

A Study on Nodal Positivity in Central Compartment of Neck in Differentiated Thyroid Malignancies: A Study From Tertiary Care Center

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ABSTRACT

Introduction: Thyroid malignancies are the difficult one to treat. The present study was designed to study the incidence of occult nodal metastases, total nodal yield and percentage of nodal positivity in central compartment in clinically node negative patients. 2. Association between primary tumor and nodal positivity.

Materials and methods: We recruited 50 patients with Differentiated Thyroid Cancers with clinically and radiologically negative nodes admitted to surgical wards in The Department of General Surgery and Surgical Oncology, during the study period from August 2013 to February 2015. CND and DTC protocol necessary for thyroidectomy were followed. Total thyroidectomy plus CND was performed in all cases by the same surgeon. Node clearance was performed in the anatomic space bounded by the hyoid bone cephalad and the suprasternal notch caudad and from the carotid sheath on one side to that on the other side laterally. Data of Nodes obtained at operation; Number of metastatic nodes found during operation was recorded. The samples were sent to the same pathologist for histopathological report. CND results were reported as per protocol: (1) Histopathological diagnosis (2) Size of primary tumor (3) Total nodal yield (4) Number of positive nodes (5) Extra thyroid extension. The MACIS score was calculated for all cases, and patients were assigned to the low-risk (<6 points) or high-risk (>6 points) MACIS groups. 50 patients were studied.

Results: Mean age was 43.70 ± 13.461 , minimum age 21 and maximum age 68. All nodal positive cases were papillary type; none of the follicular carcinomas had central lymph node metastasis. 6 cases with tumor size >2 cm had positive central compartment nodes and 1 patient with tumor size <2 cm had positive central compartment nodes. No patient had MACIS SCORE >6, which infers that all cases were low risk group.

Conclusion: Mean age was 43.70 ± 13.461 . Papillary carcinoma is the most common type of DTC. Females have a preponderance over males (Female:Male = 2.8: 1). Tumour size >2 cm was independent risk factor for Central lymph node metastasis. Tumour size was frequently more in males.

Keywords: DTC, Differentiated Thyroid Cancer, Central Neck Dissection, MACIS, Papillary carcinoma

to the removal of all lymphatic and fibrofatty tissue located within the central compartment (level VI of the neck).

Preoperative ultrasonography (US)¹ of the central and lateral neck lymph node compartments should be performed in all patients who undergo thyroidectomy for differentiated thyroid cancer (DTC). No evidence of metastatic lymphadenopathy in patients on physical examination/preoperative imaging (No US normal will be either prophylactic/elective are controversial. By contrast when metastatic lymph nodes (NI) are apparent on preoperative staging exam and/or US, a therapeutic CLND² should be performed. Risks associated with CLND include injury to the recurrent laryngeal nerve and parathyroid glands, resulting in transient hypocalcemia or permanent parahypoparathyroidism. Recent studies have suggested that high volume of thyroid surgeons have lower rates of surgical complications. Objectives of the study were to study the incidence of occult nodal metastases, total nodal yield and percentage of nodal positivity in central compartment in clinically node negative patients and to find the association between primary tumour and nodal positivity.

MATERIAL AND METHODS

The study was conducted in Yashoda Hospital, Secunderabad, Telangana State. The study was conducted on Patients diagnosed with differentiated thyroid cancer with clinically and sonographically node negative status. 50 patients who satisfy inclusion and exclusion criteria were taken in study.

The study design was a prospective observational study. The data collected by interview technique with DTC after thorough clinical examination, investigations, treatment and follow-up details. 50 patients with Differentiated Thyroid

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INTRODUCTION

Central compartment lymph node dissection (CLND) refers

Cancers admitted in surgical wards are included in our study by applying the following inclusion and exclusion criteria, during the study period from August 2013 to February 2015.

Inclusion Criteria

1. Patients with histopathologically proven differentiated thyroid cancer.
2. Patients with clinically and sonographically node negative status.

Exclusion Criteria

1. Patients with benign thyroid swelling.
2. Patients with other than differentiated thyroid cancers.
3. Patients with preoperative clinical and sonographic node positive status.

Information on patients with DTC undergoing central compartment dissection was disseminated in health education sessions to complement the findings of study. The data were entered into MS-Excel spread sheets, and analysis was carried out. The procedures involved were transcription, preliminary data inspection, content analysis, and interpretation. Percentages were used in this study to analyze epidemiological variables.

Protocols of patients undergoing total thyroidectomy and central nodal dissection (CND)⁶ for differentiated thyroid cancers (DTC) were reviewed. Total thyroidectomy plus CND was performed in all cases by the same surgeon. Node clearance was performed in the anatomic space bounded by the hyoid bone cephalad and the suprasternal notch caudad and from the carotid sheath on one side to that on the other side laterally.

The following data were recorded: nodes obtained at operation; number of metastatic nodes and parathyroid glands incidentally resected; metastases, age, completeness of resection, invasiveness, size In all cases, the pathology study was performed by the same pathologist. CND results were reported as per protocol: (1) Histopathological diagnosis (2) Size of primary tumor (3) Total nodal yield (4) Number of positive nodes (5) Extra thyroid extension. The MACIS score was calculated for all cases, and patients were assigned to the low-risk (<6 points) or high-risk (>6 points) MACIS groups.

