International Journal of Otolaryngology Research

ISSN Print: 2664-6455
ISSN Online: 2664-6463
IJOR 2024; 6(1): 06-09
www.otolaryngologyjournal.in
Received: 10-11-2023
Accepted: 18-12-2023

Dr. Ashok Vivekanand
Assistant Professor,
Department of Otolaryngology and Head and Neck Surgery,
Karuna Medical College,
Palakkad, Kerala, India

Dr. Nair Tara
Assistant Professor,
Department of Pathology,
Karuna Medical College,
Palakkad, Kerala, India

Corresponding Author:
Dr. Ashok Vivekanand
Assistant Professor,
Department of Otolaryngology and Head and Neck Surgery,
Karuna Medical College,
Palakkad, Kerala, India

Unraveling poorly differentiated and papillary thyroid carcinoma within a multinodular Goitre: A case report and review of literature

Dr. Ashok Vivekanand and Dr. Nair Tara

DOI: https://doi.org/10.33545/26646455.2024.v6.i1a.35

Abstract
The multinodular goitre of thyroid gland is not an uncommon disease condition encountered by the head and neck surgeons. Though considered as a benign entity this condition is considered to have a potential risk in the development of thyroid malignancy. The most common malignant tumors associated with multinodular goitre are of follicular cell in origin. Here we report a case of 72-year-old female patient presented with a long-standing multinodular goitre. The patient underwent total thyroidectomy and histopathological examined showed occurrence of a spectrum of follicular cell origin tumors, which were both benign and malignant. The malignant variants were papillary thyroid carcinoma and poorly differentiated carcinoma. The poorly differentiated tumor is defined by Turin consensus diagnostic criteria. The poorly differentiated variant lies in between a differentiated and anaplastic variant, where the tumor still expresses the characteristics of its cell of origin. There are various literature evidence showing synchronous occurrence of different types of thyroid malignancies. The authors would like to conclude that a thyroid nodular lesion of long duration should be managed with utmost care to provide the best available treatment to the patient.

Keywords: Multinodular goitre, papillary thyroid carcinoma, poorly differentiated thyroid carcinoma

Introduction
Multinodular goiter (MNG) is one of the most common diseases of thyroid encountered in clinical practice. It is characterized by diffuse or nodular enlargement of thyroid gland, leading to distortion of the shape. The enlargement of thyroid gland is an adaptive mechanism to compensate for the insufficient secretion of thyroid hormone. MNG can be endemic or sporadic. Iodine deficiency, the most important environmental factor and certain genetic factors influence its development. MNG has lower risk of harboring malignant changes as compared to solitary nodule of thyroid. The prevalence of thyroid malignancy in nodular goiter is 5 to 17% [1].

Papillary thyroid carcinoma (PTC), Papillary microcarcinoma (PMC), follicular thyroid carcinoma (FTC) and other well differentiated thyroid carcinomas are commonly seen associated with MNG. Few studies have also reported anaplastic carcinoma associated with multinodular goiter. Synchronous occurrence of different thyroid tumors haves also been reported in MNG. Most commonly associated tumor in synchronous malignancy in the background of MNG are PTC and follicular carcinomas [2].

Poorly differentiated thyroid carcinoma (PDC) is a malignant thyroid follicular cell neoplasm that have an intermediate behavior of that of follicular carcinomas and anaplastic carcinomas. They can arise either denovo or by dedifferentiation of papillary thyroid carcinoma. Here we report a case of synchronous occurrence of poorly differentiated thyroid carcinoma and papillary microcarcinoma in long standing MNG.

Case report
A 72-year-old female, with body mass index of 27.5 Kg/m^2 and systemic hypertension as co morbidity presented to the ENT outpatient department with history of long-standing anterior neck swelling of around 12 years duration. She was clinically euthyroid. She noticed a rapid increase in size of the swelling for 3 months which made her seek medical attention. This was associated with difficulty in swallowing and breathing.

She had difficulty in swallowing to both solids and liquids and preferred semisolid diet for the past three months. On examination of neck, a swelling of size approximately 10x10cm with irregular surface noted in the anterior aspect of the neck more on the right side extending from the level of angle of mandible superiorly to the level of suprasternal notch inferiorly and transversely from the posterior border of right stern mastoid muscle to 2 cm off midline towards left. Swelling was noted to have slight movement with deglutition. On palpation swelling had varied consistency with few areas showing firm consistency and few areas showing bony hard consistency. All borders were well defined. Clinically, trachea deviated to the left side. No cervical lymph nodes were palpable.

