

# Management of Thyroid Carcinoma with Significant Mediastinal Involvement without Sternotomy.

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## ABSTRACT

Papillary thyroid carcinoma usually presents as a palpable thyroid swelling, and presenting as cervical lymphadenopathy is uncommon. Metastasis to the cervical lymph nodes could have several primary sources. A 70 year old male presented with painless left cervical mass which was insidious in onset, gradually increasing in size since past one year. Physical examination revealed an oval left cervical mass, extending from anterior border of sternocleidomastoid (SCM) muscle to the posterior triangle of neck at level III, IV and V. Plain and contrast enhanced Computed tomography (CT) of neck and thorax demonstrated an ill defined irregular intensely enhancing multi-lobulated lesion in the left supraclavicular region. Fine needle aspiration cytology (FNAC) was suggestive of either a metastatic lesion or a primary lesion. Level V lymph node biopsy suggested papillary carcinoma thyroid. The patient underwent total thyroidectomy with bilateral lymph node dissection with excision of mediastinal lymph nodes via cervical approach without sternotomy. Histopathological examination of the specimen confirmed Papillary Thyroid Carcinoma (conventional type) with secondaries to the neck. On discharge, the patient was given radioactive iodine therapy for two weeks, followed by lifelong oral thyroxine. No signs of recurrence were noted in the follow up visits. A combination of radiological and histopathological investigations can help to assess a cervical mass of thyroid origin. The transcervical approach is simpler and safer than the transsternal approach and avoids the morbidity of a sternal split.

**Keywords:** Thyroidectomy, Carcinoma of thyroid, Lymphatic metastasis.

## INTRODUCTION

Differentiated thyroid cancers, including papillary and follicular, account for more than 90% of thyroid cancer patients. Thyroid carcinoma presenting solely as a cervical swelling is uncommon and has been reported to be present in approximately 10–21% of all thyroid carcinomas. Though thyroid cancer commonly develops regional lymphatic metastases, cervical lymph nodes metastasis could arise from several primary sources in the head and neck region. Palpable nodal disease is present in approximately 5 to 10% of patients with papillary thyroid cancer; while a preoperative neck ultrasound can detect lymph node disease in up to 30% of patients. A combination of radiological and histopathological investigations can help to assess a cervical mass of thyroid origin. Surgical treatment of mediastinal lymph node metastasis requires a more extensive operation, which can increase the risk of

complications and may eventually affect their quality of life. Superior mediastinal lymphadenectomy can be accomplished either by a transcervical or transsternal approach. In this report we present a case of papillary thyroid carcinoma who underwent thyroidectomy via a transcervical approach.

## CASE REPORT

A 70 year old male presented to our outpatient clinic with painless left cervical mass which was insidious in onset, gradually increasing in size since past one year. The patient also complained of hoarseness of voice since past six months. The patient denied any other complaints or history of any other major illness. Physical examination revealed an oval left cervical mass, 6x5 cm, extending from anterior border of sternocleidomastoid (SCM) muscle to the posterior triangle of neck at level III, IV and V [Figure 1]. On palpation, it was hard in consistency with no rise in temperature, though tenderness was present. The swelling was moving horizontally normally but vertical movement was restricted. Examination of the ears, oral cavity and nose was within normal limits. Differential diagnosis of either tubercular lymphadenitis or secondaries in the neck

