EUROPEAN JOURNAL OF BIOMEDICAL AND PHARMACEUTICAL SCIENCES
http://www.ejbps.com

ISSN 2349-8870
Volume: 4
Issue: 04
09-12
Year: 2017

A RARE CASE OF PAPILLARY CARCINOMA AT CHILDREN'S AGE

Renata Markosyan*[1] and Natalya Volevodz[2]

[1]Yerevan State Medical University, Department of Endocrinology, "Muratzan" Yerevan State Medical University Hospital, Yerevan, Armenia.
[2]Department of Endocrinology and Diabetology of Pediatric Faculty, First Moscow State Medical University after I. M. Sechenov, Russian State Scientific Center for Studying Endocrinology, Moscow, Russia.

***Corresponding Author: Renata Markosyan**
Yerevan State Medical University, Department of Endocrinology, "Muratzan" Yerevan State Medical University Hospital, Yerevan, Armenia.

Article Received on 22/01/2017 **Article Revised on 12/02/2017** **Article Accepted on 05/03/2017**

Differentiated thyroid carcinoma (papillary and follicular thyroid carcinoma) is rare during childhood and adolescence.[1] Besides being a rare disease, the differentiated thyroid carcinoma accounts for about 0.5–3% of all malignancies in the pediatric population.[2] It makes 90–95% of all pediatric thyroid cancers; medullary thyroid carcinoma is present in 5–8%, and undifferentiated anaplastic carcinoma is extremely rare. The annual occurence of differentiated thyroid carcinoma in children under 16 years of age is between 0.02 and 0.3 cases per 100,000, whereas the annual occurrence per 100,000 in general population ranges from 1.2 to 2.6 in men and from 2.0 to 3.8 in women.[3] The occurrence of thyroid carcinoma in early childhood is very rare. In the literature, there are few cases of differentiated thyroid carcinoma in neonates and infants at the age under 6.

KEYWORDS: Thyroid, carcinoma, follicular, papillar.

Despite the absence of specific signs, clinical thyroid carcinomas in children and adolescents is specified by its aggressive course. The incidence of tumor intrusion into the gland capsule and surrounding anatomical structures reaches 24.1 % - 52.0 %. Many researchers mention a high rate of carcinoma multifocal growth in children and adolescents (up to 65.6%).[4] Regional metastases are revealed in 36.8 % -93.0% of cases by the time of the first surgery.[5] The rate of thyroid cancer remote metastases in children makes 50%.[6] Growth high aggressiveness urges the necessity of thyroid cancer early diagnostics, determines surgical intervention tactics and patient's postoperative management.

However, the peculiarities of thyroid carcinoma clinical course, depending, on various etiological factors in comparison to those in adult patients, still remain unclear. At the same time along with the progress in molecular genetic studies of thyroid gland cancer, standard clinical approaches are being improved and the new ones - developed.

It is obvious, that the problem is topical and it proves the necessity of not only further improvement of the existing diagnostic methods and their efficacy evaluation, but also the search of new noninvasive research methods which are informative enough, developing of optimal diagnostic algorithm to diagnose thyroid carcinoma earlier.

Here we present a rare case of papillary carcinoma in pediatric practice.

Patient P.A., 5 years (born in 2001).
Complaints on admission: general weakness, round-shape formation on the anterior surface of the neck. The mentioned symptoms were noticed during the last two months.

Past medical history: The child was born from the third pregnancy, third delivery at term. Early development was without peculiarities. Parents didn't mention about previous irradiations on the neck. USI revealed that the mother had a node in the left lobe of the TG, 1.2x1.1 cm in size during the last year. A papillary carcinoma without metastases was diagnosed by means of aspiration biopsy of the node.

Objectively
Physical development corresponds to the gender and age. Satisfactory state. Normostenic building. Skin: no eruption, moderately moist. Visual mucosa without eruption, pink, moist. Adipose tissue is normally developed, evenly distributed. In palpation the thyroid gland was enlarged, of dense consistency, uneven surface, painless, clinical picture of euthyroidism. Numerous enlarged dense lymph nodes are palpable on the anterior surface of the neck, on both sides of the thyroid gland. Axillary and inguinal lymph nodes aren't enlarged. Fig.1.

Cardiovascular system: no complaints. The heart area isn't visually changed. The heart tones are rhythmical, clear. The pulse rate is 78 beats per minute. BP–100/60 mm Hg.

Respiratory system: no complaints. Nasal breathing is free. In lung auscultation-weakened vesicular breathing is heard on both sides.

Alimentary system: no complaints. The tongue is pink, moist, fauces – calm, not irritated. The abdomen is painless in all the regions in both deep and superficial palpation. The liver is at the ridge of the costal arch, the liver margin is even, elastic, painless.

