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Thyroid Malignancy: 5 years' Experience

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ABSTRACT

Objective — *To find out the frequency of various types thyroid carcinomas and their management in a tertiary care hospital of Karachi.*

Study design — *Descriptive case series.*

Place & Duration of study — *Department of General Surgery, Jinnah Postgraduate Medical Centre, Karachi, from June 2014 to May 2019.*

Methodology — *All patients with well differentiated thyroid carcinoma and medullary thyroid carcinoma were included in the study. Patients with anaplastic carcinoma were excluded. Written and informed consent were taken from the patients and data was recorded on a pre-designed form.*

Results — *Two hundred and thirty-eight patients were included in this study. One-fifty-eight patients were female and eighty male with female to male ratio of 2:1. Papillary carcinoma was found to be the most frequent thyroid carcinoma encountered (n=188 - 79.41%) followed by follicular and medullary carcinoma, 26 (10.50%) and 24 (10.08%) respectively. Various surgical procedures were done to deal with these malignancies, that included completion thyroidectomy (n=138 - 57.9%), completion thyroidectomy with modified radical neck dissection (n=10 - 4.20%), total thyroidectomy (n=31 - 13.02%), total thyroidectomy plus modified radical neck dissection (n=47 - 19.74%) and modified radical neck dissection (MRND) alone in 12 (5.04%) patients.*

Conclusions — *Papillary carcinoma was the most common thyroid malignancy encountered. Frequency of medullary carcinoma was found almost equal to the follicular carcinoma.*

Key words — *Thyroid carcinoma, Papillary thyroid carcinoma, Follicular thyroid carcinoma, Thyroidectomy, Modified radical neck dissection.*

INTRODUCTION:

Thyroid carcinoma is the most common endocrine cancer accounting for 92% of cancers of endocrine glands. The incidence of well differentiated thyroid carcinoma(WDTC) has increased dramatically over the last 20 years.[1] Papillary thyroid cancer (85%) is the most common type.[2] Most common presentation is with solitary thyroid nodule.[3] It may present as multinodular goitre (MNG), enlarged thyroid gland with cervical lymphadenopathy and in extreme cases fungating mass with bleeding. Fine needle aspiration cytology of solitary thyroid nodule is an important investigation to exclude malignant conditions but its role in MNG is often limited as the identification of suspicious nodule is highly operator dependent. If cervical lymphadenopathy is clinically appreciated, few surgeons prefer to go for excisional biopsy for histopathological diagnosis even after positive findings on FNAC, but on the other hand some surgeons discourage this practise as the procedure of excisional

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biopsy itself distorts the tissue planes and later on causes difficulty in exploring that compartment if neck dissection is to be done. The aim of this study was to identify the frequency of various thyroid carcinomas, their clinical presentation and management, so that a protocol may be proposed based upon evidence based data.

METHODOLOGY:

This was a descriptive case series conducted in General Surgery Department Ward 25, Jinnah Postgraduate Medical Centre Karachi, from June 2014 to May 2019. Patients with the diagnosis of well differentiated thyroid carcinoma and medullary carcinoma were included in the study while those who were diagnosed as anaplastic carcinoma were excluded. The data was recorded on a pre-designed form. Written and informed consent were taken.

All patients with thyroid diseases were carefully examined and subjected to different radiological and histological investigations. Ultrasound neck was done in every patient with enlarged thyroid gland. FNAC was done for suspicious lesion. CT scan neck was done to find out retrosternal extension of thyroid, cervical lymph node status, relation of tumor with carotid vessels, and tracheal or oesophageal invasion. In those patients who were referred from other hospitals for completion thyroidectomy were subjected to CT-scan neck to find out any residual thyroid tissue on the ipsilateral side or associated impalpable cervical lymphadenopathy. Trucut biopsy was only done in patients with suspicion of anaplastic carcinoma or thyroid lymphoma. If cervical lymph nodes were palpable, either FNAC or excisional biopsy was done for histopathological diagnosis. All patients also underwent direct laryngoscopy to assess the vocal cords movement prior to surgery.

