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Metastatic Papillary Thyroid Cancer Diagnosed and Treated during Pregnancy

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Case Report

Abstract

Physiological changes of the thyroid gland encountered during pregnancy can cause previously diagnosed thyroid nodules to grow or new nodules to form. Surgery of the slowly growing, localized, non-metastatic, well-differentiated, thyroid cancers diagnosed during pregnancy can be delayed to after delivery, whereas rapidly growing and metastatic cancers with compressive symptoms may be a candidate for surgery during pregnancy. In this case report, we present a case of cervical metastatic papillary thyroid cancer diagnosed and treated by total thyroidectomy and right functional neck dissection during pregnancy in a 22-year-old pregnant woman at 23-week pregnancy. In this case report, the optimal treatment for papillary thyroid cancer diagnosed during pregnancy is discussed under the light of current endocrine guidelines and previous case reports and series.

Keywords: Thyroid cancer, pregnancy, metastasis, thyroidectomy

Introduction

Thyroid cancers include many subtypes according to the cell groups that they originate from. Differentiated thyroid cancers involve papillary thyroid cancer (PTC) originating from follicular epithelial cells, follicular thyroid cancer, and Hurthle cell thyroid cancer. PTC is the most common thyroid cancer and it constitutes approximately 80% of all thyroid cancers (1).

Differentiated thyroid cancer is the second most common malignancy after breast cancer during pregnancy period and its incidence is 3.6-14 per 100000 pregnant women. Chorionic gonadotropin increasing during pregnancy shows molecular similarity to thyroid stimulating hormone (TSH) and it can lead to the progression of benign or malignant thyroid diseases during pregnancy (2). On the other hand, when PTC is found in a pregnant woman, it can be difficult to decide on the method and time of treatment because a balance must be established between the optimum treatment of mother and fetal safety.

In this case report, we present a patient who was treated by total thyroidectomy and right functional neck dissection due to the diagnosis of metastatic papillary thyroid cancer at 23-week pregnancy in the light of current guidelines, publications, and case series.

Case Report

A 22-year-old pregnant woman at the 23rd gestational week was consulted from the clinic of gynecology and obstetrics because of a mass lesion in the anterior part of the neck. The medical history of the patient revealed no additional disease and it was learned that 3-cm mass lesion in the midline of the neck had grown in the last one month. Physical examination revealed diffuse growth in the thyroid and two palpable lymph nodes in the right cervical chain.

Ultrasonography of the thyroid and neck revealed apparent parenchymal heterogeneity also covering the right part of the isthmus, punctual calcifications and solid regions in the right thyroid lobe; heterogeneous nodular lesions with unclear margins near the lower pole; and multiple 10-15 mm-sized lymph nodes extending from the neighborhood of the right lobe of the thyroid to the corner of mandible, including internal necrosis and calcification, with metastatic appearance in the cervical region. The result of fine-needle aspiration biopsy (FNAB) performed under the guidance of ultrasonography was reported to be consistent with pap-

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Figure 1. Total thyroidectomy surgical material

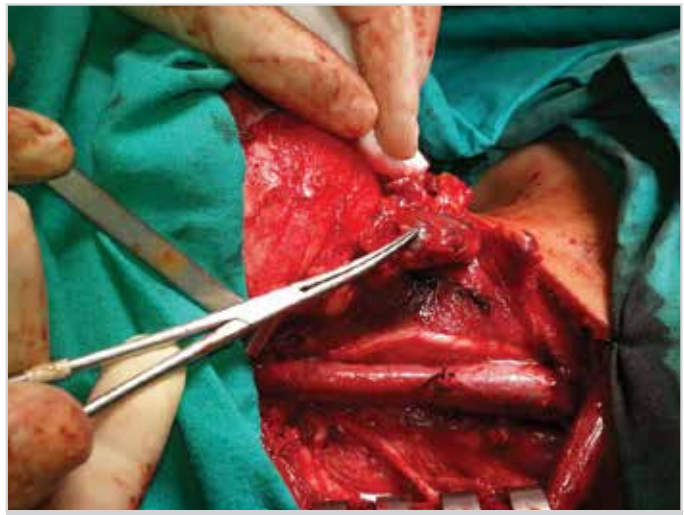

Figure 2. Metastatic lymph nodes in the right side of the neck

illary thyroid carcinoma. The patient had no history of exposure to radiation and no familial history of thyroid cancer. Serum TSH, free triiodothyronine (fT3) and free thyroxine (fT4) levels of the patient were within normal limits. Preoperative consultations were ordered from the departments of Gynecology and Obstetrics and Endocrinology. Ultrasonographic examination of the fetus was healthy. The patient underwent total thyroidectomy and functional neck dissection covering the right central region under general anesthesia (Figure 1 and 2). It was found that patient's postoperative vocal cord movements were natural and calcium levels were within normal limits. The histopathologic examination was reported as papillary thyroid carcinoma in the material of total thyroidectomy (right lobe) and 5 lymph node metastases (two in the VI. region, two in the III. region, and one in the IV. region). Fetus was found to be healthy in the control examinations performed in the postoperative period by the department of Gynecology and Obstetrics. The patient who was given 150 mg/day levothyroxine (Levotiron tablet®; Abdi İbrahim İlaç, İstanbul, Turkey) for TSH suppression in postoperative period was recommended to receive radioactive iodine therapy after pregnancy by Endocrinology. The patient did not have any other problem during controls.

