

## Age and Papillary Thyroid Cancer; A Perspective with Case Report

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### Authors' contributions

This work was carried out in collaboration between both authors. Author MSS designed the study, wrote the protocol, and wrote the first draft of the manuscript. Author ABZ managed the analyses of the study and the literature searches. Both authors read and approved the final manuscript.

### Article Information

#### Editor(s):

(1) Dr. Hab. Mariusz Cycon, Medical University of Silesia, Poland.

#### Reviewers:

(1) Atif Sitwat Hayat, Suleman Roshan Medical College, Pakistan.

(2) Tjahjodjati, Universitas Padjadjaran & Hasan Sadikin General Hospital, Indonesia.

Complete Peer review History: <http://www.sdiarticle4.com/review-history/65198>

Received 20 November 2020

Accepted 24 January 2021

Published 12 February 2021

Case Report

### ABSTRACT

**Background:** Papillary Thyroid Cancer (PTC), is a common encountered head and neck cancers, making the majority of cases among thyroid malignancies. It is unique since thyroid cancers are the only cancer that include age to predict the prognosis. The usage of age however is debatable albeit being still widely used in various staging systems.

**Case Presentation:** We report a case of a young 41years gentleman with aggressive features of PTC, presented with worsening progressive breathlessness. Clinically diffuse palpable right anterior neck swelling was noted upon examination.

CT neck showed that the mass arising from right inferior lobe of thyroid gland with regional lymphadenopathy and retrosternal extension. Total thyroidectomy and neck dissections and tracheostomy was performed, complicated with intraoperative iatrogenic injury to the subclavian vessel due to the aggressiveness of the tumour, which was ultimately secured by the assist from vascular surgeon.

**Conclusions:** Adopting age as a sole factor is not sufficient for preliminary prognosis and outcome for the patients.

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**Objective:** To share our experience in managing a case of an aggressive Papillary Thyroid Cancer in a young 42-year-old patient.

**Article Design and Setting:** Case Report & Tertiary General Medical Centre.

*Keywords: Papillary; PTC; thyroid; subclavian.*

## ABBREVIATIONS

AJCC	: TNM/TNM- American Joint Committee on Cancer Tumour-Node-Metastasis
AMES	: Age, distant Metastases, Extra-thyroidal Invasion, Size
CIH	: Cancer Institute Hospital in Tokyo
CT	: Computed Tomography
DAMES	: DNA, Age, Metastases, Extent, Size
FNAC	: Fine Needle Aspiration Cytology
GAME	: Grade, Age, Metastases, Extent, Size
iStage	: intraoperative Staging
MACIS	: Metastases, Age, Completeness of Resection, Invasion, Size
OSU	: Ohio State University system
PTC	: Papillary Thyroid Cancer
SAG	: Sex, Age, Grade

## 1. INTRODUCTION

For thyroid cancers, various age had been proposed to be the cut of point in differentiating between young and elderly, with '45' is the age in which those who are lesser are considered young with favourable prognosis in contrast to those who are beyond it [1,2]. This is accordance to 7<sup>th</sup> edition of American Joint Committee on Cancer Tumour-Node-Metastasis (AJCC-TNM/TNM) staging system, however the actual reason is still unknown [1]. There are also other staging system using different age for prognosticating the disease [2,3]. Aside age, there are other factors that can prognosticate

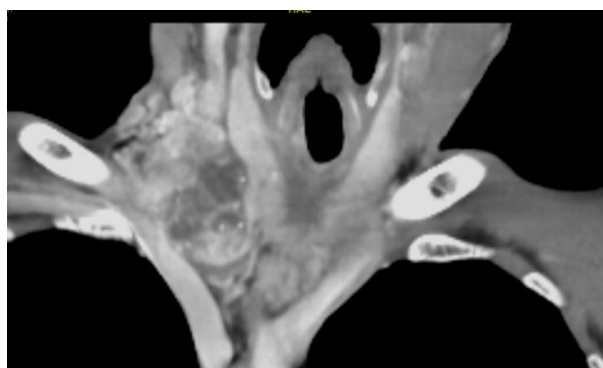
PTC. Hence, the significance of prognosing thyroid cancers solely with age is still debatable.

## 2. METHODS

Patient recruitment from a tertiary medical centre. Progress of the recruited patient was followed, beginning from clinical assessment upon presentation, progress, laboratory and radiological investigations, surgical intervention and clinic follow up session.

## 3. CASE PRESENTATION

41-year-old gentleman with no medical illness brought to Casualty Department with progressive breathlessness for 2 months worsening in a week. Past medical and family history were unremarkable. An enlarged diffused right sided anterior neck swelling lateral to thyroid cartilage was noted extending to suprasternal notch which cannot get below it. ENT scope was otherwise normal. CT scan showed the tumour epicentrically from right inferior thyroid gland with retrosternal and mediastinal extension. Multiple enlarged right cervical lymph nodes at level III, IV and VI, largest 4x3cm, compressing the right internal jugular vein and subclavian vessels. The tracheal ring within superior mediastinum was compressed causing narrowing of the lumen. (Figs. 1, 2) Thyroid function test was normal and urgent FNAC was done, which came back as PTC.