The diagnosis of thyroid carcinoma was made on the findings of FNAC or histopathology, either done by excisional biopsy of cervical lymph node or documentation of malignancy in the histopathology of thyroid tissue in the patients who underwent lobectomy for solitary thyroid nodule. The extent of surgical resection was planned according to individual patient condition. Preoperative counselling was done about surgical plan and its outcome. Drain placement was usually done in those patients who underwent neck dissection or in total thyroidectomy cases only. It was also placed where huge thyroid gland was removed or if there were concerns about bleeding. In postoperative period each patient was checked for the signs and symptoms of hypocalcaemia on 2 hourly basis and serum calcium levels were sent when it was suspected. I/V calcium replacement was done if hypocalcemia was noted. In other patients serum calcium levels were sent on the first postoperative day and then on follow-up after 2 weeks in the clinic. According to histopathology reports further treatment was planned in consultation with oncologists. When needed patients were referred for radio-active iodine ablation.

RESULTS:

Two hundred and thirty-eight patients were included in this study. Out of this 158 were female and 80 were male with female to male ratio of 2:1. Papillary carcinoma was the most frequent thyroid carcinoma encountered (n=188 - 79.41%) followed by follicular and medullary carcinoma. Papillary and follicular carcinomas were found more commonly in females (73.3% and 64% respectively) with the female to male ratio of 2.3:1 and 1.7:1 respectively. On the other hand patients diagnosed as medullary thyroid carcinoma were mostly (62.5%) males with male to female ratio of 1.6:1.

Completion thyroidectomy (n=138 - 57.9%) was the most common surgical procedure performed (table I). Two recent patients were diagnosed as locally advanced papillary carcinoma, one of whom underwent total thyroidectomy with right MRND and excision of medial end of right clavicle, and in other patient debulking surgery was performed as tumour was invading the cervical vertebra and also involving the vital structures in the neck. In three patients with medullary thyroid carcinoma, the recurrent laryngeal nerve (RLN) was deliberately divided as tumour was involving the RLN and surgical resection was the only appropriate treatment.

Three patients underwent RLN anastomosis with ipsilateral ansa cervicalis, out of three, one patient had almost full recovery of voice after 6 months. . Various complications that occurred in this series are given in table I.

DISCUSSION:

In the well differentiated thyroid carcinoma, the extent of surgical management has always been a topic of discussion. United Kingdom National Multidisciplinary Guidelines recommend unilateral thyroid lobectomy for thy-3 and thy-4 lesions. Moreover, few important features necessitate total thyroidectomy including; tumour size of greater than 4 cm, multifocal disease, bilateral disease, clinical or radiological lymph nodes involvement and distant metastasis.[3] Total thyroidectomy for WDTC has several advantages: first, total excision of the thyroid gland helps in the detection, and ablation of metastatic disease with radioactive iodine. Second, the sensitivity of thyroglobulin seems to be increased for the detection of recurrent disease when nearly

Table I: Complications in Thyroid Surgery

Complications	Total Thyroidectomy n= 31	Total Thyroidectomy + MRND n= 47	Completion Thyroidectomy n= 138	Completion Thyroidectomy + MRND n= 10	MRND n= 12	Total %
Transient Hypocalcaemia	3 (1.26%)	4 (1.68%)	5 (2.1%)	2 (0.84%)	3 (1.26%)	7.1%
Permanent Hypocalcaemia	0%	0%	0%	0%	0%	0%
Temporary Voice changes	0%	2 (0.84%)	3 (1.26%)	2 (0.84%)	0%	2.94%
Permanent Hoarseness	0%	0%	0%	2 (0.84%)	0%	0.84%
Wound Infection	0%	10 (4.2%)	0%	0%	5 (2.1%)	6.3%
Seroma Formation	6 (2.52%)	7 (2.94%)	0%	8 (3.36%)	5 (2.1%)	10.9%
Thoracic Duct Injury	0	2 (0.84%)	0	1	2 (0.84%)	1.68%

all normal thyroid tissue is removed. Finally, the small risk of anaplastic transformation of WDTC can be eliminated by the complete removal of thyroid gland.[4]

