

“Clinical study on incidence of malignancy in Hemithyroidectomised patients for benign Lesions and their further management”

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Abstract:

Background: Thyroid has fascinated the surgeon for centuries; from the second millennium BC, when it has been recorded in Chinese literature. Ancient Chinese employed ground sheep's thyroid for goitre and cretinism. Thyroid malignancy has been known to exist for over three centuries. In U.K its incidence is about 0.5 % of all cancers and is responsible for fewer than 0.5 % of all deaths due to cancer. Even now, there is no general agreement regarding the treatment of thyroid cancer. Long history together with the evolving mode of treatments has made it extremely difficult to judge the effectiveness of any single or combined therapeutic approach where in widely different view points have been expressed with great amount of convictions on either side.

Materials and Methods: Our observational study covers the result of analysis of 72 patients who underwent hemithyroidectomy based on preoperative investigations which suggested benign lesions, but the histopathological examination proved to be malignant. The patients diagnosed with malignancy are further managed by either completion thyroidectomy or suppressive dose of eltroxine. The period of study was from June 2019 to September 2021 in our institution.

Results: The study included 72 patients who underwent hemithyroidectomy, out of which 12 patients had malignancy on their histopathology. The incidence was 16.7% which correlates to world literature.

Conclusion: FNAC results showing benign lesions should be cautiously interpreted because of significant false negative reports. Most of the incidentally discovered malignancies following Hemithyroidectomies are papillary type. Most of these tumors can be regarded as occult and minimal because they rarely show evidence of extrathyroidal spread in papillary carcinoma or major capsular invasion in follicular carcinoma.

Key Word: Hemithyroidectomy, Malignancy, completion thyroidectomy, Suppressive Thyroxine, FNAC, Histopathology

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I. Introduction

Thyroid malignancy has been known to exist for over three centuries. In U.K its incidence is about 0.5 % of all cancers and is responsible for fewer than 0.5 % of all deaths due to cancer. Nevertheless it has attracted the attention of surgeon, for a number of reasons.

1. Varying biological behavior of various types thyroid malignancies.
2. There is a diagnostic challenge arising out of various modes of presentation.
3. Technical interest for a precise surgical approach.

Even now, there is no general agreement regarding the treatment of thyroid cancer. Long history together with evolving mode of treatments has made it extremely difficult to judge the effectiveness of any single or combined therapeutic approach where in widely different view points have been expressed with great amount of convictions on either side.

II. Material And Methods

Study Design: Prospective observational study

Study Location: This was a tertiary care teaching hospital based study done in Department of General Surgery, at Mahatma Gandhi Memorial Hospital, Warangal, Telangana associated to Kakatiya medical college, Warangal, Telangana.

Study Duration: June 2019 to September 2021.

Sample size: 72 patients

Inclusion criteria:

1. All patients irrespective of their economic status, social status, gender and Residence are included.
2. Clinically solitary nodule of thyroid, multinodular goitre, colloid goitre, Autoimmune conditions like Hashimoto's thyroiditis, inflammatory conditions of thyroid.
3. No suspicious lymph node enlargement
4. Clinically Euthyroid.
5. Clinically no adjacent structure invasion or any distant metastasis
6. FNAC of thyroid showed benign lesions.
7. Otherwise, general condition is fit for surgery.

Exclusion criteria:

1. Children <12 years and elderly >60 years.
2. Severe hyperthyroidism/ myxedema patients.
3. Patients presenting with fixed and hard lesions.
4. Patients with history of any other malignancies.
5. History of any prior radiotherapy or chemotherapy.

Investigations performed :

1. Routine blood investigations including viral markers, complete hemogram, Renal function tests, Liver function tests, Serum electrolytes are done.
2. Electrocardiogram of the patients.
3. Thyroid profiles including T3, T4, TSH levels.
4. Ultrasonogram of the neck.
5. Fine needle aspiration cytology of the swelling.
6. X-ray Neck, X-ray D-L-S spine for distant metastasis.
7. Ultrasonogram of the abdomen.
8. Histopathological examination of specimens of hemithyroidectomy.
9. Indirect laryngoscopy or visual laryngoscopy.

