

Neck Masses as The First Presentation of Occult Papillary Thyroid Carcinoma: Case Series
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Background: Papillary Thyroid Carcinoma (PTC) is the most common thyroid cancer. It can be found incidentally during thyroidectomy or can present as an enlarged cervical lymph node which is difficult to be diagnosed unless confirmed by ultrasonography and fine needle aspiration cytology (FNAC).

Objective: The aim of the current study is to report our experience in diagnosing Occult PTC (OPTC) presenting as a cervical mass without any evident thyroid enlargement.

Patients and methods: Retrospective reviews of reports of all patients presented to our hospital complaining of a mass in the neck were enrolled in this study. Data regarding their history, investigations, ultrasound and Fine Needle Aspiration Cytology (FNAC) were reviewed. Cases investigated and diagnosed initially as OPTC were included. Diagnosis was confirmed by histopathological examination of the resected specimens.

Results: Eleven out of 62 (17.7%) cases with cervical masses were diagnosed as OPTC based on ultrasound and FNAC findings later confirmed by histological examination of their specimens. Six of them were females and 5 were males with a mean age of 36.9 years. The mean duration of these masses was 2.3 months. Hemithyroidectomy was done for 2 patients for unilateral small masses in the thyroid with the remainder undergone a total thyroidectomy with modified lymph node dissection.

Conclusion: OPTC can present for the first time as a neck mass without clinically apparent thyroid enlargement. Physicians should keep the possibility of OPTC in the differential diagnosis of all adult neck masses in order to avoid any delay in diagnosis and to achieve the proper management plan.

Keywords: Cervical mass, FNAC, Ultrasound, Papillary thyroid carcinoma, Retrospective reviews, Case series, Dijlah University.

INTRODUCTION

Neck masses commonly present to general practitioners (GPs) and could be the single presenting complaint in a patient with head and neck malignancy notably for those over 40 years of age¹. There are often no associated symptoms other than the recognition of a new lump noted incidentally on palpation or noticed by another individual. Evaluation of the neck mass can be difficult because of the wide differential diagnosis ranging from infection to malignancy. Therefore, thorough history and physical examination are essential to decide the proper management.

Papillary thyroid carcinoma (PTC) is an epithelial malignant tumor of the thyroid gland and accounts for almost 80% of thyroid cancers^{2,3}. About 21.5% of PTCs present with lymph node (LN) metastasis at the time of diagnosis⁴, however, even with LN metastasis, PTC has the best prognosis^{5,6}. Occult papillary thyroid carcinoma (OPTC) that is less than 1.5 cm size is difficult to be diagnosed by only palpating the LN unless assisted by

ultrasound of the soft tissues of the neck⁷. Thick and irregular lining of a cyst are the ultrasound features highly suggestive of metastasis. The origin of these cysts is still controversial; some researchers proposed that it could represent a malignant change of ectopic thyroid tissue. Others believe that it signifies metastasis from an occult thyroid lesion to the LN which in turn, suffered central liquefaction and cystic generation^{8,9}.

Fine Needle Aspiration Cytology (FNAC) is a safe and cost-effective investigation with an overall accuracy of 93.1% (73.3–98.0%), henceforth, it is considered as a first-line diagnostic test for patients at increased risk of malignancy^{10,11}. Other modalities like contrast-enhanced CT or Magnetic Resonance Imaging (MRI) are extremely valuable for the management of patients with cystic neck lesions, especially where the diagnosis remains uncertain after standard investigations have been performed^{12,13}.

The aim of the current study is to report our experience in diagnosing OPTC presenting as a cervical mass without any evident thyroid enlargement.

PATIENTS AND METHODS

A retrospective study reviewing the reports of patients consulted Al-Zahrawe Private Hospital complaining from a mass in the neck with no apparent thyroid enlargement between 2008 and 2018. Patients were investigated with ultrasound and FNAC with their initial diagnosis as OPTC. Later, these patients underwent hemi or total thyroidectomy and their final diagnosis was confirmed by histopathology. Data regarding the patient's age, sex, ultrasound results with pathological findings, management and outcomes were collected.