Written informed consent was received from the patient for using her medical data and photos for academic purpose.

Discussion

Thyroid cancers are the most common endocrinological malignancies and their incidence is three times higher among women than among men. Of thyroid malignancies seen in women at reproduction period, 65% are PTC, 30% are follicular, 3% are medullary thyroid cancers. Ten percent of all PTC cases occur at pregnancy or at early period after pregnancy (3, 4).

During pregnancy, some physiological changes are observed in the thyroid gland. Increased glomerular filtration rate elevates iodine clearance during pregnancy. This stimulates the gland for acting more for the production of thyroid hormone in mother. Increased human chorionic gonadotropin (hCG) in pregnancy has apparent morphological similarity to TSH and it helps the thyroid to activate and to function more. Total T3 and T4 levels increase during pregnancy. In addition to increased thyroid volume, the size of thyroid nodules, which have been present previously, can increase and this elevates the incidence of thyroid nodule during pregnancy (5).

The approach to thyroid nodules recognized during pregnancy is similar to that in patients not pregnant, except that scintigraphy causes contraindications during pregnancy. The basic approach algorithm consists of thyroid ultrasonography and biopsy taken from suspicious nodules (6). According to the 2015 clinical guideline of the American Thyroid Association (ATA), the decision of FNAB must be made considering the size and sonographic features of nodule. In the presence of high-risk sonographic findings (irregular margins with solid hypoechoic nodule or solid hypoechoic nodule having cystic components, microcalcifications, rim calcifications with soft tissue component, the presence of at least one of extrathyroidal spread features), FNAB must be performed for nodules larger than 1 cm. Similarly, in moderate-risk nodules (microcalcification, regular-bordered hypoechoic nodules without extrathyroidal spread), FNAB must be performed for every nodule larger than 1 cm. On the other hand, for nodules with low risk (microcalcification, irregular margin, isoechoic or hyperechoic solid nodules not including extrathyroidal spread or partially cystic nodules having eccentric solid regions), FNAB must be applied in nodules larger than 1,5 cm. For the nodules with very low risk (spongioform or partially cystic nodules not including risky sonographic findings), FNAB must be performed for nodules larger than 2 cm. These nodules can be followed up. In pure cystic nodules without solid component, malignancy risk is below 1% and they must be followed up without biopsy (6). In the ultrasonography examination performed in our patient preoperatively, the presence of hypoechogenic heterogeneous regions with irregular borders and punctual calcifications were the findings in favor of malignancy.

The approach to thyroid cancers diagnosed at pregnancy is open to dispute. It can be said that pregnancy generally do not affect the prognosis of PTC; surgery can be postponed to be performed after the pregnancy period in thyroid cancer cases without spread, especially in ones diagnosed in the period after the second half of pregnancy; and complications and hospital costs are higher and duration of hospitalization is longer in surgery performed during pregnancy (4, 6-9). On the other hand, there are some studies reporting that pregnancy accelerates the spread of PTC with hormonal effects and PTC seen during pregnancy has a worse prognosis (2, 10, 11). In our case, rapid growth of the mass in the thyroid during pregnancy and the presence of metastatic lymph nodes that would require neck dissection can suggest that pregnancy can have negative prognostic effect on thyroid cancer.

In the light of current literature, the decision of surgery must be made according to the histological type, growth speed, and spread of tumor in thyroid cancer cases in pregnant women. In cases diagnosed with thyroid cancer during pregnancy, surgical treatment is indicated for the presence of rapid growth in nodule, compression symptoms, extrathyroid spread, diffuse sclerosant, columnar type or follicular variant, suspicious lymph node in the neck or metastasis. In addition to well-differentiated thyroid cancers with aggressive course, medullary, anaplastic, or insular carcinomas are also candidates for surgery during pregnancy (5). The first trimester is the organogenesis period of the fetus and surgery and anesthesia must be avoided during this period as far as possible. There is the risk for triggering an early labor if surgery is performed in the third trimester. Therefore, the most appropriate period for surgery is the second trimester for mother and fetus (12). In our case, the rapid growth of thyroid mass in the last one month and the appearance consistent with lymph node metastasis in the neck helped us to decide on surgery and the patient was operated in the second trimester.

In terms of postoperative complications in PTC seen during pregnancy, there are some points that must be taken into consideration during surgery. Increased volume of the thyroid gland during pregnancy can make dissection and resection more difficult. Therefore, dissection must be performed carefully in order to prevent recurrent laryngeal nerve paralysis. Moreover, damaged parathyroid glands during surgery can cause temporary or permanent hypocalcaemia in mother (5). In our patient, it was observed that postoperative vocal cord movements were natural and calcium levels were normal.

Conclusion

In the cases of papillary thyroid cancer that is seen in pregnancy period, it can be difficult to give optimal treatment to mother because of possible fetal side effects. Appropriate treatment choices must be applied at correct time without causing any harm to the fetus, by a multidisciplinary approach including departments of Head-Neck Surgery, Anesthesiology, Endocrinology, and Gynecology and Obstetrics and after informing the patient about possible complications that can develop.

Informed Consent: Written informed consent was obtained from the patient who was presented in this study.

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