

Papillary carcinoma of thyroid and pregnancy

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Abstract

Two cases of Papillary carcinoma of thyroid and pregnancy were managed, one with the existing disease diagnosed during pregnancy and the other with a history of near total thyroidectomy. A multidisciplinary approach in the management of both the mothers lead to an uneventful pregnancy, caesarean section with good outcome and were discharged in good health.

Introduction

Thyroid cancer is a less common malignancy comprising less than 1% of all the malignancies. Out of this, papillary carcinoma of thyroid is the most common form of differentiated thyroid cancer that is predominantly seen in the general population and more so in females of reproductive age, 10% of whom were either pregnant or in the early postpartum period when thyroid cancer was diagnosed.¹ As the thyroid gland tends to secrete more thyroid hormone during early pregnancy which may not only lead to abortions and preterm labour but may also be responsible for further growth of thyroid malignancy, as it is speculated that human chorionic gonadotropin plays an important role in the rapid growth of thyroid carcinoma during pregnancy. Thus pregnancy and thyroid cancer still poses controversies and challenges in the management. The concern regarding the therapy for thyroid malignancy during pregnancy, its surgery and further treatment with radioactive iodine ablation and the continuous use of thyroxine thereafter has to be considered wisely. Likewise pregnancy after thyroidectomy and complementary thyroxine seems to be rather safe with better outcome provided there is proper preconceptional counseling regarding pregnancy and recurrence of disease.

Here we present two cases of papillary carcinoma of thyroid of which one presented with recently diagnosed malignancy during pregnancy and the other who had undergone thyroidectomy with supplementary thyroid hormone. Both the patients had an uneventful pregnancy with good outcome and were discharged in good health.

Case series

Case 1.

Twenty six years old primigravida, a medical doctor married for a year was having regular cycle with normal flow, when she was diagnosed to be pregnant by ultrasonography (USG) at 8 weeks period of gestation. At about 20 weeks of gestation, she detected a 3x3 cm nodule in her neck. Being a medical doctor herself, she performed a scan of the neck that revealed a haemorrhagic solid nodule with increased vascularity and was advised for fine needle aspiration cytology (FNAC) that was consistent with papillary

carcinoma of thyroid. Thyroid function test (TFT) done was normal. She had a cardiothoracic vascular surgery (CTVS) consultation at Tribhuvan University Teaching Hospital (TUTH) where she was advised to perform thyroidectomy. She also took a second opinion where she was advised to continue pregnancy and as papillary carcinoma of thyroid was a slow growing tumour she was also suggested to defer resection till puerperium. By then she was already 22 weeks pregnant with a normal anomaly scan. Thereafter she was on regular antenatal checkup with a total of 5 visits along with supplementary iron and calcium and was duly immunized with 2 doses of tetanus toxoid. TFT done during pregnancy

confirmed her euthyroid status. USG at 36 weeks showed a single live fetus of estimated weight of 2675 gms with normal liquor and fundic placenta. Preoperative TFT done was normal (FT3 3.0pg/ml, FT4 1.0 ng/dl and TSH 1.5 μ IU/ml). So with the intention that her next pregnancy might be questionable as she might need to receive radioactive iodine (RAI) ablation, elective CS was performed with the outcome of an alive female weighing 2250 gms with good APGAR score. Post operative period was uneventful and she was discharged on the 3rd post operative day with the suggestion to follow up at the CTVS unit. Two weeks postpartum she underwent total thyroidectomy (Stage 1) and the histopathology report was consistent to papillary carcinoma of thyroid (pTNM- pT2 N0 M0). Five weeks after surgery she had radioactive iodine scan that was normal and TFT that showed a hypothyroid status. She was supplemented with thyroxine 200 μ gm and was advised for yearly follow up with antithyroid and serum thyroglobulin antibody. Till date she is doing fine.

