CASE REPORT

Thyroid cancer: A case of parapharyngeal extension

Momina Amir, Shahzaib Asif, Rabbya Naseem, Shayan Khalid, Muhammad Faisal, Raza Hussain

Abstract

Thyroid cancer is frequently encountered in clinical settings. However, its metastasis to the parapharyngeal space is exceedingly uncommon, comprising only 0 to 5 % of head and neck neoplasms. This case report highlights the extension of papillary thyroid cancer to the parapharyngeal space, its treatment, and outcome. If a mass is observed in the parapharyngeal region on imaging, clinicians should contemplate the likelihood of thyroid cancer and rule it out as a potential diagnosis.

Keywords: Thyroid gland; Parapharyngeal space; Mandibulotomy.

DOI: https://doi.org/10.47391/JPMA.20797

Introduction

Papillary thyroid carcinoma is known for its inert nature. It spreads through lymphatics. Though vascular spread is rare, when it occurs, it is usually to the bone, brain, lungs, and soft tissue. Extension to the parapharyngeal space is not commonly reported in the literature, however, quite a few cases have been reported.[1,2] The reported prevalence of parapharyngeal invasion is 0.43% to 2.5%.[101] There are various approaches to the removal of parapharyngeal mass including transoral or transcervical, Trans parotid, mandibulotomy and mandibular swing, trans mastoid, and infratemporal fossa.[3] The extension of thyroid cancer to parapharyngeal space is exceedingly uncommon, comprising only 0 to 5 % of head and neck neoplasms.[4] Here we present the case of a 45-year-old male with thyroid cancer extending into the parapharyngeal space.

Case Report

A 45-year-old man presented to Shaukat Khanum Memorial Cancer Hospital and Research Centre, Lahore, on March 22, 2023, with a painless neck swelling for three months. He was Hepatitis C positive. There was no evidence of thyroid dysfunction or any other relevant medical history. He had no associated symptoms of hoarseness, dysphagia, or dysphonia. He had no family history of cancer. He had a history of smoking and Naswar (a form of chewable tobacco used in Pakistan) use, but he had quit both habits eight years ago. On physical examination, enlarged bilateral cervical lymph nodes were observed, with the largest being 4x4 cm in size on the right side. It was firm in consistency, mobile, painless on palpation, not fixed to adjacent structures and the overlying skin was normal. The thyroid mass was not palpable. A healed scar from a previous biopsy was also visible on the right side of the neck. The basic investigations, including a complete blood count and renal function tests, were all within the normal range. An ultrasound-guided Fine Needle Aspiration Cytology was performed, which showed atypical cells suggestive of epithelioid neoplasm. Therefore, a core biopsy of right-sided neck swelling was performed to confirm the diagnosis, which revealed metastatic papillary carcinoma of the thyroid (Figure 1). For further evaluation, a Magnetic Resonance Imaging (MRI) scan was requested that demonstrated a nodule of 1.4x1.1 cm in the right lobe of the thyroid gland. Multiple enlarged necrotic bilateral cervical and upper mediastinal lymph nodes were also reported (Figure 2) To rule out distant metastasis, Computed Tomography (CT) of the chest, abdomen, and pelvis was conducted. It revealed the enlargement of bilateral cervical, supraclavicular, and right upper paratracheal lymph nodes. The case was discussed in a multi-disciplinary team, and it was agreed that the most appropriate plan of action was to perform a total thyroidectomy and bilateral neck dissection.

The patient had a total thyroidectomy with bilateral neck dissection (Level II, III, IV, V, VI) including paratracheal lymph

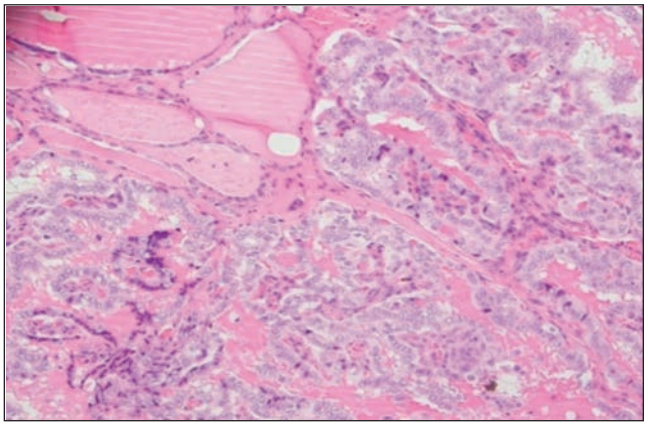

Figure-1: Histological Examination of the thyroid section reveals neoplasm composed of papillae containing a central thin core of fibrovascular tissue lined by layers of tumour cells with slightly eosinophilic cytoplasm and crowded oval nuclei.