Videolaryngocopy showed epiglottis pushed to left obscuring the view of glottic region. Contrast enhanced computed tomography showed a large cystic lesion of size 12.2x11.3x9.5 cm in the right neck with solid component, showing heterogenous post contrast enhancement. Small cystic area with peripheral calcification was also seen. Right lobe of thyroid was not seen separately from the lesion. Another 2.6x2.5cm sized peripherally calcified cystic lesion was seen in the left lobe. Mass effect in the form of compression and displacement of trachea to left side was also seen. There was no cervical lymphadenopathy on contrast enhanced computerized tomography (CECT) of neck. Carotid arteries and left jugular vein were normal and near complete effacement of right internal jugular vein was noted (Figures 1-3).

Ultrasound guided Fine needle aspiration cytology (FNAC) of the dominant nodule was reported as hyperplastic nodule of a goitrous lesion- Bethesda category II. With the FNAC report and CECT findings, we prepared the patient for total thyroidectomy. In view of laterally displaced trachea, we anticipated a difficult airway management perioperatively. Awake fiberoptic rapid sequence intubation was attempted to secure intraoperative airway but was unsuccessful. Then we proceeded with upfront awake tracheostomy under local anesthesia and then airway was secured for intraoperative general anesthesia.

Intraoperatively the surgical neck landmarks were not easily identifiable. To provide adequate surgical exposure, right sternocleidomastoid muscle was divided and sutured back at the end of surgery. Recurrent laryngeal nerves could not be located intraoperatively (Figure 4). There were no enlarged lymph nodes. Wound was closed in layers and a 14FG size vacuum suction drain was placed inside. Patient was under observation in surgical ICU with tracheostomy in situ. Surgical drain was removed on post-operative day 3 with total 150ml of drain volume. Videolaryngoscopic examination on day 3 showed right vocal cord paresis with adequate glottic space. No signs of hypocalcemia were noted during post-operative period. Patient got discharged on post-operative day 7 after suture removal with tracheostomy tube insitu.

Histopathological examination report of the specimen showed features of poorly differentiated carcinoma in right lobe and micropapillary carcinoma in the left lobe lesion (Fig 5-8). Patient was advised to undergo radioactive iodine scan after 4-6 weeks and is on regular follow up.

Discussion

Malignant neoplasms of thyroid in the background of long-standing goitrous lesion of thyroid is not uncommon. The number of thyroid nodules within a MNG may not be a risk factor for development of carcinoma. Various studies have shown that nodules in a MNG are less likely to harbor malignant changes than solitary nodules. Risk factors contributing to oncogenesis in a MNG includes the duration of the disease, Hashimoto's thyroiditis, female gender, size of the nodule, volume of thyroid gland and younger age. Traditionally retrosternal extension of thyroid swellings tends to show more malignant changes. Interestingly, hyperthyroidism was found to have a negative association with malignancy of thyroid. This could be attributed to the low level of circulatory TSH levels [2].

Various mechanisms have been suggested in literature to explain the pathogenesis of malignant transformation in long standing goitre. These include mutations, environmental factors such as iodine deficiency, exposure to chemicals such as benzene, aromatic hydrocarbons, pesticides and obesity associated metabolic syndrome. Common mutations in long standing goitre includes RAS, PAX 8/PPAR gamma, RET/PTC, BRAF and TERT promoter mutations. All of these are proven mutational genes in the development of PTC. This explains the increased incidence of PTC in MNG [3].

There is a proven association of obesity and insulin resistance with the development of follicular cell origin malignancy in goitre. The spectrum of metabolic syndrome has shown to produce a proinflammatory environment which favors development of several mutations. One among the several mutations in the hyper insulinemic state is activation of IGFR and subsequent MAP kinase pathway with subsequent development of differentiated thyroid neoplasms [4].

Among the thyroid cancers, the most common to occur in an unattended goitre for a long duration is papillary thyroid carcinoma followed by other well differentiated thyroid tumors. There are studies reporting the occurrence of two malignancies in thyroid gland. PTC-Medullary thyroid carcinoma (MTC), PTC-Follicular carcinoma, Follicular carcinoma- medullary are more commonly found in combination. PTC and anaplastic carcinoma in combination have also been reported in goitre. Dikbas *et al*. has reported a case with MTC and PTC as collision tumor [5]. Samarasingha *et al*. also reported an intermixed MTC and PTC in a patient with renal cell carcinoma who also had a family history of breast carcinoma [6]. A case with synchronous PTC and FTC was reported by Feng *et al*. [7]. Cupisiti *et al*. presence of three tumors in long standing goitre-PTC, FTC and MTC [8]. Here authors report a case showing the synchronous occurrence of PDC and papillary microcarcinoma.

