

Thyroid cancer in pregnancy: A case report

Mohanad Mohamad Sultan

Department of Surgery, Gulf Medical College Hospital & Research Centre, Ajman, UAE

ABSTRACT

A 21-year old female in her 20th week of pregnancy to the surgical clinic at GMC Hospital with a painless lump in the left thyroid lobe, noticed a few weeks before. A multidisciplinary team of general surgeons, an endocrinologist, a radiologist and a histopathologist was activated for intensive workup and evaluation of the patient. Fine needle aspiration cytology (FNAC) confirmed papillary thyroid cancer. Total thyroidectomy was done at the week 21 of gestation. The postoperative period was uneventful apart from transient postoperative hypocalcaemia. Fetal wellbeing was checked and the patient discharged on the fourth postoperative day.

Key words: papillary thyroid cancer (PTC), multidisciplinary team, total thyroidectomy transient hypocalcaemia, human chorionic gonadotrophins (HCG).

INTRODUCTION

Thyroid cancer is the most common endocrine tumor and the second most frequent tumor among those diagnosed during pregnancy¹. About 10% of thyroid cancers that occur in the reproductive years are diagnosed during pregnancy or within the first year after parturition. The changes in thyroid function as a direct effect of pregnancy are due to the marked increase in the production of thyroid binding globulin by the liver as a result of the elevated estrogen level. Thyroid stimulation during pregnancy is thought to be caused by the high levels of beta human chorionic gonadotrophins (B-HCG)²⁻³.

CASE REPORT

A 21 year old lady in her 5th month of pregnancy was seen at the surgical clinic complaining of a painless mass in the left hemicervical region, noticed during the previous month. The patient was otherwise healthy, with clear past medical history and negative family history.

The examination revealed a noncompressible hard mass in the region of the left thyroid lobe, mobile, not fixed, with no clinically detected cervical lymph nodes, The rest of the physical examination was normal. ENT assessment was done with normal vocal examination and routine workup was initiated.

The neck ultrasound scan showed a

well defined heterogeneous solid mass of 3x3.5x3cm with cystic changes and no calcifications. The rest of the thyroid gland was normal. There was no cervical lymphadenopathy, and full blood count and metabolic panel were normal. The thyroid function test was in its upper normal limitations. Hb was 12.5mg/dl, and S. Calcium 9.2mg/dl.

A multidisciplinary rapid response team was alert for complete evaluation. FNAC revealed the cytological features of papillary thyroid carcinoma. The decision was to go for total thyroidectomy under GA, taking the maternal and fetal risks into consideration. The procedure was discussed with the family and the patient, and consent for surgery was signed.

OPERATION PROCEDURE

Under General Anesthesia, supine position, no neck hyperextension was done. A low collar incision was done approaching the thyroid gland. The left lobe was occupied by a mass of about 3x3.5cm (Figure1). The left lobe was mobilized first by ligation of the left middle thyroid vein. The left upper pedicle then dissected, the external laryngeal nerve identified and secured and the superior pedicle doubly ligated and cut. The inferior thyroid veins were ligated and cut. The upper left lobe was mobilized medially, and the left recurrent laryngeal nerves and the parathyroids

were identified and secured. The right lobe was dealt with in the same manner. The pyramid lobe was dissected and the isthmus separated from trachea. Total thyroidectomy was done preserving both the recurrent laryngeal nerves and the parathyroid glands (Figures 2 and 3). No cervical lymphadenopathy was detected. Two closed suction drains were inserted and haemostasis was secured. The neck was then closed in layers. The patient was kept in the I.C.U for one day and shifted to the surgical ward.

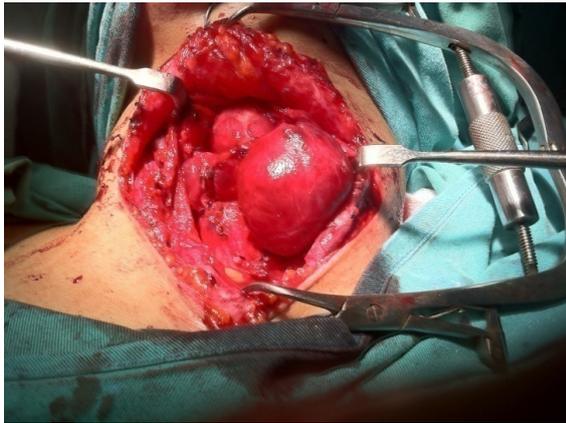


Figure 1. The left lobe of the thyroid gland was occupied by a mass of about 3x3.5cm.



Figure 2. The pyramid lobe was dissected



Figure 3. The resected specimen

On the second post operative day Trousseau sign was positive and serum calcium was 7.4mg/dl. Calcium infusion was started and continued for two days. On the fourth post operative day, serum calcium was 8.3mg/dl. The patient was given oral calcium and vitamin D. Fetal wellbeing was checked and the fetal heart rate was found to be normal.