Ethical approval:

This study was ethically approved by the Institutional Review Board of the Faculty of Medicine, Ninevah University. Written informed consent was obtained from all participants. This study was executed according to the code of ethics of the World Medical Association (Declaration of Helsinki) for studies on humans.

Statistical analysis:

The collected data were introduced and statistically analyzed by utilizing the Statistical Package for Social Sciences (SPSS) version 20 for windows.

RESULTS

Eleven patients out of 62 cases with cervical masses were diagnosed with OPTC. The diagnosis was based on clinical findings, FNAC, sonographic features and confirmed with the histological examination of the mass

and the resected thyroid gland (**Table 1**). Age ranged between 20-60 years with a mean age of 36.9 years. Five patients were males while six were females. Mean duration of the mass was 2.3 months. Two of these masses were in the right posterior triangle (RPT), one in the left posterior triangle (LPT), one in the left supraclavicular (LSC) region and another two cases in the right supra clavicular (RSC) region with the remaining five cases located in mid cervical region (**Figures 1 and 2**). Thorough history and clinical examination were reviewed to exclude any history of head and neck diseases or metastasis from elsewhere in the body.

Ultrasonography revealed that in six out of 11 lymph node masses were solid while the remaining five were cystic. The age of patients with cystic masses ranged between 20-34 years. Furthermore, lymph node enlargement was associated with multiple small nodules at one lobe of the thyroid in two patients and in both lobes in the rest of the cases. FNAC indicated malignant cytology highly suggestive of PTC in all patients.

Hemithyroidectomy was done for two patients with unilateral small masses in the thyroid while the remainder experienced a total thyroidectomy with modified lymph node dissection. All patients underwent adjuvant radioiodine therapy. Follow-up of these patients revealed all were living a disease-free life with lifelong thyroid supplements except a 25 years old male with thoracic vertebrae metastasis deceased six months after the surgery. Another patient, a 52 years old male developed a recurrence after one year for which he had another operation.

Table 1. Presenting the clinical features of 11 cases with cervical masses.

Case No.	Gender & age	Location of the mass	Duration of the mass/ months	U/S of the cervical mass	U/S of the thyroid	FNAC	Follow up
1	M60	RPT	2	Solid mass 2 cm	Slight enlargement	Malignant cytology	No recurrence after 6 years
2	F20	RPT	5	Complex cystic mass 5 cm	With a small nodule	Not done	No recurrence for 3 years
3	M25	LPT	3	Complex cystic 6 cm	Multiple small nodules	Malignant cytology	Patient died after 6 months because of vertebral metastasis
4	F50	LSC	2	Solid mass 2 cm	Multiple small nodules	Not done	No recurrence after 2 years
5	M32	RSC	2	Solid mass 2 cm	Slightly enlarged thyroid with multiple small nodules	Malignant cytology suggestive of PTC	No recurrence after 4 years
6	F27	L cervical mass ND	2	Complex cystic mass 2.5 cm	Small nodule in left side thyroid	Not done	No recurrence after 2 years
7	M43	R cervical mass ND	1	Solid mass 2.5 cm	Multiple small nodules in thyroid	Malignant cytology suggestive of PTC	No recurrence after 3 years
8	M52	L cervical mass ND	3	Solid mass 2 cm			Recurrence after one year re-operated then no recurrence after 2 years
9	F 43	R mid cervical mass	1	solid mass 2.4 cm	mutinodular goiter	malignant cytology suggestive of PTC	No recurrence after 2 years
10	F34	L mid cervical mass	1.5	Cystic mass 3.5 cm	multiple small nodules	colloid fluid containing malignant cells	No recurrence after 3 years
11	F20	RSC	3	Cystic mass 3 cm	normal thyroid gland	malignant cytology suggestive of PTC	No recurrence after 3 years

RPT: Right posterior triangle; LOT: Left posterior triangle; LSC: Left supraclavicular; RSC: Right supraclavicular. ND: Not determined; PTC: Papillary thyroid carcinoma; U/S: ultrasonography.

All patients had adjuvant radioiodine therapy postoperatively. Follow-up of these patients was disease-free life with lifelong thyroid supplements except one male 25 years old who had thoracic metastasis and died six months after surgery.



Figure 1. Supraclavicular mass in a patient without clinically apparent thyroid enlargement.