III. Aims And Objectives Of The Study

1. To study the incidence of malignancy in whom the hemithyroidectomy was done for suspected benign lesions.
2. To study types of malignancies in various benign conditions.
3. Management of those Hemithyroidectomised patients with proved malignancy, with various modalities of treatment such as completion thyroidectomy, TSH suppression with eltroxine, Radioiodine ablation, or chemotherapy.
4. To attain total cure of the disease.

Procedure methodology :

After patient selection satisfying the criteria mentioned above, above mentioned investigations were performed. Informed and written consent was taken. All 72 patients underwent Hemithyroidectomy under general anesthesia. Specimens were sent for histopathological examination post operatively. Out of 72 cases 12 showed malignancy on HPE. These patients were further managed by

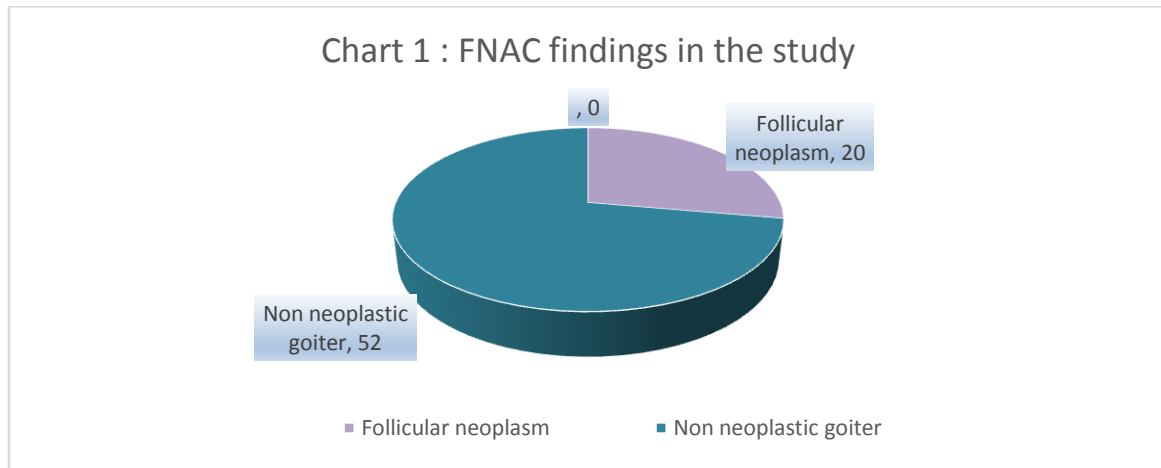
1. Completion Thyroidectomy followed by suppressive dose of thyroxine
2. Suppressive dose of thyroxine alone for TSH suppression

IV. Observations And Results

FNAC study of the thyroid swelling was done and the interpretations were as follows.

Table 1 : FNAC findings in the study

	Number	Percentage(%)
Follicular neoplasm	20	27.8
Non Neoplastic Goitre	52	72.2



All the 72 patients underwent hemithyroidectomy, our pathologist did histopathological examination of the specimen, and the interpretations were as follows:

Table 2 : histopathology of hemithyroidectomy specimens

	Number	Percentage(%)
Follicular Adenoma	48	66.7
Papillary Carcinoma	9	12.5
Follicular Carcinoma	3	4.2
Adenomatous Goiter	4	5.5
Lymphocytic (Hashimoto's) Thyroiditis	5	6.9
Follicular Adenoma with Papillary Hyperplasia	1	1.4
Follicular Adenoma with Lymphocytic Thyroiditis	1	1.4
Total	72	100.0

Table 3 : incidence of malignancy in hemithyroidectomy specimens

	Number	Percentage(%)
Papillary Carcinoma	8	11.2
Follicular Carcinoma	3	4.17
Hurthle cell tumor	1	1.39
Medullary carcinoma	0	0
Lymphoma of thyroid	0	0
Anaplastic carcinoma	0	0
Total	12	16.76