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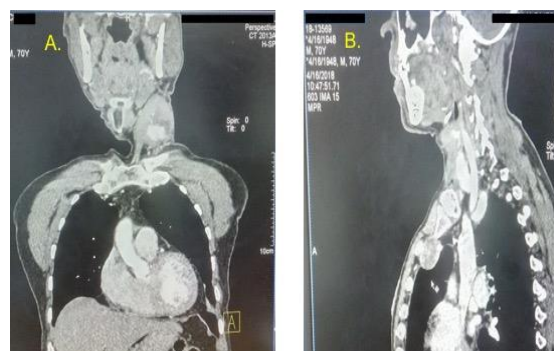
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was formed. Testing for vocal cords revealed palsy on the left side. Plain and contrast enhanced Computed tomography (CT) of neck and thorax demonstrated an ill-defined irregular intensely enhancing multi-lobulated lesion in the left supraclavicular region measuring 8.9 x 5.1 x 7.3 cm with calcification and necrotic areas causing displacement of carotid artery and vocal cord medially and internal jugular vein (IJV) laterally and sternocleidomastoid (SCM) muscle anteromedially [Figure 2]. Multiple calcified pretracheal and paratracheal lymph nodes were found and calcification in the left lobe of thyroid was observed as well. Mediastinum revealed a well defined peripherally enhancing lesion measuring 2.6 x 2.8 cm with peripheral calcification in the anterior mediastinum behind the sternum. Right apical pleural thickening was seen with tiny lung nodules with speculated margins over right middle and bilateral lower lobe. Tubercular lymph node was suspected and Fine needle aspiration cytology (FNAC) of the mass was done which found atypical cells with hyperchromatic nucleus, few eccentric nucleus, abundant cytoplasm which could be suggestive of either a metastatic lesion or a primary lesion [Figure 3A]. Level V lymph node biopsy revealed metastatic tumor cells in branching papillary pattern and a few showed nuclear grooving which was suggestive of papillary carcinoma thyroid [Figure 3B]. After this the patient requested for discharge due to family reasons. The patient was admitted again and after obtaining fitness, underwent total thyroidectomy with bilateral radical neck dissection and central compartment clearance with excision of mediastinal lymph nodes via cervical approach without sternotomy. Transverse incision was made on the neck about 3 cm above the suprasternal notch. Flap was raised superiorly upto cricoid and inferiorly upto suprasternal notch. Strap muscles were identified and removed. Thyroid gland was visualized and removed from all attachments, preserving the right recurrent laryngeal nerve [Figure 4]. Parathyroids were removed as well. Left radical neck dissection was done removing level II, III, IV and V nodes, spinal accessory nerve, IJV and SCM muscle. Right modified radical neck dissection was done preserving the spinal accessory nerve. IJV and SCM on right side. Right internal mammary node was palpated and removed. Intercostal drainage tube was placed. After achieving hemostasis two drains were placed in the neck and the wound was closed with staples. On site histopathological examination found papillary fronds lined by atypical cells having overlapping nuclei with peripheral chromatin condensation, grooving at places confirming Papillary Thyroid Carcinoma (conventional type) with secondaries to the neck [Figure 5]. Internal mammary node was excised. On discharge, the patient was advised iodine free diet and was given radioactive iodine therapy for two weeks, after

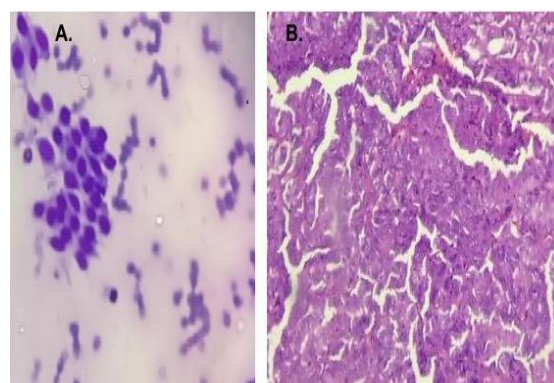
which oral thyroxine 200 microgram was started to maintain TSH below 0.1mIU/L. No signs of recurrence were noted in the follow up visits.



**Figure 1: Left cervical mass; 6 x 5 cm; extending from anterior border of SCM to posterior triangle of neck at level III, IV, V**



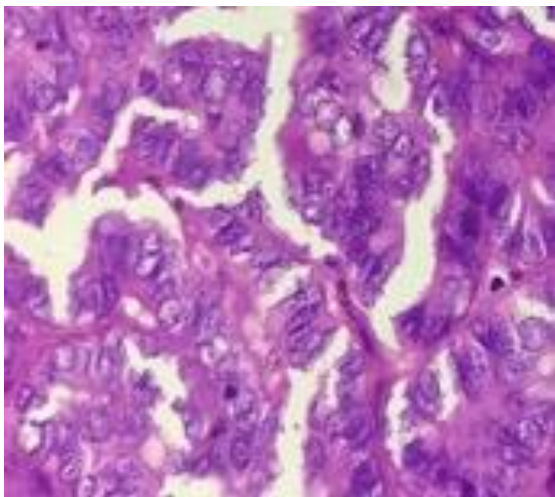
**Figure 2: CT scan showing (A.) an ill defined irregular intensely enhancing multilobulated lesion with displacement of carotid artery and VC medially & IJV laterally in the left supra clavicular region. (B.) A well defined lesion in the Right anterior mediastinum behind sternum.**