In United States, the incidence of thyroid carcinoma is steadily rising in both genders not only for small localized tumors but also for the locally advanced and metastatic carcinomas. These findings suggest that the emerging screening programs and efficient diagnostic modalities are not the only reasons behind the increasing incidence, rather some other causative factors are present which are causing the increase in the frequency of thyroid malignancy, particularly papillary carcinoma.[5]

Studies compared the incidence of various thyroid carcinoma in Sao Paulo and United states demonstrated that papillary thyroid carcinoma is the most common thyroid tumour in both areas accounting about 72% and 86% respectively followed by follicular and medullary carcinoma.[5] Similar to the mentioned study, the frequency of papillary thyroid carcinoma was found to be 79.411% in our study. However, the frequency of medullary thyroid carcinoma was very low as mentioned in literature whereas in this study frequency of medullary thyroid carcinoma was around 10% which is almost similar to the frequency of follicular carcinoma.

Treatment of well differentiated thyroid carcinoma has always been a controversial issue. In literature search it was found that the incidence of recurrence decreases and survival rate improves after total or near total thyroidectomy for well differentiated thyroid carcinoma.[6,7] This approach can be practised only if preoperative diagnosis of malignancy is made via FNAC or other modes of investigations. Furthermore, for the definitive diagnosis of follicular cell carcinoma, whole of the thyroid tissue is needed to identify capsular invasion or the biopsy from the most common sites of its metastasis i.e bone and lungs. Bone metastasis is commonly found in vertebral bodies followed by pelvis, femur, skull and ribs.[8]

Treatment of medullary thyroid carcinoma (MTC) is highly specialized and variable extent of surgical resection has been suggested depending upon the clinical and radiological findings and serum calcitonin level. The only effective treatment of MTC is surgery as it usually does not respond to chemotherapy or external radiation.[9] In general, every patient with medullary thyroid carcinoma was appropriately discussed before surgery and definitive plan was made according to the guideline for the management of medullary thyroid carcinoma presented by American Thyroid Association.[10]

Various surgical procedures have been performed for the treatment of thyroid malignancy. Amongst these, total thyroidectomy is the removal of whole thyroid gland and completion thyroidectomy is the removal of the residual thyroid tissue after thyroid lobectomy or subtotal thyroidectomy due to the presence of malignancy in the histopathology report of previous tissue removed at surgery.[11] Central neck dissection is the exploration of central compartment of neck which contains level VI deep cervical lymph nodes. Modified radical neck dissection is the exploration of lateral neck compartments and removal of all the structures if needed, with the preservation of any of the following structures; sternocleidomastoid muscle, accessory spinal nerve and internal jugular vein.

Few important complications are associated with different types of thyroid surgeries which should be kept in consideration so that meticulous dissection should be performed in order to prevent such complications. These include; recurrent laryngeal nerve injury, hypocalcaemia, bleeding, seroma formation and most importantly thoracic duct injury associated with left MRND.[12] Hypocalcaemia is found to be the most common complication associated with total thyroidectomy.[13] It has been reported in up to 24% of cases in literature, however we experienced it in 7% of the patients who developed transient hypocalcaemia which subsided at 6 weeks follow up. The rate of RLN injury following thyroid surgery was estimated to 0.5 -5%.[14] The risk of damage to RLN is more important in re-do surgeries, as it has been reported to be as high as 16.2%.[15] However, meticulous dissection, use of surgical loups and following appropriate surgical steps can lower this risk.[2] No RLN injury was noted in a study by Gangiti where surgeries were performed with loupes.[2] In our study experienced surgeons performed all thyroid surgeries without using loupes or nerve monitoring device and only in seven patients transient hoarseness of voice was noted that significantly improved at six months follow-up. However, there were three patients with medullary thyroid carcinoma in whom the nerve was deliberately divided for complete resection of the tumour, as RLN was completely involved by the malignancy and complete surgical resection was the only effective mode of treatment for medullary thyroid carcinoma.

