Hemithyroidectomy: Papillary Thyroid Carcinoma in Low Risk Group Patients

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Abstract

➢ Background & Objectives:
   Papillary thyroid cancer (PTC) is the most prevalent histologic subtype of thyroid cancer accounting for more than 80% of all cases. A single size threshold of 4 cm maximized prognostic discrimination with tumors >4 cm associated with a five times higher risk of recurrence than those ≤4 cm. The purpose of this present study was to determine an effective treatment strategy for patients with small unilateral papillary thyroid carcinoma in a low risk group below tumor size ≤ 4 cm.

➢ Material and Methods:
   This is a prospective study of 300 patients who were diagnosed as papillary thyroid carcinoma by preoperative FNAC or postoperative histopathology. The age of the patients’ was ranged between 15 to 45 years. The criteria were: tumor ≤4 cm, unilateral involvement, cytological non-aggressive subtype, absence of lymph node involvement and extra thyroidal extension on ultrasonography and absence of clinical distant metastases. The study was conducted in tertiary care hospital in Bangladesh from 1989 to 2019.

➢ Results:
   300 patients were included in the study, 267 patients (89%) did not show any recurrence of disease. 33 patients (11%) came with locoregional recurrence of disease in clinical and USG findings without any distant metastasis. Maximum patients were between the ages 31-40 year followed by 21 -30 year. Female was out number male in the ratio

➢ Conclusion:
   This study can lead to a result that hemi thyroidectomy is now-a-days a better surgical option for PTC even up to tumor size of ≤4 cm.

Keywords:- Thyroid Papillary Carcinoma, Hemithyroidectomy, Size, Recurrence.

I. INTRODUCTION

Over the past 20 to 30 years there has been an increase in the incidence of thyroid cancers in whole world1-4. The majority of the new thyroid cancer cases are small papillary thyroid cancers (PTCs).

There has been a long unresolved debate in the literature with regard to the optimal initial treatment for unilateral papillary thyroid cancer (PTC), including the extent of thyroidectomy 5-8. The correct approach to treat low-risk intra thyroidal papillary thyroid carcinoma (PTC) is still controversial. The traditional paradigm of treating all patients with thyroid cancer with total thyroidectomy, radioactive iodine (RAI), and suppressive thyroid hormone therapy is no longer suitable. Rather, patients with thyroid cancer should receive treatment depending on the size of the tumor, nodal involvement and age of the patient.

The role of hemi thyroidectomy as a treatment option for low-risk tumors has expanded on the role of active surveillance. Previously, hemi thyroidectomy was only indicated for unifocal tumors <1 cm in size without preoperative evidence of extra thyroid extension or lymph node metastases (N0). More recent evidence however, suggests that hemi thyroidectomy can be safely performed in patients with larger tumors. Publication of a sentinel study in 2007 by Bilimoria9 based on the NCDB database showed that recurrence was slightly but statistically higher (9.8% vs. 7.7%) and survival was slightly lower (97.1% vs. 98.4%) in lobectomy patients vs. bilateral resection. However, lobectomy had been shown to be equivalent to near-total (NTTx) or total thyroidectomy (TTx) in survival in T1-2 N0 patients in publications from Memorial Sloan Kettering Cancer Center 10.

The controversy has been re-kindled by two recent publications for PTC even as large as 4 cm11, 12. The Japanese study reviewed over 1,000 patients who underwent lobectomy for tumors up to 4 cm in size, with a follow-up period of 17.6 years (without addition of RAI), in the absence of clinically positive lymph nodes or extra thyroidal extension where no patient died under 45 years of age. The American study re-analyzed 61,775 patients from the NCDB, and overall survival was similar in patients undergoing total thyroidectomy versus lobectomy for tumors 1-4 cm in size.
PTC, even though the label of cancer is applied to these small tumors, with rare exception, they are biologically innocent. Even though spread to lymph nodes at surgical resection occurs in about 30% [13, 14], these metastasis are usually quite small and recurrence is seldom seen.

**Objective**
The purpose of the present study was:
- To determine an effective treatment strategy for patients with small unilateral papillary thyroid in a low risk group below tumor size ≥4 cm.

