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Case Report

Papillary carcinoma thyroid in pregnancy: a case report

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ABSTRACT

Thyroid cancer is the fastest rising type of cancer seen among women. Being the second most common carcinoma in pregnancy, it is important to evaluate the physiological changes in pregnancy that may contribute towards development of this condition. Although most thyroid cancers recognized during pregnancy require surgical treatment, but when it needs to be operated on, is dependent on multiple factors along with patients' choice. A 23-year-old primigravida with 6 weeks gestation presented with a midline neck swelling for 4 months. Small initially, it gradually started to increase in size. Radiological and fine needle aspiration cytology was suggestive of papillary carcinoma thyroid. Patient was taken up for surgery in second trimester under general anesthesia-total thyroidectomy with modified radical neck dissection. Till date, limited data is available on the effect of pregnancy on evolution of malignancy so as to prevent it at the right time. This report consolidates the etiology, guidelines and management of thyroid cancer in pregnancy.

Keywords: Thyroid cancer, Pregnancy, Papillary carcinoma thyroid

INTRODUCTION

Thyroid cancer in pregnancy is defined as thyroid malignancy seen during period of gestation or within 12 months of childbirth.[1] It is the second most common endocrinal malignancy detected in young females with 10% cases seen in reproductive age groups. Incidence rate is of 0.144 cases per 1,000 births.

Types of thyroid malignancy commonly seen in pregnancy are papillary and follicular, together termed as differentiated thyroid cancer. Because of very low incidence of other types of thyroid cancer (medullary and anaplastic tumors) in pregnancy, their effects are not well studied.[2] Most common presentation is in the form of thyroid nodule, often misdiagnosed as physiological due to enlargement of thyroid gland in pregnancy. The approach to thyroid nodule in pregnancy is same as that done in general population except for radionucleotide scan which is contraindicated in pregnancy. However, management of cancer in pregnancy is a challenge since controlling malignancy, along with maternal and fetal outcomes are also to be taken care of.

CASE REPORT

A 23-year-old married female gravida 1 para 0 with 6 weeks gestation presented to the ENT outpatient department of a tertiary care center with complaint of midline neck swelling for 4 months. It was initially small and gradually started increasing in size. No associated history of pain, difficulty swallowing, voice change, difficulty breathing, no change in weight and appetite. No family history of thyroid disease or malignancy was found. Her general physical examination was normal. Neck examination revealed a swelling approximately 3x3 cm sized, oval shaped present on left side neck and extending till midline and inferiorly till 1 finger above clavicle, firm, mobile, non-tender. Neck ultrasound revealed a thyroid nodule in left thyroid lobe with no abnormal lymph nodes.

Thyroid profile was done and TSH, T3, T4 were within normal limits. Fine needle aspiration cytology showed features suggestive of papillary carcinoma thyroid.

After the diagnosis, her therapeutic choices were discussed in detail in the presence of the obstetrician. As the patient was primigravida, she refused medical termination of pregnancy. She was advised surgery in her second trimester along with thyroid replacement therapy.

She underwent total thyroidectomy (Figure 1 and 3) with modified radical neck dissection (Figure 2) at 17 weeks of pregnancy. Surgery was uneventful with no anesthesia related complications. Fetal heartrate and ultrasound were normal perioperatively and post-surgery. No complications encountered during postoperative period. Sample was sent for histopathology which confirmed papillary carcinoma thyroid and surgical margins were negative. Patient was put on thyroid replacement therapy one month after surgery, and she delivered a healthy baby at 37 weeks by normal vaginal delivery.

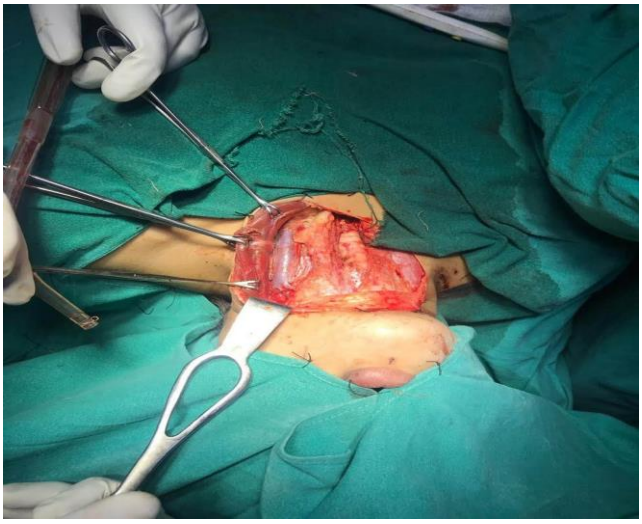

Figure 1: Intraoperative image.

Figure 2: Postoperative image.

Figure 3: Postoperative image.

