

EMERGENCY THYROIDECTOMY FOR ACUTE RESPIRATORY DISTRESS IN A PATIENT WITH ANAPLASTIC THYROID CARCINOMA: A CASE REPORT AND REVIEW OF THE LITERATURE

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ABSTRACT

Anaplastic thyroid carcinoma (ATC) is the most aggressive form of thyroid cancer. It is characterized by rapid growth, extensive loco-regional spread and early distant metastasis resulting in a poor prognosis. The presentation can be varied, but most patients present with a rapidly enlarging neck mass with associated symptoms of compression such as dysphagia or stridor. ATC can arise denovo, however, many arise from pre-existing thyroid cancers. There are cases where ATC arose from multinodular goitres. We report a case of a 54 year old female with a long standing MNG who presents with a rapidly enlarging neck mass and acute respiratory failure who underwent an emergency thyroidectomy.

Keywords: emergency thyroidectomy, thyroid related respiratory failure, anaplastic thyroid carcinoma, multinodular goitre

INTRODUCTION

Anaplastic thyroid carcinoma is one of the most feared cancer diagnoses a clinician can make. It is a very aggressive disease and is characterized by extensive loco-regional spread and early distant metastasis. Anaplastic thyroid carcinoma has also been reported to arise from other thyroid cancers and multi-nodular goitres [1, 2]. The most common complication of anaplastic carcinomas are as a result of compression of surrounding structures, in extreme cases, thyroid related respiratory failure may occur and require an emergency thyroidectomy as a lifesaving procedure.

We present a case of a neglected multi-nodular goitre with anaplastic transformation in a 54 year old female who presented with acute respiratory distress.

CASE DESCRIPTION

A 54 year old female presented to the emergency department with shortness of breath. She is a known hypertensive with a multi-nodular goitre being seen as an outpatient in the otolaryngology clinic. This patient had a bilateral neck swelling for the past 10 years that slowly increased in size. Ultrasound scans

showed a bilateral multi-nodular goitre with cystic degeneration and multiple FNA of nodules were inconclusive (epithelial cells, incomplete cytology, suggest open biopsy). This patient was of sound mind and offered thyroidectomy which she refused multiple times.

She presented to the emergency service with rapid enlargement of the neck mass over the past 3 weeks with the development of dysphagia and dyspnoea within the preceding 3 days. On examination an elderly female was noted to have a large goitre with the inferior aspect extending retro-sternally with an associated large right sided mass (Figure 1). Initially she was in no obvious respiratory distress and was sent for a chest X-ray (Figure 2), however, she started to complain of sudden onset difficulty breathing shortly thereafter. Her O₂ saturations was falling on room air, the patient was then intubated and stabilized. She was then sent for a CT scan which revealed a multi-nodular goitre with compression of the trachea right common carotid

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artery and internal jugular vein (Figure 3, 4).



Figure 1: Showing large thyroid mass

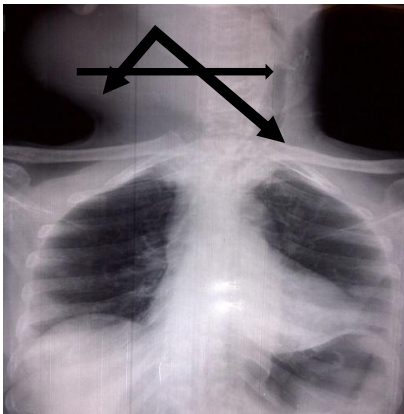


Figure 2: Chest X-ray showing left sided tracheal deviation and neck mass.



Figure 3: CT scan showing large mass causing compression and deviation of trachea with endotracheal tube in-situ

The patient was then booked for an emergency thyroidectomy with ligation of the right internal jugular vein and tracheostomy. Laboratory investigations showed mild hypothyroidism.

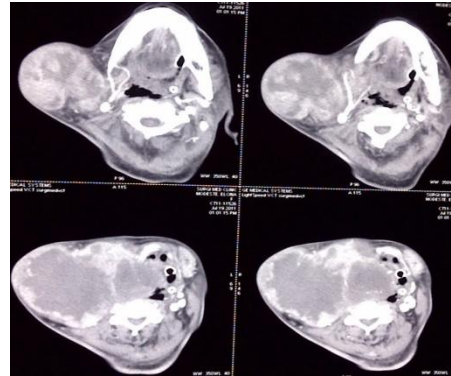


Figure 4: CT scan showing large heterogeneous mass in the neck

Intraoperative findings included (Figure 5) significant enlargement of both lobes of the thyroid gland with the right lobe greater in size compared to the left. There were many sub-centimetre nodules noted throughout both lobes of the thyroid gland. The right sided thyroid mass completely encased the right internal jugular vein with tumour invading the lumen (Figure 6). There was also approximately 50% encasement of the right common carotid artery with the mass densely adherent to the anterior wall of the trachea.