Chart 2 :Malignancy in hemithyroidectomy specimens

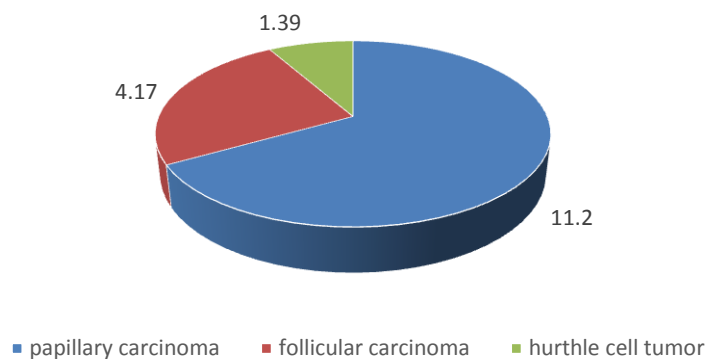


Table 4 : sex related incidence of malignancy

	Male	Female
PapillaryCarcinoma	1	7
FollicularCarcinoma	0	3
Hurthle cell tumor	0	1

Chart 3 : sex related incidence of malignancy

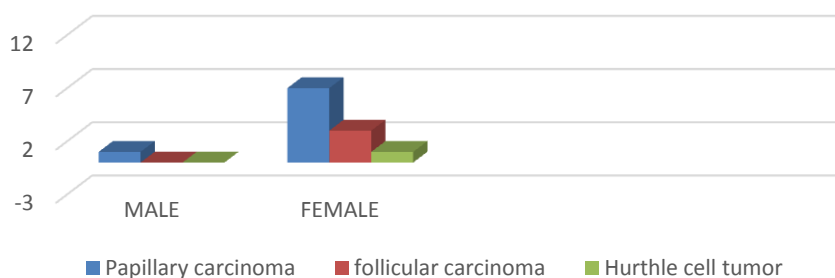
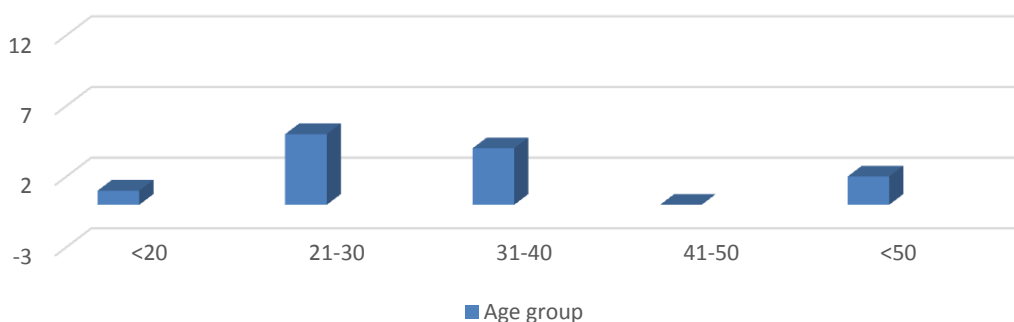


Table 5 : Agerelatedincidence of malignancy is as follows:

AgeGroup	Number
<20	1
21- 30	5
31- 40	4
41- 50	0
>50	2

Chart 4 : Age related incidence of malignancy in the study



MANAGEMENT

After diagnosing malignancy in hemithyroidectomised patients, further treatment was planned based on risk factors as well as patients' willingness.

Our patients were managed by

COMPLETION THYROIDECTOMY FOLLOWED BY SUPPRESSIVE DOSE OF THYROXINE

This was done in four patients

1. One male patient with papillary carcinoma
2. Two female patients with papillary carcinoma
3. One female patient with follicular carcinoma.

METHOD OF COMPLETION THYROIDECTOMY: By excising the old scar skin flaps were raised. Strap muscles which were adherent with thyroid capsule, carefully released and after ligating vascular pedicle, completion thyroidectomy was done. Every effort was made to safeguard both parathyroids as well as recurrent laryngeal nerve. The wound was closed with vacuum drainage.