The papillary microcarcinoma is defined as papillary thyroid carcinoma of less than or equal to 10mm in diameter. Though the prognosis is good, it should not go unnoticed. Especially in cases of multinodular goitre, it is important to thoroughly evaluate every nodule clinically, radiologically, and histopathologically so as to not miss this diagnosis. In our patient the relatively normal looking left lobe had a focus of PMC. Though the prognosis is favorable, and they are considered to be indolent malignancy, there is a remote chance of lymph nodal metastases, local recurrence, or distant metastasis [9].

Poorly differentiated carcinoma of thyroid is a relatively rare follicular cell origin neoplasm. PDC can be considered as a tumor in between the spectrum of tumors from well differentiated to anaplastic. The two criteria used in defining PDC are Turin proposal and MKSCC criteria. Turin proposal defined PDC as a tumor of follicular cell type with presence of solid or insular or tubular (SIT) pattern of growth, with absence of conventional nuclear features of PTC and presence of at least one among the following features: convoluted nuclei, mitotic activity more than or equal to 3 in 10 high power fields and tumor necrosis [10].

The possible factors contributing to the occurrence of PMC and PDC in this patient can be older age, female gender, long standing nature of the disease and also, both the conditions have common cell of origin i.e., thyroid follicular cells.

Authors would like to emphasize the importance of early intervention in cases of longstanding goitre with clinical history suggestive of malignant transformation. This case also shows the limitation of FNAC where if the lesion is not sampled from the representative area, can lead to false negative diagnosis. Therefore, due diligence should be taken in evaluation such cases.

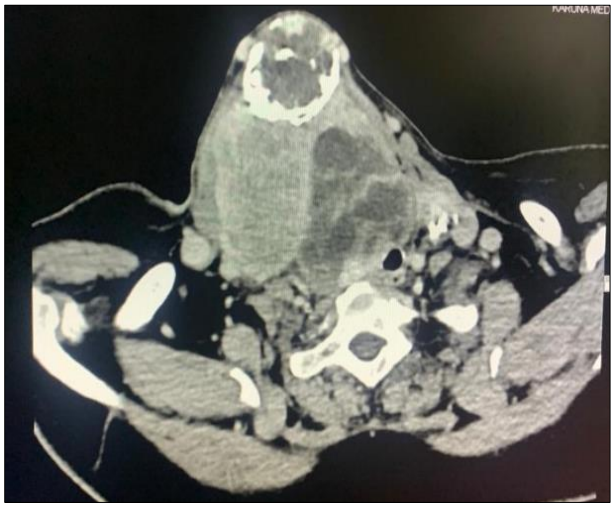

Fig 1: CECT Neck axial section showing 2.6x2.5 cm sized peripherally calcified cystic lesion in left lobe of thyroid

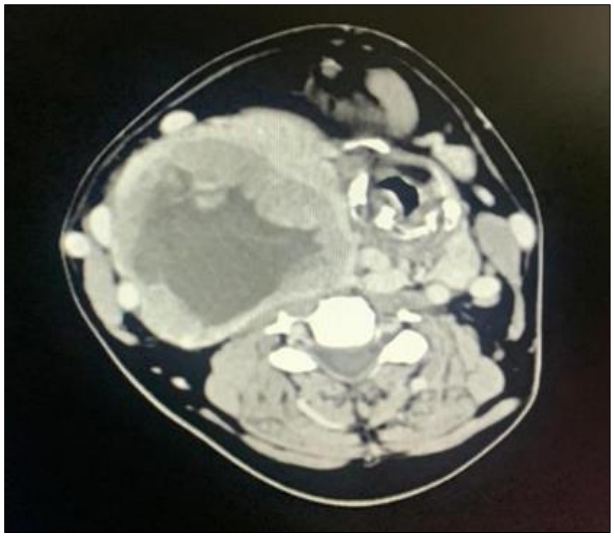

Fig 2: CECT Neck axial section showing large cystic lesion in the right side of neck of size 12.2x11.3 cm with heterogeneous post contrast enhancement, peripheral calcification, and displacement of trachea to left