Post operatively the patient was transferred to the Intensive care unit where she was discharged to the ENT ward 10 days post-operation. Unfortunately the patient expired 4 months post operation.

Histopathological examination of the specimen revealed anaplastic carcinoma of the thyroid gland (Figure 7).

DISCUSSION

Anaplastic thyroid carcinoma (ATC) is a rare, aggressive form of thyroid cancer arising from follicular thyroid cells. The aggressive nature of this tumour is attributed to its rapid growth, extensive loco-regional spread and early distant metastasis which results in a very poor, invariably fatal prognosis. According to an analysis of the Surveillance, Epidemiology and End Result (SEER) database, the incidence of ATC is approximated to be 1 to 2 cases per million per population per year[3]. ATC tend to occur around the 6-7th decade of life with a female preponderance of 70% [4]. ATC

can arise de novo, however, many arise from pre-existing thyroid cancers, especially the follicular subtype [5]. There are cases where ATC arose from multi-nodular goitres [6].

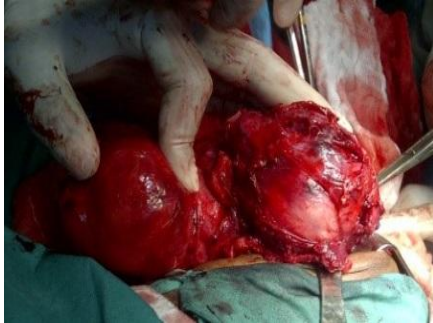


Figure 5: Intraoperative picture of large multi-nodular goitre

The presentation of patients with ATC is varied, however patients most commonly complain of a rapidly enlarging neck mass (77 %) along with symptoms resulting from compression of regional structures such as dysphagia (40%), voice change (40%) and stridor (24%) [7]. Our patient presented with a rapidly enlarging neck mass with associated dysphagia and dyspnoea.

The diagnosis of ATC is via examination of cells obtained via FNA, if indeterminate, then tissue is required either by large needle or surgical biopsy, both of which were refused by our patient despite adequate counselling. It is likely possible, our patient had an undiagnosed thyroid cancer which underwent transformation to ATC. It is also within the realm of possibility that this case represents a malignant transformation of a multi-nodular goitre to ATC. A diagnosis of ATC equates to Stage IV disease with intra-thyroidal being designated as IV A, extra-thyroidal extension IV B and distant metastasis IV C. Our patient was likely a Stage IV B.

The treatment of ATC is not standardized as it is unclear current therapy is effective [8]. For patients with intra-thyroidal disease, complete resection followed by adjuvant chemo-radiotherapy is recommended. In patients with extra-thyroidal extension or with distant metastasis no effective therapy is available therefore, prognosis is bleak and surgical intervention is reserved for palliation or emergency situations as in this case [8].

Goitres are a rare cause of upper airway obstruction. Regardless of the cause it represents an emergency and securing the airway is of utmost

importance. In this case, the airway was secured via classical endotracheal intubation. On review of the literature, however, it is recommended in these cases, intubation should be performed by awake

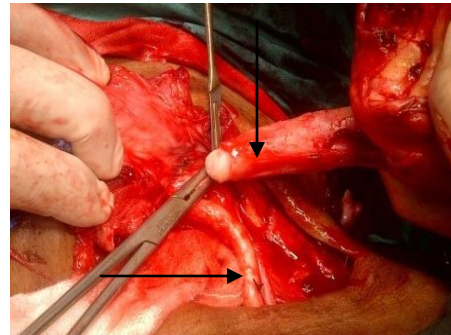


Figure 6: Down arrow showing the lesion extruding through the right internal jugular vein and transverse arrow indicating right common carotid artery

fibre-optic intubation as loss of consciousness can result in complete airway obstruction due to loss of muscle tone [9, 10]. Tracheostomy is another method of securing the airway but it should not be employed in cases of thyroid related respiratory failure. This is due to the large goitre obliterating landmarks and there is risk of significant bleeding [11]. It is therefore recommended after thyroidectomy.