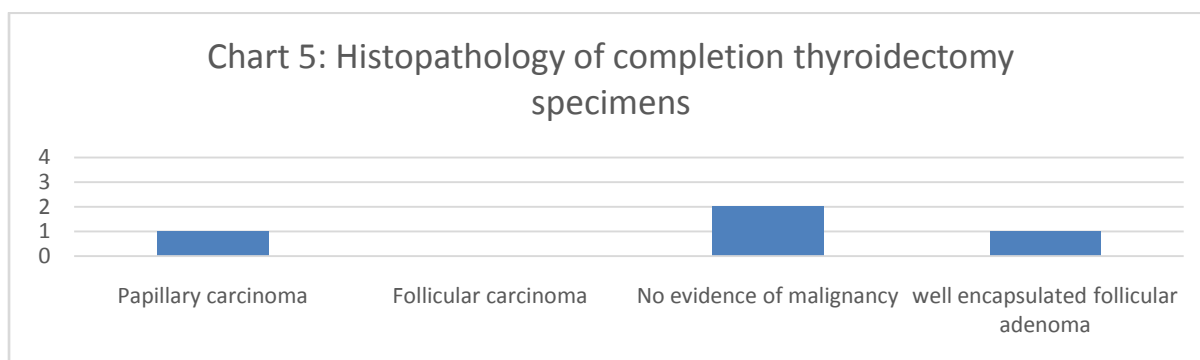
II. SUPPRESSIVE DOSE OF THYROXINE ALONE FOR TSH SUPPRESSION: It was offered to remaining 8 patients who were not willing for re-operation the dose was 0.3mg per day and the patients were subjected to regular follow-up after explaining the risk of malignancy.

III. RADIO IODINE THERAPY: It was not given to any patients because of non availability.

IV. EXTERNAL RADIOTHERAPY & CHEMOTHERAPY: No external radiotherapy and chemotherapy was given. The completion thyroidectomy specimens were subjected to histopathological examination and the results were as follows.

Table 6 : histopathology of completion thyroidectomy specimens

Papillary Carcinoma	1
Follicular Carcinoma	0
No evident of Malignancy	2
Well encapsulated follicular adenoma	1



POST OPERATIVE FOLLOW-UP: After surgery, the patients resumed normal diet on the next day of surgery. Antibiotics were exhibited for 5 – 7 days. Drains removed after 24 – 48 hours. Sutures were removed on 6 – 7 days. Patients were back to home on 8th day with advise to attend regular follow up. No morbidity was reported after hemithyroidectomy. After completion thyroidectomy, out of four patients, we had transient hypocalcaemia in one patient and another patient with transient vocal cord palsy. Later both patients recovered completely with conservative treatment. No permanent hypocalcaemia or permanent vocal cord palsy was noticed in our patients. After completion thyroidectomy the patients were put on suppressive dose of thyroxine 0.3mg per day and advised for regular follow-up.

PROGNOSIS AND FOLLOW-UP: The average period of follow-up in our study was 4 – 24 months. During follow-up, through clinical examination was done to detect the recurrence or metastasis in the cervical nodes. So far no one of our patients developed any complication like local recurrence or nodal metastasis. The dose of thyroxine therapy was adjusted to keep the serum TSH level undetectable or less than 0.1 to 0.3 mU/L. none of

them have so far developed any toxic symptoms. All the patients were doing well so far. Follow-up with ^{131}I scan or with serial estimation of thyroglobulin assay was not done because of the non-availability.

V. Discussion

We reviewed the world literature and references for our study. The incidence of malignancy in hemithyroidectomised patients as revealed in world literature is as follows.

Table 7 : Comparison between FNAC and HPE in various studies

Authors	Incidence In %
Fredrich et al ^[6]	24.3
Adwok et al.	15.0
Crile et al	24.5
Ward et al.,	15.8
Cole et al.,	24.4
Gharib et al.,	25.0
Aschraft et al.,	16.0
DH Shaw (Tata Memorial) ^[11]	25.0
Our study	16.7

Incidence of malignancy in solitary nodule of thyroid for which the hemithyroidectomy was done ranges from 11 – 20% (Kendall & Condon 1969, Pasarras et al, 1972). The reported incidence where solitary nodule goitre turning into malignancy was already discussed.

In a study by C.F.J. RUSSEL (UK) who performed hemithyroidectomy for solitary nodule of thyroid, the incidence of malignancy among those 61 patients was about 13%.