**Figure 3: (A.) FNAC showing atypical cells with hyperchromatic nucleus, few eccentric nucleus, abundant cytoplasm (B.) Level V Lymph node biopsy showing metastatic tumor cells in branching papillary pattern and a few show nuclear grooving.**



**Figure 4: Total thyroidectomy with bilateral lymph node dissection with excision of mediastinal lymph nodes via cervical approach**



**Figure 5: Histopathological examination showing papillary fronds lined by atypical cells having overlapping nuclei with peripheral chromatin condensation, grooving at places, confirming Papillary Thyroid Carcinoma**

## DISCUSSION

Papillary thyroid cancer typically spreads in a stepwise fashion from the thyroid to the central neck and then laterally to the jugular chain nodes. If there is nodal involvement identified in the lateral neck, it is presumed that there is disease in the central neck as well. Level III and level IV are the most common sites of nodal metastatic disease in the lateral neck compartment; disease is rarely identified in level I. The classical method for superior mediastinal lymphadenectomy involves a sternal split that may either be partial or complete. Although this approach provides superior exposure, there is significant morbidity associated with this method. Obviously, if the mediastinal involvement extends beyond the superior mediastinum, or if the disease adheres to or invades mediastinal structures, this approach may be necessary. Reported complications of the transsternal approach have included pneumothorax,

mediastinal hematoma, chest wound dehiscence, and infection and mediastinitis. The transcervical approach, however, is very safe. There were no intraoperative complications in our patient, and conversion to a sternotomy was not required.

Khoo and Freeman reported 30 patients who underwent transcervical superior mediastinal dissection for metastatic papillary thyroid carcinoma. No patient in their study required conversion to a median sternotomy. All 30 mediastinal dissection specimens were later shown to be positive for metastatic papillary carcinoma on histopathologic examination. After a median follow-up of 5 years, survival was 100%. Twenty-nine patients were disease free, whereas one patient had distant metastases. More importantly, the local and regional control was excellent, and no patient has had either local or regional relapse. The only significant complication was temporary (70%) and permanent (50%) hypoparathyroidism, which was not unexpected. Niederle et al, on the other hand, suggested that the transsternal approach is necessary for a thorough mediastinal dissection and that the transcervical approach provides inadequate exposure. However many previous case series, in addition to our present case, show that this approach is not necessary to achieve good results.

Recently, Moritani et al investigated the effect of superior mediastinal metastasis on the prognosis of patients with papillary thyroid carcinoma. In their study a total of 488 patients were included, 76% of which were operated via transcervical approach and rest by sternotomy. The authors concluded that the prognosis of patients with superior mediastinal metastasis dissected by sternotomy was significantly poorer. In a comparison of distant-free survival between patients that were dissected either by the transcervical approach or by sternotomy, as well as patients without superior mediastinal metastasis, there was no significant difference between patients with superior mediastinal metastasis dissected transcervically and those without metastasis ( $p = 0.076$ ). However, the distant-free survival for patients with superior mediastinal metastasis dissected by sternotomy was poorer than the 2 other categories ( $p = 0.000$ ; the median distant-free survival was 1317 days). In India, Mehrotra et al reported the 5-year and 10-year overall survival to be 74.6% and 58% for patients with medullary thyroid carcinoma undergoing thyroidectomy via transternal approach.

Recently, the trans-oral approach to isolated papillary thyroid cancer metastases to retropharyngeal lymph nodes has been reported. Some surgeons reported ultrasonography-guided trans-oral resection of isolated retropharyngeal lymph nodes metastasis without severe complications. Similarly, Goepfert et al successfully performed trans-oral robot-assisted surgery for

retropharyngeal lymph nodes metastasis of the recurrent papillary thyroid cancer.

## CONCLUSION

Papillary thyroid carcinoma presenting as a cervical lymphadenopathy is rare and requires combination of imaging and pathological investigations for confirmation. Mediastinal lymph node dissection is as effective surgical treatment for thyroid carcinoma, though the prophylactic role of this procedure in patients with mediastinal lymph node involvement remains a topic of debate. The transcervical approach is simpler and safer than the transsternal approach and avoids the morbidity of a sternal split, without compromising on the surgical exposure.

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