DISCUSSION

Differentiated thyroid carcinoma is seen in females less than 45years of age with a female to male ratio of 3:1. The incidence of thyroid cancer is seen to be increasing worldwide. Europe and Chernobyl saw a sudden rise in malignancies including thyroid cancer after the nuclear reactor explosion. Iodine deficiency seen commonly in hilly areas contributes to thyroid cancer. Also, familial causes contribute towards medullary carcinoma thyroid. A study of the California cancer registry linked to maternal/neonatal hospital discharge identified a thyroid cancer incidence of 14.4 per 100,000.[3]

With radiological advancements, nodule can be diagnosed at a very early stage but is often confused as physiological enlargement. Upto 10% of thyroid cancers occurring during the reproductive years are diagnosed during pregnancy or in the early post-partum period. Doherty and Rosen have reported rates of up to 43% nodules discovered during pregnancy to be malignant.[4] Therefore, ultrasound along with fine needle aspiration cytology is required to make an accurate diagnosis.

In pregnancy along with physiological enlargement of thyroid gland, hormonal fluctuations are seen. HCG being similar to TSH in structure leads to increase in the activity of the gland, on the other hand estrogen increases the amount of thyroid binding globulin and acts as a potent growth factor for thyroid cells inducing high cell turnover. Therefore, regulation between TSH and estrogens may play a critical role in the development of thyroid disease, thyroid malignancies in particular.[5] Epidemiological studies have investigated roles of hormonal and reproductive factors in development of thyroid cancer. A study conducted by Z. Muhammad et al investigated the role of estrogens in thyroid cancer using a spot urine sample from 40 women with thyroid cancer and 40 age-matched controls. The study concluded that estrogen metabolism is unbalanced in thyroid cancer and suggested that formation of estrogen-DNA adducts might play a role

in the initiation of thyroid cancer.[6] The studies have demonstrated increased prevalence of differentiated thyroid cancer in females than in males, increased incidence in pubertal females and relation between estrogen and its receptors to the regulation of thyroid cancer growth.[7] A cohort study done in teachers in California investigated the role of menstrual and other hormonal factors in development of thyroid cancer. This cohort pointed to an association between age of menarche, menstrual cycle length and risk of papillary cancer.[8] According to a study done by R. Tahboub, a high risk of thyroid cancer was seen in pubertal females and risk declines after menopause supporting the hypothesis that hormonal factors are involved in thyroid carcinogenesis.[9] A large cohort study was conducted to examine an association between maternal and fetal growth factors and risk of thyroid cancer. This study identified high fetal growth during pregnancy a risk factor of thyroid cancer. The plausible pathway suggested is overexpression of insulin growth factor (IGF-1) produced locally by thyroid cells. It acts as procarcinogen and inhibits cellular apoptosis. Fetal growth is positively correlated to umbilical cord levels of IGF-1 and maternal raised levels in midpregnancy.[10]

Definitive management of thyroid cancer remains surgery with thyroid replacement. However, the optimal timing of surgery remains a matter of divided opinion. Some suggest delaying the surgery until the postpartum period, as there is no adequate evidence showing that pregnancy worsens cancer prognosis.[11] The American Thyroid Association recommends surgery after delivery for patients diagnosed with thyroid cancer during pregnancy having no aggressive features and surgery during the second trimester if aggressive features are present. Surgery can be done in second trimester in the following cases: (a) aggressive or locally advanced histology (e.g. anaplastic or poorly differentiated carcinoma), (b) metastatic cervical lymph nodes (diagnosed by cytology), (c) severe compressive symptoms (e.g. tracheal obstruction), and (d) the significant growth of a malignant nodule (>50% in volume or >20% in diameter in two dimensions) before week 24 of pregnancy.[12] The Endocrine society guidelines recommend that if malignant thyroid nodule is discovered in the first or early second trimester, pregnancy should not be interrupted, but surgery should be offered in the second trimester when fetal viability is a valid option.[13] Surgery in first trimester can result in teratogenesis and premature labor in third trimester in third trimester. Outcomes of thyroid surgery in pregnant women are not well characterised and results range from foetal death to no complications.[14]

After thyroidectomy, thyroxine replacement is required as maternal hypothyroidism can lead fetal malformations and low IQ.[15] Thyroxine is administered in a manner which follows the physiological pattern, where there is increased demand at 4 to 6 weeks, increases till 16 to 20 weeks and then remains same till delivery.[13] Another option of treatment that remains is Radioiodine ablation, external beam radiotherapy which is to be given after delivery and cessation of breastfeeding is required. Because I-131 radiotherapy has improved the survival rate of patients with differentiated thyroid cancers that have spread to the neck or other areas, it is now the standard treatment for such cases.

CONCLUSION

Managing thyroid cancer in pregnancy is a challenge and can be safely done by a proper coordination between ENT surgeon, obstetrician and endocrinologist. Effect of pregnancy on evolution of malignancy is not well studied but optimal timing for surgery is after delivery unless indicated. A multidisciplinary team is required for managing and follow up of such cases and details regarding risks involved are to be informed to the patient.

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