In the world literature, accuracy of FNAC is 70 – 97%. Although FNAC provides useful information regarding nature of thyroid swelling the reported incidence of false negative reports is significant and is about 17% (CUSI K. et al., 1990). Therefore, it is clear that a negative report for malignancy from FNAC study should be cautiously interpreted. If thyroid cancers are not missed a liberal policy of surgical resection of thyroid should be done preferably a hemithyroidectomy. More over FNAC cannot differentiate follicular adenoma from follicular carcinoma.

It has been recommended that incidental papillary cancer detected following surgery for benign thyroid disease confined within the capsule of the thyroid are indolent tumors with little if any clinical significance. The completion thyroidectomy is not advised for all cases they may be put on suppressive dose of thyroxine and closely observed (Surgical Clinical of North America, June 1995). But it has been proved that the residual malignant focus is found in contra lateral lobe in 50% patients with papillary carcinoma and in 33% with follicular carcinoma. Incidence of recurrence in opposite lobe is 7 – 10%, so completion total thyroidectomy is justified in patients who have thyroid carcinoma 1cm or greater. (Endocrinology and metabolism clinics of North America, march 1996).

Completion thyroidectomy was done in four of our patients, in whom three patients with papillary carcinoma and one patient with follicular carcinoma because the size of the tumor was 4cm and above preoperatively.

Further more completion thyroidectomy facilitates ^{131}I scan to be done at later time for detections of metastasis because presence of normal thyroid tissue competes with metastases for radio iodine obtained.

It is evident from the above studies that completion thyroidectomy can be done safely with minimal morbidity and no mortality Rao et al^[9] and Levin^[10] et al showed that in their study completion thyroidectomy are safe with low mortality.

RADIOIODINE ABLATION

None of our patients were treated with radio iodine. The dose of ^{131}I required for ablation of contra lateral lobe is high which carries risk of leukaemia and lymphoma (De Groot L.J et al)^[7]. Bandeson et al, reported a series of 10 parathyroid adenoma that developed in patients who received ^{131}I ablation. Because of these reasons ^{131}I ablation is not much useful in treating remaining thyroid tissue.

It has been recommended and proved that in low risk patients the type of surgery does not affect the survival adversely.

Wolff H. et al^[4] (1979-1988) reported 5 years survival rate for differentiated thyroid cancer was from 81.5% to 100% in stage $T_1N_0M_0$ (microcarcinoma) for the patients who underwent less radical procedures like hemithyroidectomy (Zentral bl-Chir 1989;114(18):1202-8).^[4]

In another study at university of Rome by Russo et al(1997)^[5]. Among 16 patients with microcarcinoma, 8 underwent total thyroidectomy and another 8 underwent hemithyroidectomy, and observed that there was no difference in long term results between different surgical treatment for microcarcinoma of thyroid. (Minerva Chir, 1997 July-August 52(7-8) 891-900).

Brooks et al., treated 222 patients with differentiated thyroid carcinoma with total thyroidectomy (43 patients) or less than total thyroidectomy (179 patients) and found no differences in recurrence or survival rate. They believe that patients with occult papillary thyroid carcinoma or follicular carcinoma with minimal capsular invasion can be treated with thyroid lobectomy and isthumectomy, because the prognosis after such treatment approaches 100%.

Woolner et al agree that treatment of choice for occult papillary carcinoma is Hemithyroidectomy and isthumectomy followed by TSH suppression. Because, inspite of multicentricity is high, there is extremely low incidence of clinical carcinoma in opposite lobe after hemithyroidectomy and TSH suppression.

VI. Conclusion

Based on our study certain conclusion is arriving at incidence of malignancy in Hemithyroidectomised patients are 16.7% which correlates with world literature (15%-25%).FNAC results showing benign lesions should be cautiously interpreted because of significant false negative reports. Conclusive reports can not be obtained by FNAC in follicular carcinoma. Most of the incidentally discovered malignancies following Hemithyroidectomies are papillary type (papillary to follicular ratio is 3:1) Most of these tumors can be regarded as occult and minimal because they rarely show evidence of extrathyroidal spread in papillary carcinoma or major capsular invasion in follicular carcinoma.

Completion thyroidectomy offers effective treatment in a group of selected patient's with minimal morbidity. In low risk patients supplementary dose of thyroxin for TSH suppression offers equally efficient therapeutic option.

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