**II. METHODS**

**Study design:** prospective study  
**Study sample:** 300 patients  
**Sampling technique:** Simple random sampling  
**Study period:** 30 years (1989-2019)  
**Study places:**
- Bangladesh Medical College Hospital  
- Popular Medical College Hospital  
- Combined Military Hospital, Dhaka  
- Padma General Hospital

**Inclusion criteria**
- Tumor size ≤4 cm  
- Unilateral involvement  
- Diagnosed as papillary thyroid carcinoma by preoperative FNAC or postoperative histopathology  
- Cytological non-aggressive subtype  
- Absence of lymph node involvement and extra thyroidal extension on ultrasonography  
- Absence of clinical distant metastases

**Exclusion criteria**
- Patients unfit for surgeries  
- Patients not giving consent

**Procedure**
Patients were included in the study according to the selection criteria. Each of the patients & patients’ attendants were thoroughly counseled regarding nature of disease, prognosis, surgical options, advantages & disadvantages of each options and importance of regular follow-up.

All surgeries were done under general anesthesia. Transverse skin crease incision being made. Skin & subplatysmal flap were elevated. Affected lobe of thyroid was mobilized. Recurrent laryngeal nerve and parathyroid glands were identified & preserved in each case. After hemostasis wound closed in layers keeping 01 drain in situ. During anesthetic recovery, vocal cord movement was checked in every case.

Following surgery, patients were kept in close observation in post-operative ward. Drain was usually removed on 2nd or 3rd POD depending on & color of fluid in drain tube. After removal of drain patients were discharged from hospital and advised to come with histopathology report on 7th POD.

**Follow-up schedule**
- After reviewing histopathology report patients were advised for follow-up monthly for first 03 months then every 03 months for next 06 months and yearly for the rest of their life.
- All patients had followed up by a median period of 25 months (range= 6 to 166 months).
- During each visit they were advised to bring the test reports of TSH, FT₄, Thyroglobulin and patients were clinically examined.

**III. RESULT**
In our study total 300 patients were included. Among them 191 (63.67%) were female & 109 (36.33%) were male shown in Table 1. Majority of the patients (46.67%) were aged between 31 to 40 years. The youngest patient was 17 years old and the oldest being 43 years presented in Table 2.

Preoperative USG of each patient was done. All of them were unilateral involvement with tumor size ≥4 cm. 281 (93.67%) patients were diagnosed as papillary thyroid carcinoma by pre-operative FNAC. Rests of the patients were initially diagnosed as benign tumor of thyroid. After surgery histopathology revealed papillary carcinoma (Table 3).

All patients had undergone hemi thyroidectomy without Radioactive Iodine Ablation and followed up by a median period of 25 months.

Among 300 patients, 267 patients (89%) did not show any recurrence of disease. 33 patients (11%) came with locoregional recurrence of disease in USG findings with raised S.Thyroglobulin (Table 4). Amongst the recurrent 33 patients 24 (73%) were female & 9 (27%) were male (Table 5). Recurrences were more frequent 15 patients (45.45%) were between 31-40 years of age (Table 6). Completion thyroidectomy with Radioactive Iodine Ablation was done in recurrent cases.
Sex distribution | Number of patients | %
---|---|---
Female | 191 | 63.67
Male | 109 | 36.33
300 | 100

Table 1: Sex Distribution of study population (n=300)

| Age (Years) | Number of patients | %
---|---|---
11-20 | 11 | 3.67
21-30 | 118 | 39.33
31-40 | 140 | 46.67
41-50 | 31 | 10.33
300 | 100

Table 2: Age distribution of study population (n=300)

| Histodiagnosis | Number of patients | %
---|---|---
Papillary thyroid carcinoma | 281 | 93.67
Nodular goiter | 19 | 6.33
300 | 100

Table 3: Preoperative diagnosis by FNAC (n=300)

| Result | Number of patients | %
---|---|---
No recurrence | 267 | 89
Recurrence | 33 | 11
300 | 100

Table 4: Result following hemithyroidectomy on follow-up (n=300)

| Sex distribution | Number | %
---|---|---
Male | 24 | 73
Female | 9 | 27
300 | 100

Table 5: Sex distribution among recurrent cases (n=33)

| Age (Years) | Number | %
---|---|---
11-20 | 3 | 9.09
21-30 | 13 | 39.4
31-40 | 15 | 45.45
41-50 | 2 | 6.06
33 | 100

Table 6: Age distribution of recurrent cases (n=33)

IV. DISCUSSION

It is evident that thyroid cancer rates are on the rise and is considered the most prevalent endocrine malignancy all over the world; and histologically mostly the papillary thyroid carcinoma\(^\text{15,16}\). Till to date, the treatment options remain in the dilemma to the extent of surgery in low risk PTC.