Data were analyzed with the use of the Statistical Package Stat view 14.2 (SAS Institute Inc., Cary, NC). Quantitative

	N	%
Mean age	43.70 ± 13.461	
Age <45/>=45	27/23	54/46
Gender (M/F)	13/37	26/74
Papillary/Follicular	48/2	96/4
Tumor Size (<2/>=2 cm)	38/12	76/24
Extra Thyroid Extension	5	10
Mean Nodal Yield	5.68 ± 2.195	
% Nodal Positivity	7	14
MACIS SCORE (<6/>=6)	50/0	100/0

Table-1: Variables in relation to Thyroid cancer

variables are expressed as mean ± SD and qualitative variables as proportions and percentages. Student t test was applied for various parameters. Contingency tables (chi-square) were used to investigate differences between qualitative variables. Significance was set at P < 0.05.

RESULTS

Patients with age < 45 were 27 and patients with age >= 45 were 23.37 were females and 13 were males. 48 (96%) reported to be papillary and 2 (4%) reported as follicular thyroid cancer. 4 patients were with tumor size >2 cm and 1 patient had a tumor size <2cm. Mean nodal yield was 5.68 ± 2.195, minimum 2 nodes to maximum 10 nodes were removed. 7 (14%) patients had positive nodes in central compartment of whom 6 were males and 1 was female.

Table 1 shows incidence of tumour in relation to age and sex, size of the tumour, extra thyroid extension and nodal positivity. MACIS score was done based on score.

DISCUSSION

50 patients were studied. Mean age was 43.70 ± 13.461. Minimum age 21 and maximum age 68. Patients with age < 45 years were 27 and patients with age >= 45 years were 23.37 were females and 13 were males. 48 (96%) reported to be papillary^{3,4,5} and 2 (4%) reported as follicular thyroid cancer.^{6,7} 38 patients had tumor size of <2cm (76%) and 12 patients had tumor size of > 2 cm (24%). Minimum dia. 0.3 cm and maximum diameter 4.3 cm with peak between 0.75 to 1.25 cm. 5

Variable	+ve Nodes Absent	Std. Dev.	Std. Err.	+ve Nodes Present	Std. Dev.	Std. Err.	T Test	Probability	Mann Whitney	Probability
Age	42.907	13.592	2.073	48.571	12.421	4.695	1.033	0.307	115.00	0.163
Sex	1.814	0.394	0.060	1.286	0.488	0.184	3.187	0.003	110.00	0.131
Tumor size >2 cm	0.140	0.351	0.053	0.857	0.378	0.143	4.972	0.000	6.00	0.000
Max Dia. cm	1.295	0.767	0.117	3.514	0.803	0.303	7.057	0.000	10.00	0.000
Extra Thyroid Extension	0.023	0.152	0.023	0.571	0.535	0.202	5.680	0.000	4.000	0.000

Table -2 Comparison between Central Compartment Metastasis and other variables

(10%) patients had extra thyroid extension of whom 4 were males and 1 was female, 4 patients were with tumor size >2 cm and 1 patient had a tumor size <2cm. Mean nodal yield was 5.68 ± 2.195 , minimum 2 nodes to maximum 10 nodes were removed. 7 (14%) patients had positive nodes in central compartment of whom 6 were males and 1 was female. All nodal positive cases were papillary type, none of the follicular carcinomas had central lymph node metastasis, which is consistent with the findings that regional lymph nodes involved more frequently with papillary carcinoma than follicular carcinoma, later has more of hematogenous spread to distant regions. 6 cases with tumor size >2 cm had positive central compartment nodes and 1 patient with tumor size <2 cm had positive central compartment nodes. No patient had MACIS SCORE > 6, which infers that all cases were low risk group.

Mean age of patients without CLNM was 42.90 ± 13.59 and with CLNM was 48.57 ± 12.42 ($p=0.30$), which is statistically insignificant. 5 males out of 13 and 2 females out of 37 had CLNM ($p=0.0025$), this implies statistically very significant. The findings of this study were similar to other studies done in the past.⁸⁻¹³

CONCLUSIONS

Mean age was 43.70 ± 13.461 . Papillary carcinoma is the most common type of DTC. Females have a preponderance over males (Female: Male = 2.8: 1). Papillary carcinoma is the most common DTC to have Central lymph node metastasis. Tumor size >2 cm was independent risk factor for Central lymph node metastasis. Tumor size was frequently more in males. Extra Thyroid Extension is more common in males. Mean nodal yield was 5.68 ± 2.195 . Central lymph node metastasis is more common in males in clinically N0 neck. Males are associated with greater morbidity owing to the extensive nature of disease in them. The risk factors for CLNM were male gender, tumor size >2 cm and capsular invasion (Extra Thyroid Extension). Routine prophylactic CND procedure for all DTC with N0 status is invalid.

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