CONCLUSIONS:

The most common thyroid tumor was papillary carcinoma. Completion thyroidectomy was the most commonly performed surgical procedure. None of the patients in this series had permanent hypocalcemia.

REFERENCES:

1. Sanabria A, Kowalski LP, Shah JP, Nixon IJ, Angelos P, Williams MD, et al. Growing incidence of thyroid carcinoma in recent years: Factors underlying over-diagnosis. Head Neck. 2018;40:855-66.

2. Karkuzhali P, Yogambal M, Kumar M. An Indian tertiary care hospital scenario of papillary carcinoma of thyroid. J Clin Diag Res. JCDR. 2017;11:EC26-EC9.

3. Mitchell AL, Gandhi A, Scott-Coombes D, Perros P. Management of thyroid cancer: United Kingdom National Multidisciplinary Guidelines. J Laryngol Otol. 2016;130:S150-S60.

4. Kluijfhout WP, Rotstein LE, Pasternak JD. Well-differentiated thyroid cancer: Thyroidectomy or lobectomy? CMAJ. 2016;188:E517-E520;DOI: https://doi.org/10.1503/cmaj.160336

5. Veiga LH, Neta G, Aschebrook-Kilfoy B, Ron E, Devesa SS. Thyroid cancer incidence patterns in Sao Paulo, Brazil, and the U.S. SEER program, 1997-2008. Thyroid. 2013;23:748-57. doi: 10.1089/thy.2012.0532.

6. Hurtado-López LM, Melchor-Ruan J, Basurto-Kuba E, Montes de Oca-Durán ER, Pulido-Cejudo A, Athié-Gutiérrez C. Low-risk papillary thyroid cancer recurrence in patients treated with total thyroidectomy and adjuvant therapy vs. patients treated with partial thyroidectomy. Cir Cir. 2011;79:118-25.

7. Zhu J, Wang X, Zhang X, Li P, Hou H. Clinicopathological features of recurrent papillary thyroid cancer. Eur J Surg Oncol. 2018. DOI:10.1016/j.ejso.2018.05.009

8. Varadarajan VV, Pace EK, Patel V, Sawhney R, Amdur RJ, Dziegielewski PT. Follicular thyroid carcinoma metastasis to the facial skeleton: a systematic review. BMC Cancer. 2017;17:225. doi:10.1186/s1288 5-017-3199-3.

9. Al-Rawi M, Wheeler MH. Medullary thyroid carcinoma – Update and present management controversies. Ann R Coll Surg Engl. 2006;88:433-8.

10. Wells SA Jr, Asa SL, Dralle H, Elisei R, Evans DB, Gagel RF, et al. American Thyroid Association Guidelines Task Force on Medullary Thyroid Carcinoma. Revised American Thyroid Association guidelines for the management of medullary thyroid carcinoma. Thyroid. 2015;25:567-610.

11. Morrison SA. The surgical management of thyroid cancer. Rambam Maimonides Med J. 2014;5:2 e0008. doi:10.5041/RMMJ.10142

12. Miguel EN, Vicente TJ, Estefania LB, Roberto PC, Alencar MM, Cellice CE. Factors influencing thyroidectomy complications. Braz J Otorhinolaryngol.2012;78: 63-9.

13. Cmilansky P, Mrozova L. Hypocalcemia - the most common complication after total thyroidectomy. Bratislavske Lekarske Listy. 2014;115:175-8.

14. Tresallet C, Chigot JP, Menegaux F. [How to prevent recurrent nerve palsy during thyroid surgery?]. Ann de Chir. 2006;131:149-53.

15. Pantvaidya, G, Mishra A, Deshmukh A, Pai PS, D'Cruz, A. Does the recurrent laryngeal nerve recover function after initial dysfunction in patients undergoing thyroidectomy?. Laryngoscope Investig Otolaryngol. 2018;3:249-52. doi:10.1002/lio2.167

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