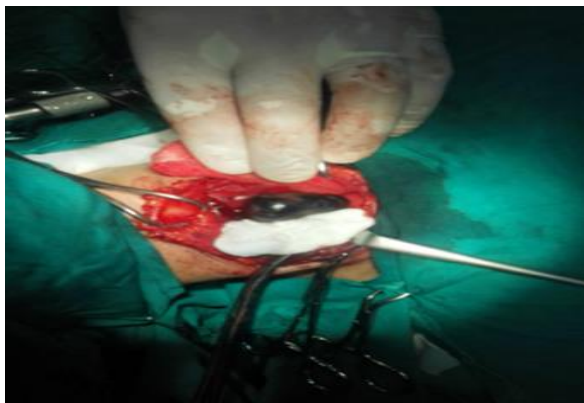


Figure 2. Intra operative cystic cervical mass filled with hemorrhagic fluid.

DISCUSSION

Head and neck masses are often seen in clinical practice. Their differential diagnosis include congenital, inflammatory and neoplastic lesions¹⁴. In this study, eight of the 11 cases presented as a sole mass in the neck without clinically apparent thyroid enlargement. Our goal was to determine whether it is a benign or malignant mass bearing in mind that any patient with a history of persistent adenopathy for more than 6 weeks should raise suspicion of malignancy particularly PTC. This is especially if it was a large, painless, firm and immobile mass within the posterior triangle or supra clavicular space^{15,16}.

Frequently, PTCs undergo cystic transformation in the primary tumor and in the metastatic lymph node, therefore, cystic changes in

cervical lymph nodes are highly suggestive of metastatic PTC with a reported incidence between 6.7% and 13%⁹. Branchial cysts have similar ultrasonic features to cervical cystic lymph nodes metastasis with thickened outer walls, internal echoes and internal nodularity. These also share the same location rendering it difficult to differentiate between the two by the ultrasound alone¹⁷. Once the involvement of vital structures was ruled out with appropriate imaging, the clinician can proceed with FNAC to provide further information. This may involve cytology, gram stain, and bacterial and acid-fast bacilli cultures while avoiding complications of open biopsy with 77% to 97% sensitivity and 93% to 100% specificity¹⁸. In the current study FNAC was 100% accurate.

In indeterminate cases, a repeat FNAC or core biopsy can be performed. In 2018, Trimboli and Giovanella argued the high accuracy and safety of ultrasound-guided core biopsy with a 96% detection rate for malignancy¹⁹. In the current study, histological examination of the resected thyroid glands demonstrated two or more foci of PTC in almost all thyroid glands specimens. This supports the hypothesis of enlarged LNs being a cancer metastasis rather than an aberrant thyroid tissue undergoing malignant transformation which is correspondent with the findings from other studies⁷.

The age range of patients with cystic neck masses was between 20-34 years which is in line with other reports. This can be explained by the fact that complete cystic degeneration of the nodes typically occurs in young adults. Therefore, detecting a cystic mass in the neck would alert the clinician of an OPTC^{3,20}.

Verge *et al.*, reported seven cases with OPTC presented initially as cystic masses in the lateral aspect of the neck without any clinical thyroid enlargement²¹. Meanwhile, Seven *et al.* reported nearly 11% of patients with lateral cervical cysts represent lymphatic metastases from occult thyroid carcinoma²². In 2018, Yehuda *et al.* reported the histologic analysis of cervical masses and determined an overall rate of malignancy of 10.7%. Moreover, in 2020, Kim *et al.* demonstrated the incidence of cystic LN metastases is relatively rare compared to solid LN with cystic lateral LN metastases are associated with an aggressive tumor behavior in PTC patients²³.

The thyroid gland should be routinely checked in any patient with persistent cervical masses particularly for those over 40 years age. Ultrasonography is recommended for such patients given its simplicity and cost-effectiveness compared to CT and MRI. If malignancy is suspected, ultrasound guided FNA is an effective procedure to define the origin of the primary tumor.

In conclusion, occult papillary thyroid carcinoma can present for the first time as a neck mass without clinically apparent thyroid enlargement. Physicians should keep the possibility of OPTC in the differential diagnosis of all adult neck masses in order to avoid any delay in diagnosis and to achieve the proper management plan.

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