Urinary and genital system: urination is free. The tapping symptom is negative. The genitals are formed by the masculine type. Gender status by Tanner scale: 1 (Testis S=D=2 ml in the scrotum). No inflammatory changes.

Adrenal glands: no clinical data concerning dysfunction.

Examination data

Thyroid gland USI data: 3.4x3.6x7.6, volume 11.8 cm^2, isthmus – 1.6 cm. Glandular tissue is not homogenous, hypo- and isoechogenic. The contours are uneven, obscure. The capsule is maintained. A hypoechogenic node is revealed in the right lobe 0.8x0.7 cm, there are 2 hypoechogenic nodes 0.75-0.8 cm and 0.55-0.5 cm in the isthmus, and a hypoechogenic node with expressed vascularization of 1.1x0.8 cm in size in the left lobe.

Neck lymph nodes are enlarged, the sizes are 1.6x0.9 cm, 0.8x0.6 cm, 1.4x0.8.cm from the right, and 1.7x1.2.cm, 1.1x0.9cm,1.05x1.1cm – from the left.

A thin-needle aspiration biopsy of the thyroid gland nodes and the cervical enlarged lymph nodes was carried out. Plasts, polymorphic follicular cells with "powdery" chromatin were found out in the studied material. Atypical follicular cells, calcium crystals with stromal fragments were revealed. Cytological study revealed papillary carcinoma of the thyroid gland with metastatic affection of the cervical lymph nodes (Bethesda 6).

CT data of the head, neck,(Fig.2) thoracic cavity(Fig.3), abdominal cavity and small pelvis with contrast substance Omnipaque 50 ml:

The study didn't reveal metastatic foci in the brain. Metastatic affection of the lungs was revealed, the largest foci in the lower lobe of the right lung, in C7, C8 segments up to 0.8 cm in size.
The lymph nodes of the lower mediastinum are slightly expressed, up to 1.0 cm in size. No pathological changes in the abdominal cavity and small pelvis organs.

Laboratory study data: Hormonal profile–euthyroid state, general and biochemical blood analysis – without peculiarities.

The boy was operated under general anesthesia. Total thyroidectomy, central and bilateral side cervical lymph dissection were carried out. Tumor growth into the left recurrent laryngeal nerve was revealed during the operation. Respiratory failure arose after extubation and tracheostomy was performed. Postoperative period was smooth, tracheostomic tube was removed on the 7-th day after the operation.

Histologic study of the removed preparation: Papillary non-incapsulated carcinoma of both lobes of the thyroid gland, classical type, with the signs of minimal growth into the capsule of the thyroid gland and the venous lumen of the capsule. Metastases in the left parajugular lymph nodes, 10 right parajugular lymph nodes, 5 prethyroid lymph nodes.

Final diagnosis: papillary carcinoma of the thyroid gland, MTS affection of the lungs T2N1bM1.

A course of radioiodine therapy, thyroid stimulating hormone and thyroglobulin level monitoring, thoracic cavity CT monitoring are recommended. The child needs constant replacement therapy with thyroid preparation as well as calcium preparations.

Fig.1. Clinical features of thyroid cancer. Enlarged thyroid gland.
Fig.2. CT-scan of the neck.
Fig.3. CT–scan of the thoracic cavity.

Learning points

1. Differentiated thyroid carcinoma accounts for about 0.5–3% of all malignancies in the pediatric population.
2. Despite the absence of specific signs, clinical thyroid carcinomas in children and adolescents is specified by its aggressive course.
3. Regional metastases are revealed in 36.8 % -93.0% of cases by the time of the first surgery.
4. Patient's early age, aggressive course of the disease, as well as papillary cancer incidence in the family, what indicates the possibility of hereditary genesis, makes the specificity of the presented case.

Multiple questions

1. What was the stage of cancer in this case?
a. T2N1bM1
b. T1N1M1
c. T3N1.bM0

Explanation

1.a. The right answer is T2N1bM1. T2 = Tumor size is 2-4 cm wide.
N1b = Tumor has spread to lymph nodes in the sides of the neck or upper chest.M1 = Distant metastasis involves distant lymph nodes, internal organs.
1.b. T1 = Tumor size is 2 cm wide or smaller. N1 = Tumor has spread to local lymph nodes. M1 = Distant metastasis involves distant lymph nodes, internal organs.

1.c. T3 = Tumor size is greater than 4 cm or has started to grow outside the thyroid.N1b = Tumor has spread to lymph nodes in the sides of the neck or upper chest.M0 = No distant metastasis

2. Choose the right answer?
a. surgery follow after radioactive iodine therapy
b. radioactive iodine therapy follow after surgery
c. it`s no necessity of radioactive iodine therapy

Explanation
2.a. In some cases surgery can follow after radioactive iodine therapy. But in this case not, because the patient had a big thyroid with multiple lesions. And if he was treated with radioactive iodine before surgery the doses of radioactive iodine will be high.