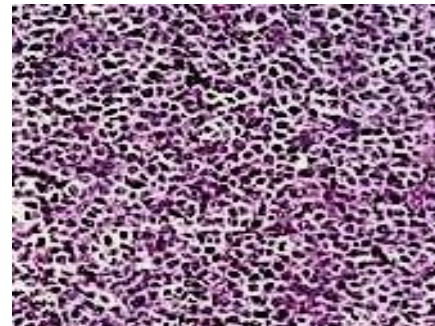


Figure 7: Microscopic view of anaplastic thyroid cancer

Emergency thyroidectomies are not common place and are performed usually due to airway obstruction or in one reported case of external haemorrhage [12]. Emergency thyroidectomies for airway obstruction can be found in the literature dating back to 1821 where the Dresden surgeon Johann August Wilhelm Hedenus operated on 6 patients with upper airway obstruction secondary to large goitres [13]. Emergency thyroidectomies are

not without their shortcomings as they are associated with a higher complication rate.

The overall prognosis for ATC is poor with median survival approximated to be 5 months and 1 year survival is estimated to be 20% [14]. Death is usually secondary to upper airway obstruction in about 60 % of patients even in the presence of a tracheostomy, the remainder succumb to a combination of complications from loco regional disease and distant metastasis [15, 16].

CONCLUSION

Thyroid related respiratory failure is a well-recognized clinical entity. In such cases ATC should be considered high in the differential. The outlook for patients diagnosed with ATC is bleak and more research is needed to obtain a form of treatment both to prolong survival and to improve quality of life.

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Informed consent was obtained for the patient's next of kin to publish this case.

REFERENCES

1. Venkatesh YS, Ordonez NG, Schultz PN, et al. Anaplastic carcinoma of the thyroid. A clinicopathologic study of 121 cases. *Cancer* 1990; 66:321.
2. Carcangiu ML, Steeper T, Zampi G, Rosai J. Anaplastic thyroid carcinoma. A study of 70 cases. *Am J Clin Pathol* 1985; 83:135.
3. L. Davies and H. G. Welch, "Increasing incidence of thyroid cancer in the United States, 1973–2002," *Journal of the American Medical Association*, vol. 295, no. 18, pp. 2164–2167, 2006
4. Nagaiah G, Hossain A, Mooney CJ, et al. Anaplastic thyroid cancer: a review of epidemiology, pathogenesis, and treatment. *J Oncol* 2011; 2011:542358.
5. Chiacchio, S., Lorenzoni, A., Boni, G., Rubello, D., Elisei, R., Mariani, G. Anaplastic thyroid cancer: prevalence, diagnosis and treatment. *Minerva Endocrinol.* 2008; 33:341–357.
6. Maatouk J, Barklow TA, Zakaria W, Al-Abbadi MA. Anaplastic thyroid carcinoma arising in long-standing multinodular goiter following radioactive iodine therapy: report of a case diagnosed by fine needle aspiration. *Acta Cytology.* 2009 Sep-Oct;53(5):581-3.
7. S. A. Hundahl, I. D. Fleming, A. M. Fremgen, and H. R. Menck, "A National Cancer Data Base report on 53,856 cases of thyroid carcinoma treated in the U.S., 1985–1995," *Cancer*, vol. 83, no. 12, pp. 2638–2648, 1998.
8. Smallridge RC, Ain KB, Asa SL, et al. American Thyroid Association guidelines for management of patients with anaplastic thyroid cancer. *Thyroid* 2012; 22:1104.
9. M. Testini, F. Lagoluso, G. Lissidini, A. Gurrado, G. Campobasso, R. Cortese, et al. Emergency total thyroidectomy due to non-traumatic disease. Experience of a surgical unit and literature review. *World J Emerg Surg*, 7 (2012), p. 9
10. Northrip DR, Bohman BK, Tsueda K. Total airway occlusion and superior vena cava syndrome in a child with an anterior mediastinal tumour. *Anaesthesia and Analgesia.* 1986; 65:1079-1082.
11. Ayaba H, Kawahara K, Tagawa Y, et al. Upper airway obstruction from a benign goitre. *Japanese Journal of Surgery.* 1992; 23:88-90.
12. Kumar S, Joshi MK. Emergency total thyroidectomy for bleeding anaplastic thyroid carcinoma: a viable option for palliation. *Indian Journal of Palliative Care.* 2011; 17(1):67–69.
13. Heidel G, Wundrich B, Dehne A (1986) Our surgical heritage. The Dresden surgeon Johann August Wilhelm Hedenus (1760-1836). *Zentralbl Chir* 111:1551-1558.
14. Smallridge RC, Copland JA. Anaplastic thyroid carcinoma: pathogenesis and emerging therapies. *Clin Oncol (R Coll Radiol)* 2010; 22:486.
15. Tallroth E, Wallin G, Lundell G, et al. Multimodality treatment in anaplastic giant cell thyroid carcinoma. *Cancer* 1987; 60:1428.
16. Tan RK, Finley RK 3rd, Driscoll D, et al. Anaplastic carcinoma of the thyroid: a 24-year experience. *Head Neck* 1995; 17:41.