**Fig. 1. Shows coronal section of tumour arising from the right inferior thyroid gland and cervical metastases with narrowest point of tracheal lumen at T1-T2 level, measuring 5mm**



**Fig. 2. Shows sagittal section of CT of tumour with retrosternal and superior mediastinal extension**

He underwent total thyroidectomy, right selective neck dissection and tracheostomy under general anaesthesia. Multiple aggressive-looking blackish tumours were seen originated from the right lower lobe and thyroid isthmus with regional nodal metastases. The left thyroid otherwise appeared normal. Surrounding soft tissues were bizarrely adhered with no clear plane in between them. Right internal jugular vein and right subclavian vessels were almost collapsed and plastered in between the tumours. The right recurrent laryngeal nerve was unable to be identified. Minimal infringement of the tumour on the thyroid cartilage and tracheal rings was noted yet the endoluminal mucosa showed no evidence of invasion (Figs. 3, 4).

Midway during dissecting the inferior margin, the right thyrocervical trunk of the subclavian artery was iatrogenically injured causing massive haemorrhage, after multiple attempts of identifying and ligating the injured vessel failed. Haemostasis was finally achieved by securing the vessel with the assist from fellow vascular surgeons whom being referred intraoperatively, whereby they managed to identify and repair the injured vessel. The haemodynamic status of the patient was successfully restored after appropriate resuscitative measures was taken by the anaesthetist.

Post operatively, the patient was monitored intensively yet developed hypocalcaemia, manifested with perioral and peripheral limbs

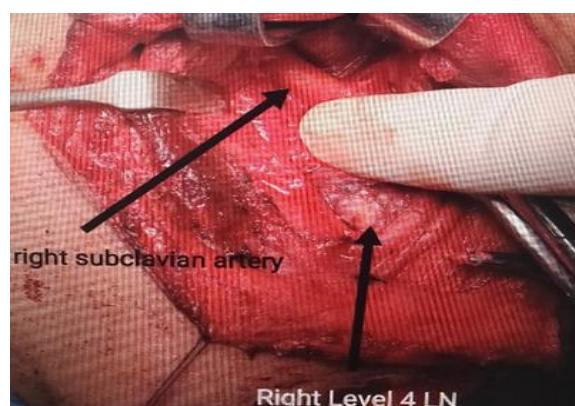
numbness and was referred to endocrinologist for appropriate management. He was allowed home day-7 postoperatively with analgesics, thyroxine and calcium supplements. On subsequent visit, histopathological report confirmed the diagnosis of PTC and was referred for radioactive iodine treatment for complete clearance. Subsequent clinic visit showed positive improvement in patient's general condition and tracheostomy was planned to be weaned off once vocal cords functions are fully restored.

#### **4. DISCUSSION**

PTC originated from the parenchymal thyroid tissue, specifically the thyroid follicular cells and is the commonest endocrine malignancy accounting as high as 85-90% of all thyroid cancers [4,5,6]. Age of onset follows the bell-shaped distribution, with highest incidence from second to fourth decades of life [6]. Rising incidence in recent years advocated to the advance medical technologies and vast screening programme [5,6]. Few cases of aggressive PTC have been reported in young. Gayathri et al reported case of PTC with extracapsular, extra-thyroidal spread and regional nodal spread in a 5year boy [7]. Park et al. reported recurrent PTC with anaplastic transformation in a 31 year patient [8]. These are two examples out of many proving that age alone is not enough to prognosticate PTC.



**Fig. 3. Shows tracheal invasion by the tumour**



**Fig. 4. Shows intraoperative surgical field with right subclavian artery and level IV lymph nodes**

Various systems are using different cut off age, such as MACIS (Metastases, Age, Completeness of Resection, Invasion, Size) at 40 years, CIH (Cancer Institute Hospital in Tokyo) at 50 years, AMES (Age, distant Metastases, Extra-thyroidal Invasion, Size) at 41 years for male and 51 years for female, iStage (intraoperative Staging) at 55 years [4,3,9]. Other systems include DAMES, GAMES, SAG, OSU and the list continue to a total of 18 in number that have been published [4,3,9,10]. Nonetheless, the AJCC-TNM is still the preferred owing to simpleness, straightforward, uncomplicated and vastly used in other cancers [10,11].

Other factors that prognosticate PTC are size and grade of the primary tumour, presence of extracapsular and extra-thyroidal invasion, regional lymphadenopathy, distant spread and completeness of intraoperative resection [2,3,10]. These features can be extracted from thorough clinical examinations, adequate radiological

assessment and surgeon's experiences. Whereas, paediatric PTC is catastrophic with higher incidence recurrence, regional nodal spread, and lung metastases [7]. Anaplastic transformation of PTC though is more common in elderly, few cases lesser than 30 years were reported [8]. While being considered rare and idiopathic, it has more than 90% mortality rate with survival duration of only 4-12 months after initially diagnosed [8].

## 5. CONCLUSION

Albeit 'Age' has been included in prognosticating thyroid malignancies with various systems being created and used, it might not reflect the actual condition suffered by the patient. Hence it cannot stand on its own for prognosis without considering other factors which have been discussed earlier. Therefore, we suggest that the usage of age should be further revised.

## CONSENT AND ETHICAL APPROVAL

Consent for participation and publication were taken from the patients according to local ethical guidelines on accordance to Declaration of Helsinki.

## ACKNOWLEDGEMENT

Special acknowledgement to the ORL-HNS Department University of Malaya for supporting the production of this article.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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Peer-review history:

The peer review history for this paper can be accessed here:  
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