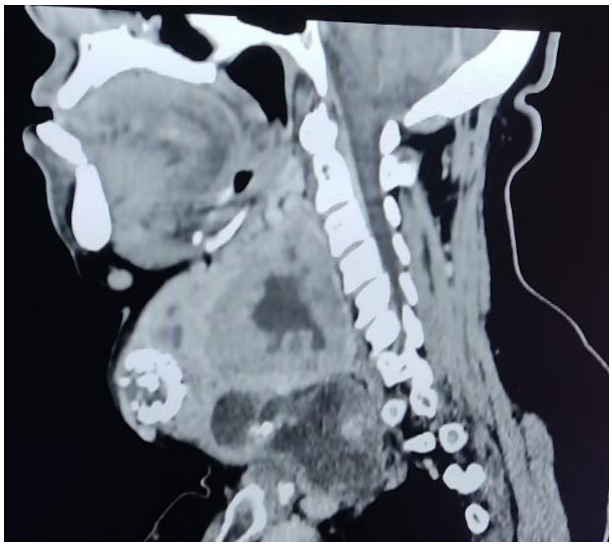

Fig 3: CECT Neck coronal section showing mass effect in the form of compression of airway.

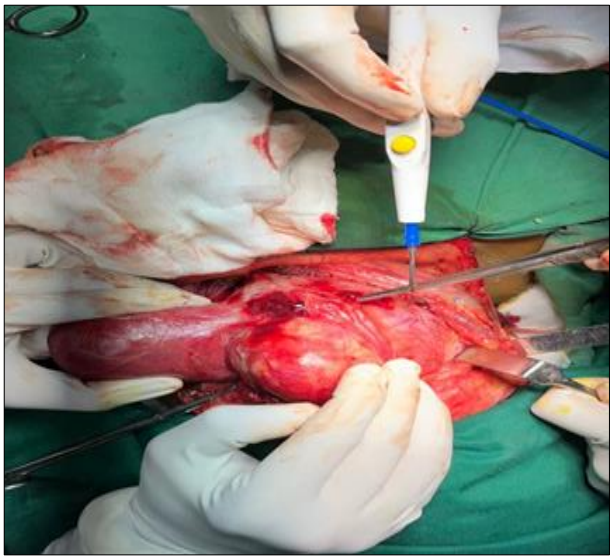

Fig 4: Intra operative image showing multiple thyroid nodules with no proper surgical landmarks.

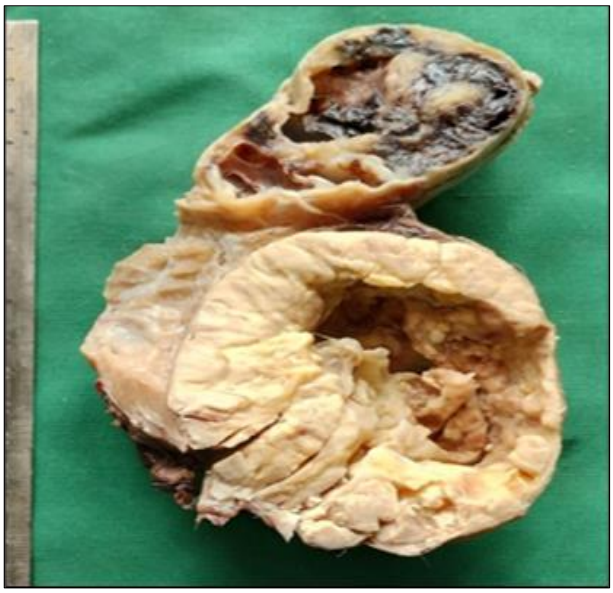

Fig 5: Gross cut specimen of thyroid showing large pale greyish white nodule with areas of necrosis

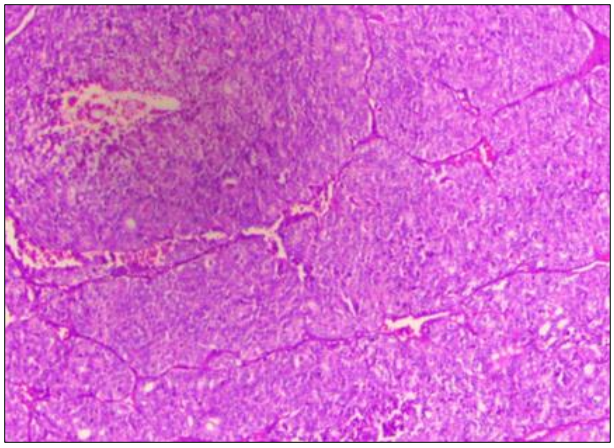

Fig 6: 40x magnification image showing poorly differentiated thyroid carcinoma with insular pattern