Shaukat Khanum Memorial and Cancer Hospital, Lahore, Pakistan.
Correspondence: Shayan Khalid. e-mail: shayankhalid@skm.org.pk
ORCID ID: 0000-0002-3237-0669

Submission completed: 03-06-2024 **1st Revision received:** 10-09-2024
Acceptance: 12-06-2025 **Last Revision received:** 10-06-2025

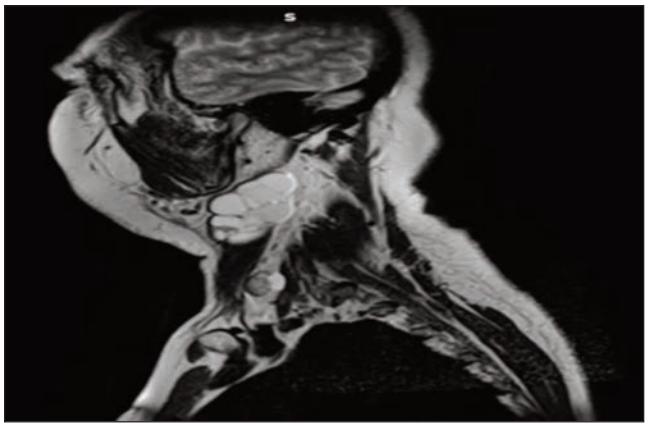

Figure-2: Magnetic Resonance Imaging (coronal and axial section) demonstrates a nodule of 14 x 11mm in the right lobe of thyroid gland. Multiple enlarged necrotic bilateral cervical and upper mediastinal lymph nodes are also present.

nodes. Thyroidectomy was performed using a skin crease incision over the neck. The incision was extended superiorly for lip splitting to approach the parapharyngeal region. Thyroidectomy was performed while saving the bilateral recurrent laryngeal nerves and parathyroid glands. Sternocleidomastoid muscle was delineated bilaterally for lateral neck dissection. Bilateral internal jugular veins and spinal accessory nerves were saved. The dissection in the parapharyngeal region was performed using a left-sided lower lip split mandibulotomy approach. Incision was made in the right lingual mucosa going posteriorly up to the superior pole of the tonsil. Intraoperatively, huge bilateral nodes extending from level 2 to 3 were encountered. The nodes were abutting the internal jugular vein bilaterally, but more adherent to it on the right side yet separable. Around 4x5 cm mass was excised from right parapharyngeal space, via mandibulotomy. Despite the aggressive nature of the disease, bilateral recurrent laryngeal nerves were saved. The patient experienced minimal post-operative morbidity, without any cranial nerve palsies or indications of hypocalcaemia. In addition, the histological examination of the thyroid specimen showed multifocal thyroid cancer. The largest deposit being 2.1 cm. The resection margins were free of tumour. Metastatic carcinoma was detected in level-3 right cervical lymph nodes, level-2 left cervical lymph nodes and level-1 right paratracheal lymph node. Also left-sided paratracheal lymph nodes were positive for cancer. The tumour was staged by a senior histopathologist as T2 N1b M0 according to TNM (T=Tumour, N=Nodal, M=metastatic) classification of thyroid cancer on final histopathology.[5] The follow-up ultrasound scan performed two months after the surgery was suggestive of recurrence in thyroid surgical bed bilaterally; also the pathological enlargement of level II cervical nodal mass was consistent with disease involvement. The thyroglobulin tumour marker was reported to be 1388. The patient is currently on Radioactive Iodine Ablation and six-monthly follow-ups.

Discussion

The presentation of thyroid carcinoma involving retropharyngeal and parapharyngeal lymph nodes, as demonstrated in the current case, represents a rare manifestation of thyroid cancer. According to literature, only 112 cases of metastasis to Parapharyngeal Space have been reported in the past 20 years. Despite its infrequency, comprehending the anatomical basis and diagnostic challenges associated with this presentation is paramount for effective management.[6]

The parapharyngeal space is an anatomically complex region, serving as a potential space bounded by various structures. Rouvier's description of lymphatic drainage patterns highlights the intricate network connecting the lateral thyroid lymph vessels to the retropharyngeal lymphatics, facilitating the spread of tumour cells to the parapharyngeal space.[1] This anatomical understanding is critical for recognising the potential pathways of metastasis and guiding diagnostic and therapeutic interventions.

In this case, the diagnostic challenge of isolated cervical lymphadenopathy underscores the importance of thorough evaluation. Imaging modalities such as CT and MRI, as well as fine needle aspiration cytology and core biopsy, play crucial roles in confirming the diagnosis and assessing the extent of the disease.[7]

Surgical intervention remains the cornerstone of the treatment for metastatic thyroid carcinoma, with various approaches available depending on the extent and location of the disease.[4] The patient in the current case opted for a total thyroidectomy with bilateral neck dissection, including parapharyngeal lymph node dissection via a mandibulotomy approach. This meticulous surgical technique aims to preserve critical structures while effectively removing the diseased tissue.