Case 2

Twenty four years old lady came to Gynaecological OPD for preconceptional counseling regarding pregnancy following near total thyroidectomy that was done a year back for the presence of mass in her neck that was gradually growing for past 2 years associated with the neck pain for 3 months. Past history dated back to a year when she was found to have a firm mass measuring 8x8 cm in her neck. USG of the neck revealed 8.3x 3.7x 5.2 cm sized well defined heterogeneous solid mass in the right lobe of thyroid with few cystic areas along with punctuate calcified foci within it. There was no increase in vascularity. The left lobe of thyroid was normal with no evidence of enlarged lymph nodes. So with the impression of large heterogeneous indeterminate mass in the right lobe of the thyroid she was further advised to have a FNAC. FNAC was consistent with papillary thyroid carcinoma and she was planned for thyroidectomy. Near total thyroidectomy was performed. Pre and post operative calcium was normal (2.3 mol/l and 2.4 mol/l respectively) and so was the TFT done preoperatively (FT3 1.8 pg/ml, FT4 9.5 ng/dl and TSH 4.0 μ IU/ml). Post operative period was uneventful. Histopathology report revealed papillary carcinoma of right lobe of thyroid with maximum tumour dimension of 6.5 cm. Tumour had invaded beyond thyroid capsule with the presence of vascular invasion. The left lobe of thyroid and isthmus showed features of colloid goiter (pTNM- T4a N0 M0).

She was married for a year and was having irregular cycles with irregular flow. She was already on thyroxine 225 μ gm when she had come for the preconceptional counseling. Consultation was done with the CTVS team and she

was advised to perform an USG neck that showed post thyroidectomy status with no evidence of recurrence. Repeat TFT showed her to be euthyroid with 225 μ gm of thyroxine. She was advised to take folic acid 5 mg regularly and to continue her thyroxine. Post counseling she came with overdue of her periods by 4 weeks, but urinary pregnancy test done was negative. About 2 months later she came with a USG report confirming her to be pregnant (8+ weeks period of gestation) with a normal TFT (FT3 2.5 pg/ml, FT4 15.1 ng/dl and TSH 0.8 μ IU/ml). With the advice to continue thyroxine, folic acid and regular antenatal checkups, she had a total of 8 visits along with supplementary iron and calcium and was duly immunized with 2 doses of tetanus toxoid. The anomaly scan performed at 24 weeks was reassuring. TFT repeatedly done at 2 months interval was normal and she was on supplementary thyroxine. The presentation of the baby in subsequent antenatal checkups was found to be breech and the scan at 36 weeks reconfirmed a single live fetus in breech presentation with an estimated weight of 2710gms, adequate liquor and fundic placenta. So with the plan for elective caesarean section (CS) for primi breech, she was admitted at 38 + weeks and was consulted with the CTVS team as well as the anesthesiologists. Serum calcium (2.0 mol/l) and TFT (FT3 4.6 pg/ml, FT4 14.8 ng/dl and TSH 0.2 μ IU/ml) done prior to CS were normal. CS under regional anesthesia was uneventful with an outcome of alive female weighing 3200gm with good APGAR score. She was discharged on the 3rd post operative day with good health and with the advice to continue thyroxine.

Discussion

It is not rare that thyroid carcinomas are detected during pregnancy or in the early postpartum period. Recurrence or further growth of the preexisting thyroid malignancy could be attributed to the physiological changes that usually take place during pregnancy like the high levels of estrogen; also human chorionic gonadotropin (hCG) could create a favorable environment for tumor development and growth. Maternal thyroid gland secretes more thyroid hormone during early pregnancy in response to the thyrotropic activity of hCG that overrides the operation of the hypothalamic-pituitary-thyroid feedback system. This could partially explain an increase in the size of preexisting thyroid nodules as well as new thyroid nodule formation in pregnancy, as seen in the first case where the nodule was noticed only during pregnancy. Furthermore thyroid stimulating hormone (TSH) is known to stimulate tumor growth, invasion, angiogenesis and thyroglobulin secretion.

Management of thyroid cancer in pregnancy is controversial, as evidenced by disagreements cited in leading article

and journals. Regarding the first case there are reports supporting the suggestion of continuing pregnancy and deferring the surgery until after delivery. But still again advancement of the disease process requiring immediate thyroidectomy has also been reported.² The deferment of thyroidectomy till postpartum was decided in the 1st case but Chong KM et al³ has concluded by advising that thyroidectomy could be performed in midtrimester if the diagnosis had been made earlier and resection to be deferred until postpartum if malignancy was diagnosed in the later part of pregnancy. There is usually no need to terminate pregnancy in patients with thyroid carcinoma. Further, thyroidectomy in the second trimester is indicated for cases that are advanced or have an advancement of disease during pregnancy, otherwise it is better to defer resection till puerperium.⁴ Fear of future pregnancy (if the patient was to receive radioactive iodine, as it might cause abortions) lead us to perform CS in this patient whereas contrary to this Chow SM et al⁵ has stated that radioactive iodine (RAI) ablation did not have any deleterious effects on subsequent pregnancies. The recommendation for proper education and instruction to avoid conception within 1 year after RAI is mandatory, allowing for RAI clearance and hormonal stabilization, which was exactly followed in the 2nd case though she had not received RAI. Despite of active disease, patient was lucky enough not to show any progression or further proliferation of the disease, where as there are reports suggesting human chorionic gonadotropin attributing to further growth of existing thyroid malignancy.^{6,7} Thyroidectomy done at time of pregnancy has been shown to have more surgical and endocrine complications.⁴ So it was better for our patient to have deferred surgery post CS.