Thyroid surgery either total thyroidectomy or hemithyroidectomy should be performed by high-volume surgeons (>25 thyroid surgeries yearly) to avoid surgical complications\(^\text{17,19}\). Till to date, the treatment options remain in the dilemma to the extent of surgery in low risk PTC.

In our series it is experienced that hemithyroidectomy is appropriate for low-risk thyroid cancer to prevent recurrence. It is more than ever essential to explain the merits/demerits of the modalities of surgery i.e. total thyroidectomy versus hemithyroidectomy in presence of the patients/attendants. So they can be well aware themselves fully in a conversation around what is the best modalities of surgery. In our study, each of the patients & patients’ attendants were thoroughly counseled regarding nature of disease, prognosis, surgical options, advantages & disadvantages of each options and importance of regular follow-up.

It has been observed in the published literature so far that patients with thyroid cancer >1 cm and ≤ 4 cm without extrathyroidal extension, without clinical evidence of any lymph node metastases, the initial surgical procedure can be either a near-total/total thyroidectomy or a lobectomy\(^\text{20-23}\). The higher surgical risks e.g. transient or permanent post-surgical hypothyroidism, recurrent laryngeal nerve injury unilateral or bilateral, hematoma formation, infection are documented in total or near total thyroidectomy especially in the hands of inexperienced surgeons. These patients need lifelong thyroid hormone replacement and postoperative radioiodine ablation (RAI)\(^\text{24-25}\). A study by Popadich et al found that the addition of
routine central lymph node dissection with thyroid surgery in patients in cN0 papillary thyroid carcinoma reduced the need for reoperation in the central compartment and was associated with lower postoperative thyroglobulin levels.26-27.

In this study, hemithyroidectomy was carried out in all 300 patients and no patient had developed any perioperative or postoperative surgical complications. The only drawback experienced after surgery was regarding their biochemical follow-up; therefore, the follow-up mostly relied on clinical assessment and ultrasonography findings. In this series, locoregional recurrence was found in only 33 cases (11%) who needed second surgery which is also shown in other study.28-29. There was no evidence of distant metastasis noted in those recurrent patients on our follow up.

A follow-up for 6 years in low risk PTC hemithyroidectomy patients done by Siassakos et al in 2008 and identified no recurrence, metastases or mortalities. The authors concluded that in this sample of patients with PTC, no further surgical or radiotherapeutic intervention was warranted.28-29. Another similar study showed in 281 PTC patients where only 3.9% developed locoregional recurrence, and a single patient had lung metastasis.27,30. In this study, at the time of final follow-up with a median of 7 years, 89% were free of disease and 11% had recurrence who underwent second surgery which correlates almost similar result cited in the above observation.

Total thyroidectomy with RAI and lifelong thyroid hormone replacement had increased chance of developing complications. On the other hand, hemithyroidectomy does not need RAI and hormonal replacement thus reduce the cost/extra burden in the developed and developing country.

Though further large scale study should require to determine the optimal treatment option for low risk PTC, but this study can lead to a result that hemithyroidectomy is at the present days considered as a better surgical modality even up to tumor size of ≤4 cm. In this study locoregional recurrence was found in only 11% cases without any evidence of distant metastases. It is found here that recurrences were more frequent 45.45% between the ages of 41 to 45 year and less frequent in the ages 31 to 40 year.

Follow up by serial USG is one of the most important parameters in hemi thyroidectomy patients of PTC.

V. CONCLUSION

A papillary thyroid carcinoma equal or less than 4 cm, confined to unilateral thyroid lobe with no lymph node involvement or extra thyroidal extension and in the absence of distant metastases, hemithyroidectomy is the treatment of choice. Surgical options and importance of postoperative follow up details should be discussed clearly to the patients before embarking to surgery.

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