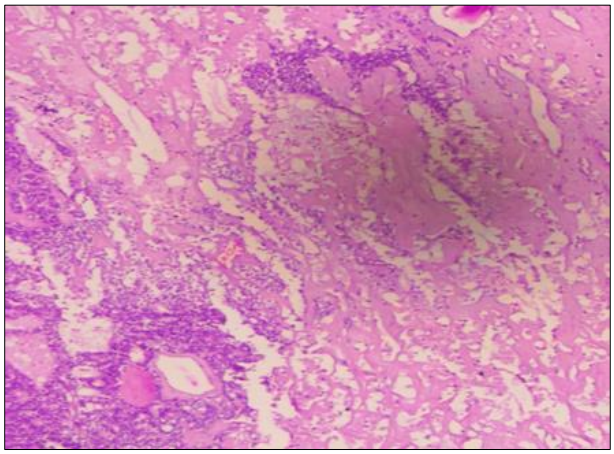

Fig 7: 40x magnification image showing necrosis in poorly differentiated thyroid carcinoma

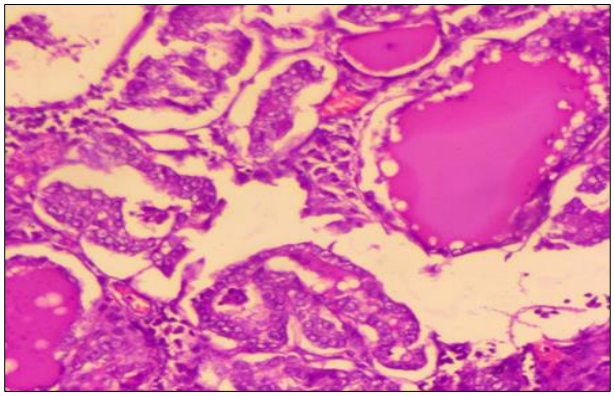

Fig 8: 40x magnification image showing papillary thyroid carcinoma features

Conclusion

Multinodular goitre is one of the most common thyroid diseases. While benign, long standing multinodular goitre can harbor malignancy. Preoperative diagnosis of malignancy in large masses can be sometimes challenging. A multidisciplinary team approach is imperative for optimal management.

References

1. Fernandes GA, Matos LL, Dedivitis RA. Risk Factors for Malignancy in Patients with Multinodular Goitre. Int. Arch Otorhinolaryngol. 2022 Jun 17;27(1):e138-e142.
2. Ajarma KY, Al-Faouri AF, Al Ruhaibeh MK. The risk of thyroid carcinoma in multinodular goitre compared to solitary thyroid nodules: A retrospective analysis of 600 patients. Med J Armed Forces India. 2020;76(01):23-29.
3. IYFactors S, Cetinkalp S, Kabalak T. Review of factors contributing to nodular goitre and thyroid carcinoma. Med Princ Pract. 2020;29(1):1-5.
4. Franchini F, Palatucci G, Colao A, Ungaro P, Machia PE, Nettore IC, et al. Obesity and Thyroid cancer risk; An update. Int. J Environ Res Public Health. 2022 Jan;19(3):1116.
5. Dikbas O, Duman AA, Guvendi GF. Medullary thyroid carcinoma and Papillary Thyroid Carcinoma in the same patient as a collision tumour. Case Reports in Endocrinology; c2019. ID: 4038628.
6. Samarasinghe S, Yuksel S, Mehrotra S. Intermixed medullary and papillary thyroid cancer in a patient with renal cell carcinoma. Endocrinol Diabetes Metab Case Rep; c2020. p. 20-25.
7. Feng JW, Ye J, Hu J, Liu SY, Jiang Y, Hong LZ, et al. Synchronous papillary thyroid carcinoma and follicular thyroid carcinoma; case report and review of literature. Int. J Clin. Exp. Pathol. 2020;13(11):2767-2771.
8. Cupisti K, Raffel A, Ramp U, Wolf A, Donner A, Krausch M, *et al*. Synchronous Occurrence of a Follicular, Papillary and Medullary Thyroid Carcinoma in a Recurrent Goitre. Endocrine Journal. 2005;52:281-285.
9. Elvin A, Gonzalez L, Maria J, Maria SA, Ihab AN, Magali P, *et al*. Thyroid Papillary Micro Tumor Validation of the (Updated) Porto Proposal Assessing Sex Hormone Receptor Expression and Mutational BRAF Gene Status. The American Journal of Surgical Pathology. 2020;44(9):1161-1172.
10. Tong J, Ruan M, Jin Y, Fu H, Cheng L, Luo Q, *et al*. Poorly differentiated thyroid carcinoma: A clinician's perspective. Eur. Thyroid J. 2022;11(2):e220021.

How to Cite This Article
Vivekanand A, Tara N. Unraveling poorly differentiated and papillary thyroid carcinoma within a multinodular Goitre: A case report and review of literature. International Journal of Otolaryngology Research. 2024;6(1):06-09.