In the 2nd case, patient was educated enough to come for preconceptional counseling that helped the obstetrician to consult the CTVS team and advise her accordingly. A study conducted by Pomorski L⁸ has recommended that if conception takes place after remission is confirmed and not earlier than 1 year after thyroidectomy with complementary treatment, then pregnancy outcome is good. This patient had also visited the antenatal clinic after a year of thyroidectomy and was on supplementary thyroxine with both the USG report of the neck and TFT being normal. A study conducted by Hirsch D et al⁹ in 63 women who had undergone treatment for papillary carcinoma of thyroid and were pregnant at least once concluded that pregnancy in women with thyroid cancer survivors does not pose an increased risk of recurrence or progression and also that TSH values do not have to remain suppressed during pregnancy. Again as recommended in a guideline by the British Thyroid Association and the Royal College of

Physician (2006), thyroxine should be supplemented during the entire pregnancy and to increase the dose as soon as pregnancy is confirmed. It is further advised to adjust the dose according to the monitoring of TFT, which was done in the 2nd case where monitoring of TFT (FT3, FT4 and TSH) was done every 2 monthly and supplementation of high dose of thyroxine (225 µgm) was administered, that lead to an uneventful pregnancy and good outcome.

Conclusion

Pregnancy in patients who have papillary thyroid cancer or who have already undergone resection of the malignancy does not seem to pose any complications in the form of progression, proliferation or recurrence, provided there is proper preconceptional counseling, evaluation of the tumour/recurrence with USG and TFT along with a multidisciplinary approach. Thyroidectomy can be deferred till postpartum if the disease is diagnosed in the later part of pregnancy or till there is further advancement of the malignancy.

References

1. Mazzaferri EL. Approach to the pregnant patient with thyroid cancer. *J Clin Endocrinol Metab.* 2011; 96(2):265-72.
2. Driggers RW, Kopelman JN, Satin AJ. Delaying surgery for thyroid cancer in pregnancy. A case report. *J Reprod Med.* 1998; 43(10):909-12.
3. Chong KM, Tsai YL, Chuang J, Hwang JL, Chen KT. Thyroid cancer in pregnancy: a report of 3 cases. *J Reprod Med.* 2007; 52(5):416-8.
4. Alves GV, Santin AP, Furlanetto TW. Prognosis of Thyroid Cancer Related to Pregnancy: A Systematic Review. *Journal of Thyroid Research.* 2011, Article ID 691719, 5 pages
5. Chow SM, Yau S, Lee SH, Leung WM, Law SC. Pregnancy outcome after diagnosis of differentiated thyroid carcinoma: no deleterious effect after radioactive iodine treatment. *Int J Radiat Oncol Biol Phys.* 2004; 15;59(4): 992-1000.
6. Kobayashi K, Tanaka Y, Ishiguro S, Mori T. Rapidly growing thyroid carcinoma during pregnancy. *J Surg Oncol.* 1994; 55(1):61-4
7. Genoud M, Oliva J, Alonso G F, Nallar M and Harach HR. Proliferative activity in pregnancy related thyroid papillary carcinoma. *Endocrine Pathology.* 2004; Volume 15, Number 2, 179-182

8. Pomorski L, Bartos M, Narebski J. Pregnancy following operative and complementary treatment of thyroid cancer. *Zentralbl Gynakol.* 2000;122(7):383-6.
9. Hirsch D, Levy S, Tsvetov G, Weinstein R, Lifshitz A, Singer J, Shraga-Slutzky I, Grozinski-Glasberg S, Shimon I, Benbassat C. Impact of pregnancy on outcome and prognosis of survivors of papillary thyroid cancer. *Thyroid.* 2010; 20(10):1179-1185.