The patient was discharged on the fourth postoperative day on oral analgesia plus calcium and vitamin D tablets. The patient was reviewed on Day 10 and Day 25, and thyroxin 100mg daily started. The specimen measured 3x3.5cm with margins appearing negative. The histopathological report stated that the specimen was of near total thyroidectomy with well circumscribed papillary neoplasm of focal follicular pattern, with some areas consistent with tall cell variant. The patient has been followed up monthly, and sustained normal vaginal delivery at the 37th week of gestation.

DISCUSSION

Thyroid changes occur during pregnancy due to increased vascularity of the gland and glandular hyperplasia. Although there is an increase in Thyroxin Binding Globulin (TBG), resulting in the increase in total T3 and T4, the free thyroid hormone level remains unchanged. Human chronic gonadotrophin (HCG) hormone level usually increases and its level in pregnant women has been shown to be correlated with the level of thyroid stimulation activity. The thyrotropic role of HCG is also observed in patients with trophoblastic tumors and hyperthyroidism⁴⁻⁶.

Recent studies suggested that pregnancy and lactation may result in transient increase in the risk of papillary thyroid carcinoma, especially in the younger age group. The incidence of thyroid nodule in the female in the reproductive age group is 1-2%, and the estimated prevalence of thyroid cancer is 5-10% in these patients⁷⁻⁸.

The clinical approach to a pregnant female with thyroid nodule is similar to that for the non-pregnant patient except that the radionuclide thyroid imaging is

contraindicated in pregnancy because of the ability of the fetal thyroid to concentrate iodine resulting in cretinism.

Thyroid ultrasound is safe and can differentiate solid from cystic masses, but will not help in diagnosing or excluding malignancy. FNAC is the most important diagnostic tool. It is safe and inexpensive, and its diagnostic accuracy may reach 97%, with false negative results of 1-6%. FNAC can detect the cytological changes of malignancy such as papillary thyroid growth (psammoma bodies which are calcified clumps of cells and orphan annoyed nuclei). FNAC can also be used to study DNA and RNA mutations and to detect ras mutations, PAX8 - PPAR γ (for follicular carcinoma) and methylation of TSH-receptors⁶.

Galactine-3: B-galactosyl-binding protein with cell-cell and cell-matrix interaction is responsible for initiation of growth and malignant transformation. It is positive in thyroid cancer and Hashimoto's thyroiditis. PET/PTC rearrangements can be detected by FNAC.

CD44: Family of membrane glycoproteins is associated with adhesion, lymphocyte activation and tumor growth (PTC).

According to the risk group classification³, AMES prognostic factors (age, metastasis, extrathyroidal extension and size) the patient can be considered in the low risk group with excellent prognosis if she received the proper surgical treatment. The management protocol of thyroid malignancy during pregnancy is still being debated, but the most accepted approach is:

1-In the first trimester the decision depends on the FNAC; if significant cellular changes have occurred, surgery should be done as soon as possible and preferably in the second trimester.

2-In cases where the disease is detected

in the second or third trimester, and the FNAC result is border line, the patient can be safely observed till delivery with suppressive therapy.

There is no evidence that therapeutic abortion will improve the prognosis or the survival rate.

CONCLUSION

The management of malignant thyroid in pregnancy is a major challenge to the surgeon. The condition is not uncommon and this may be due to the hormonal changes that occur during pregnancy. Fortunately well-differentiated thyroid tumors (DTC) represent the majority of the cases. Thyroid nodules in pregnancy should be promptly and intensively investigated.

REFERENCES

1. Bailey and Love's Short Practice of Surgery. Edition by Charles MV.Russell, RCG, Norman WS.22nd Edition. London: Hodder Arnold; chapter 48, 1995:793-800.
2. Townsend CM, Beauchamp RD, B. Evers BM, et al.Sabilton textbook of surgery. The biological basis of Modern Surgical Practice. 18th edition, Philadelphia:Saunders; Chapter 36, 2007:930-952.
3. Shaha AR. TNM classification of thyroid carcinoma. World J Surg 2007;31:879-887.
4. Peter CM. Thyroid Cancer complicating pregnancy. *Obstetrics & Gynecology clinics of North America* 1998 june;25(2):401-405.
5. Rossing MA, Voigt LF. Reproductive factors & risk of papillary thyroid cancer in women. *American Journal of epidemiology* 2000;151(8):765-72.
6. Lee ML, Chem GG, Vlantis AC. Introduction of thyroid papillary carcinoma cell proliferation estrogen is associated with an altered expression of Bcl-XL. *cancer journal* 2005;11(2):113-121.
7. Mack WJ, Preston -Martin S, Bernstein L. Reproductive & hormonal risk factors of thyroid cancer. *Los angeles country female cancer epidemiology, Biomarkers & prevention* 1999;8(11):991-7.
8. Doherty C. Shindo.M. Rice D4, et al. Management of thyroid nodule during pregnancy 2005:251-255.