2.b. Radioactive iodine therapy is a treatment some patients with thyroid cancer may receive after thyroidectomy. Radioactive iodine therapy is administered to destroy remaining thyroid cells after surgery. In this case radioactive iodine therapy follows after surgery because the patient had a big thyroid with multiple lesions.

2.c. Radioactive iodine is administered to destroy remaining thyroid cells after surgery. This treatment is considered effective in properly selected patients because the thyroid cells are the main cells in the body that absorb iodine. When the thyroid cells absorb the radioactive iodine, the cells are destroyed.

3. Choose the right answer?
a. After surgery we must wait with levothyroxine replacement.
b. Radioactive iodine therapy follow after 1 year after surgery**.**
c. It is important to measure the level of thyroglobulin after surgery and radioactive iodine treatment.

Explanation
3.a The purpose of withholding thyroid hormone replacement medication is to increase your level of thyroid-stimulating hormone. It may be necessary for you to go without your thyroid hormone replacement medication for weeks. Furthermore, some doctors recommend a low-iodine diet for several weeks prior to radioactive iodine therapy.
3.b. As early as 4 weeks after thyroid surgery, radioactive iodine therapy or radioiodine remnant ablation may be administered.
3.c. The annual blood work may include a test to measure thyroglobulin —a protein thyroid cells produce. After thyroidectomy and radioactive iodine therapy, the body should not be able to produce thyroglobulin. If the protein is found in the blood test, it could mean thyroid cancer has returned.

DISCUSSION

The issues of etiology, pathogenesis, diagnostics, treatment and prognosis of the patients with thyroid cancer have been in the focus of the fundamental and clinical researches for the last two decades.

The character of the tumor clinical "behavior" is due to the variety of the histological types of the thyroid gland cancer. The search of genetic anomalies, causing hereditary predisposition to the thyroid gland cancer development, is clinically demanded direction of fundamental medicine. Studies revealed that hereditary (germinal) mutations in RET prooncogen often play role in the thyroid gland medullar cancer etiology.[7] V600E mutation in BRAF gene prevailed in most cases and prevails in papillary carcinomas, it is also revealed in anaplastic and slightly differentiated carcinomas, originated from papillary carcinoma.

It is obvious, that the problem is of utmost importance. This proves the necessity of not only further improvement of the existing diagnostic methods and their efficacy evaluation, but also the search of new noninvasive research methods, which are informative enough, as well as developing of optimal diagnostic algorithm to diagnose thyroid tumor earlier and rational surgical and curative tactics in patients with such pathology.

Patient's early age, aggressive course of the disease, as well as papillary cancer incidence in the family, what indicates the possibility of hereditary genesis, makes the specificity of the presented case. All this urges the necessity to carry out molecular genetic studies to reveal mutations.

REFERENCES

1. Schlumberger M.Papillary and follicular thyroid carcinoma. Ann Endocrinol, 2007; (Paris) 68: 120-128.
2. Vaisman F, Corbo R, Vaisman M. Thyroid carcinoma in children and adolescentssystematic review of the literature. Journal of Thyroid Research, 2011; 845362. doi:10.4061/2011/845362
3. Krassas GE, Rivkees SA, Kiess W (eds): Diseases of the Thyroid in Childhood and Adolescence. Pediatr Adolesc Med. Basel, Karger, 2007; 11: 210–224.
4. Nobuyuki W., Kiminori S., Takashi M., Mitsuji N., Wataru K., Hiroshi S., Keiko O., Hirotaka N., Shohei H., Yasushi R., Munetaka M., and Koichi I. Pediatric differentiated thyroid carcinoma in stage I: risk factor analysis for disease free survival. BMC Cancer. 2009; 9: 306.Published online, 2009 Sep 1. doi: 10.1186/1471-2407-9-306
5. Kiratli PO1, Volkan-Salanci B, Günay EC, Varan A, Akyüz C, Büyükpamukçu M. Thyroid cancer in pediatric age group: an institutional experience and review of the literature. J Pediatr Hematol Oncol, Mar, 2013; 35(2): 93-7. doi: 10.1097/MPH.0b013e3182755d9e.

6. Mhiri A, Elbez I, Slim I, Ben Slimène MF, Thyroid Disorders Ther, 2015, 4:1. http://dx.doi.org/10.4172/2167-7948.1000171
7. Dotto J, Nosé V. Familial thyroid carcinoma: a diagnostic algorithm. Adv Anat Pathol, Nov, 2008; 15(6): 332-49. doi: 10.1097/PAP.0b013e31818a64af. Review.