism in Serbia

Prvi slučaj papilarnog karcinoma štitaste žlezde kod devojčice sa kongenitalnim hipotiroidizmom u Srbiji

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Abstract

Introduction. Differentiated thyroid carcinoma (DTC) is a rare childhood malignancy, as it represents 0.3–0.4% of pediatric malignancies. Papillary carcinoma is the most common type of pediatric DTC and it represents about 90% of all DTC patients. Although rare, DTC arising from dyshormonogenetic goiter is the most serious complication of congenital hypothyroidism. Case report. We presented the development of thyroid papillary carcinoma in a 15-year-old girl diagnosed with congenital dyshormonogenetic hypothyroidism at neonatal age. Considering the early initiation and proper dosage of hormonal substitution, normal levels of thyreotropin and thyroid hormones were achieved quickly and maintained through a follow-up period. The girl remained euthyroid and asymptomatic until 13.8 years of age, when she presented with a large multinodular goiter. The patient underwent total thyroidectomy. Pathological examination revealed intrathyroid microcarcinoma in the right lobe.

Conclusion. Although differentiated thyroid carcinoma is a rare pediatric malignancy, it is of great importance to have a certain degree of clinical caution and provide a multidisciplinary approach during the follow-up of patients with dyshormonogenetic hypothyroidism.

Key words: congenital hypothyroidism; thyroid neoplasms; carcinoma, papillary; thyroidectomy; child; treatment outcome; serbia.

Introduction

Differentiated carcinoma of the thyroid (DTC) is a rare childhood malignancy, as it represents 0.4–3% of all pediatric malignancies. More than 70% of these appear in patients aged between 11 and 17 and are usually related to radiation exposure. Papillary carcinoma is the most common type of pediatric DTC as it represents about 90% of all DTC cases 1–6. Compared to adults, children tend to have more aggressive clinical course of this malignant disease, with up to 80% cases presenting with regional lymph node metastasis, and pulmonary metastasis in 10–20% 1,2,4,7,8. Although rare, DTC arising from dyshormonogenetic goiter is the most serious complication of congenital hypothyroidism.

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In this case report, we present the development of thyroid papillary carcinoma in a 15-year-old girl diagnosed with congenital dyshormonogenetic hypothyroidism at neonatal age.

Case report

This 15.2-year-old girl was diagnosed with congenital hypothyroidism as a newborn. The diagnosis of hypothyroidism was made by neonatal screening and the child underwent further examination which confirmed the diagnosis of primary dyshormonogenetic hypothyroidism. The patient started substitutional levothyroxine therapy, that she continued to take regularly. Considering the early initiation and proper dosage of hormonal substitution, normal levels of thyreotropin (TSH) and thyroid hormones were achieved quickly and were present all through the follow-up. Regular physical examinations showed no signs of goitre, and the girl was euthyroid and without any symptoms until 13.8 years of age.

At that time, the girl experienced loss of brother who was killed in a traffic accident. Almost immediately after the tragedy, her mother noticed the development of a large goitre and the girl came for an unscheduled appointment. Physical examination discovered a large multinodular goitre. Laboratory tests showed the following results: TSH 0.015 µIU/mL (normal range 0.27 to 4.2 µIU/mL), fT4 12.34 pmol/L (12.0 to 22.0 pmol/L), TPO antibodies over 600 IU/mL (normal range less than 34 IU/mL), Tg antibodies 140.4 IU/mL (normal range 0.27 to 4.2 IU/mL). Ultrasonography revealed a diffuse enlargement of the thyroid as well as the compression of the tracheal cartilage rings and hypoechodensity. Both of the lobi and the isthmus contained confluent nodular masses of 15–20 mm in diameter. These laboratory and ultrasonographic findings were consistent with autoimmune thyroiditis. There was no enlargement of the regional lymph nodes.

At the age of 10, the girl was also diagnosed with hypercholesterolemia, and the family history showed that the girl’s mother and mother’s father also suffered from this disorder. Also, the girl’s grandfather had hyperthyroidism, and underwent thyroidectomy at the age of 63.

The patient was referred to the surgeon, who recommended surgical treatment (thyroidectomy), with a complete preoperative work-up. Chest X-ray and abdominal ultrasound were normal. Laboratory tests, including parathyroid hormone and calcium levels were within allowed range. The patient was referred to total thyroidectomy with ex tempore biopsy.

Pathological examination revealed the presence of intrathyroid papillary microcarcinoma 2.5 mm in diameter in the right lobe. The girl had two attacks of hypocalcemic tetany, so she was advised to take calcium and vitamin D, as well as substitutional levothyroxine therapy.

Currently, the girl is doing well and is euthyroid.

Discussion

The development of differentiated thyroid carcinoma in patients with dyshormonogenetic goiter is very unexpected, especially when it comes to pediatric patients. The case we presented was the first one in western Serbia in the last 30 years, since the application of the neonatal screening program.

Most studies report a male predominance in children under the age of 10, that shifts to a female predominance in adolescents. Another important element in the development of thyroid carcinoma is genetic factor. It has also been suggested that prolonged TSH stimulation, as well as inadequate substitutional therapy and intermittent TSH elevation can be associated with the development of DTC.

Our patient's gender and age were consistent with the previous reports on DTC in children. On the other hand, in the presented patient there was no radiation exposure, pre- or postnatal, accidental or medical. Also, there were no data on thyroid carcinoma in the patient’s family history, although her grandfather had suffered from hyperthyroidism and underwent total thyroidectomy. Levothyroxine treatment was initiated in neonatal age, the doses were adequate all the time and the consequent TSH levels were within normal range during the follow-up, so thyreotropin stimulation as a risk factor can be excluded.

In pediatric population, DTC has a great 20-year survival rate, that has been reported to vary between 90 and 95%. On the other hand, it is considered to be more aggressive cancer in children, compared to adults.

Conclusion

Differentiated thyroid carcinoma is a rare pediatric malignant tumor and the presented patient is the only reported case in Serbia. Although it has a more aggressive clinical course in children than in adults, the 20-year survival rate is excellent. Some risk factors are recognised, and should be kept in mind when assessing patients with congenital hypothyroidism. On the other hand, the presented patient did not have any of these risks in her history, so this case can serve as a reminder that it is of great importance to have a multidisciplinary approach and a certain degree of clinical suspicion even in cases with no apparent risks in patients medical history.
REFERENCES


Received on May 6, 2013.
Revised on August 19, 2013.
Accepted on November 26, 2013.