Post-surgical management often involves adjuvant therapies such as Radioactive Iodine Ablation (RAI) to target residual disease and prevent recurrence, as seen in the current case[6] Regular follow-up with imaging studies, particularly ultrasound, is essential for early detection of recurrence.[8] The combination of stimulated thyroglobulin levels and neck ultrasound has been reported to have a high sensitivity in detecting loco-regional disease, emphasising its utility in post-treatment surveillance.[9]

In the afore-mentioned case, the identification of multifocal thyroid cancer with lymph node and parapharyngeal space extension aligns with these prognostic factors, necessitating comprehensive treatment strategies and

close surveillance to address potential recurrences. Studies have also identified several factors associated with thyroid bed recurrence, including tumour size, lymph node metastasis, and the presence of calcifications.[10] These findings emphasise the importance of ongoing monitoring and early intervention in cases of recurrence to optimise patient outcomes.

In summary, this case study highlights the significance of a multidisciplinary approach to managing metastatic thyroid carcinoma involving retropharyngeal and parapharyngeal lymph nodes. Integrating anatomical knowledge, diagnostic modalities, and therapeutic strategies is essential for achieving optimal outcomes in these rare but clinically significant presentations.

Conclusion

This case underscores the necessity to include thyroid carcinoma in the differential diagnosis of parapharyngeal masses. Another important highlight of this case is pre-operative evaluation and decision of surgical approach when encountering a thyroid tumour with features suggestive of parapharyngeal extension.

Written Consent to publish: Patient's consent to publish his case was taken.

Disclaimer: None.

Conflict of Interest: None to declared.

Funding Sources: None

References

1. Khaled H, El Omri M, Rim F, El Korbi A, Naourez K, Rachida B, et al. Parapharyngeal metastasis from papillary thyroid micro-carcinoma. Pan Afr Med J 2020;37:121. doi.org/10.11604/pamj.2020.37.121.25887
2. Limaiem F, Rehman A, Mazzoni T. Papillary thyroid carcinoma. [Online] [Cited 2025 February 11]. Available from: URL: https://www.statpearls.com
3. Yuan M, Kumar A. Collaborative approach for patient management: parapharyngeal metastasis of papillary thyroid carcinoma. J Otolaryngol Rhinol 2023;9:134. doi.org/10.23937/2572-4193.1510134
4. Yazici D, Uguz A. A thyroid tumour extending to the parapharyngeal space. BMC Ear Nose Throat Disord 2006;6:1-6. doi.org/10.1186/1472-6815-6-1
5. Mattavelli D, Ferrari M, Taboni S, Morello R, Paderno A, Rampinelli V, et al. The 8th TNM classification for oral squamous cell carcinoma: what is gained, what is lost, and what is missing. Oral Oncol 2020;111:104937. doi.org/10.1016/j.oraloncology.2020.104937
6. Masmoudi M, Hasnaoui M, Njima M, Zitouni C, Thabet W, Chebil E, et al. Parapharyngeal lymph node metastasis from papillary thyroid carcinoma. Ear Nose Throat J 2021;100:01455613211045566. doi.org/10.1177/01455613211045566
7. Frasoldati A, Pesenti M, Gallo M, Caroggio A, Salvo D, Valcavi R. Diagnosis of neck recurrences in patients with differentiated thyroid carcinoma. Cancer 2003;97:90-6. doi.org/10.1002/cncr.11074
8. Cho JS, Park MH, Ryu YJ, Hwang MJ, Shin SH, Kim HK, et al. Malignant thyroid bed mass after total thyroidectomy. J Korean Surg Soc 2013;85:97-103. doi.org/10.4174/jkss.2013.85.2.97
9. Cirocchi R, Trastulli S, Sanguinetti A, Cattorini L, Covarelli P, Giannotti D, et al. Recurrent differentiated thyroid cancer: to cut or burn? World J Surg Oncol 2011;9:1-4. doi.org/10.1186/1477-7819-9-37
10. Zaheer S, Tan A, Ang ES, Loke KS, Kao YH, Goh A, et al. Post-thyroidectomy neck ultrasonography in patients with thyroid cancer and a review of the literature. Singapore Med J 2014;55:177-83.

Author Contribution:
MA & SA: Concept, design, data acquisition, analysis and interpretation.
RN: Drafting.
SK: Revision and agreement to be accountable for all aspects of the work.
MF & RH: Final approval.