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Advanced thyroid cancers-16 years of our institutional experience

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Abstract

Background: Advanced carcinoma of differentiated thyroid cancers are not uncommon and surgery is the main modality, but often they are advised palliative therapy. Many of the tumors are operable with en bloc resection of adjacent organs like trachea, recurrent laryngeal nerve, esophagus, major vessels and strap muscles. To avoid such morbidity, non-operative treatments are practiced. The selection of patients is important to consider major radical surgery in order to attempt cure, with acceptable morbidity avoiding perioperative mortality. Final outcome shall be with improved overall and disease free survivals and good quality of life with functional preservation of vital organs like larynx and esophagus.

Materials and Methods: We have retrospectively studied 150 cases of advanced thyroid cancers operated in the department of surgical oncology, 1997-2013. The extent of primary, nodal disease and imaging studies were reviewed. The type of surgery performed, extra thyroidal extension and final histopathology were noted down. Follow up information was noted and all efforts were made to find the current status of the patients.

Results: Most of the patients underwent total thyroidectomy with lymph node dissection. Papillary carcinoma was the most common histopathological type.

Conclusions: Advanced thyroid cancers can be resected en bloc with an attempt to cure in view of indolent nature.

Keywords: extra thyroid extension, tracheal resection, recurrent nerve, papillary carcinoma

Introduction

Well differentiated thyroid cancers confined to thyroid have excellent prognosis, with surgery alone. Whenever the tumor extends beyond thyroid and infiltrate adjacent organs required radical surgery with some amount of morbidity. Well-established adverse prognostic factors include age, extra thyroidal extension, tumor histology, primary tumor size, and distant metastasis [1].

Extra capsular extension is defined as the primary tumor, infiltrated and extended beyond the thyroid capsule and has involved the adjacent structures, such as the trachea, larynx, esophagus, muscles, recurrent laryngeal nerve and vascular structures. Extra thyroidal extension has the greatest negative impact on prognosis, with 10-year overall survival rates dropping to 45% in patients who have extra thyroidal extension compared with 91% for those who have encapsulated tumors (confined to thyroid) [2]. The reported incidence of extra thyroidal extension in well-differentiated thyroid carcinoma varies from 6% to 13% [1-4]. Invasion of extra thyroidal soft tissues occurs by the primary tumor but may also be seen with extra nodal extension [5].

Surgery remains the main treatment for locally advanced thyroid cancers invading the trachea, esophagus, and recurrent laryngeal nerve. However, extensive resection of such tumors sometimes may result in the deterioration of the patient's quality of life [6]. The surgeon should consider the patient's prognosis and also the preservation of organ function. We discuss our experience with locally advanced thyroid cancers operated in our institute.

Materials and Methods

We have done retrospective study of 150 cases of advanced thyroid cancers operated in our institute between 1999 and 2013. These cases had locally advanced, loco regionally

advanced and or metastatic disease at presentation. The symptoms like neck swelling, dysphagia, dyspnea or change in voice along with duration were noted down. Patients were investigated with fine needle aspiration cytology (FNAC), thyroid function tests, USG neck or CECT neck and bone scan (if symptoms). All had undergone surgery in the form of total thyroidectomy with or without regional lymphadenectomy and en bloc resection of contiguously involved adjacent structures like recurrent laryngeal nerve, trachea, esophagus, strap muscles or internal jugular vein. Tracheal ring resections with or without trachea stomy, sleeve resection of trachea with tumour, en bloc excision of part of esophageal wall and recurrent laryngeal nerve was done where deemed necessary intraoperatively. Neck dissection was done in the form of central compartment neck dissection (CCND), selective neck dissection (SND) and or modified radical neck dissection (MRND). The final histopathological examination (HPE) with type of tumour, size of the tumor, no of lymph nodes (LN) involved and extra capsular extension(ECE) were noted down.

Results

Out of the 150 cases included 88(58.7%) were females and 62(41.3%) were males. The age at presentation ranged from 16 years to 85 years with most of the patients between age group 30-60 years (67.3%). Most of the patients presented with neck swelling (goitre) of duration ranging from 10 days to 30 years. 57 cases had goitre of more than one year duration out of which 15 had large goitres of more than 10 years duration. Next most common mode of presentation was neck lymph nodes (table 1).

Table 1: Symptoms at presentation

Symptoms	Number (%)
Goiter	142(94.6%)
Neck LN	58(38.7%)
Change of voice	31(20.7%)
Dysphagia	21(14%)
Dyspnea	12(8%)
Bone pains	9(6%)

Most of the patients underwent total thyroidectomy with LN dissection. In 8 patients surgery was not done because of advanced malignancy (inoperable). 87(58%) patients had tumours of size more than 4cm. 72(48%) cases had strap muscle involvement, 48(32%) cases had recurrent laryngeal nerve (RLN) involvement, 59(39.35%) cases had tracheal involvement, 35(23.3%) cases had esophageal wall

involvement, and 9(6%) patients had internal jugular vein (IJV) involvement, 11(7.3%) had lung metastasis and 8 (5.3%) had bone metastasis (Table 2).

Table 2: Types of surgery done

Surgery done	Number (142)
Total thyroidectomy	47(33.1%)
Total thyroidectomy + CCND	15(10.6%)
Total thyroidectomy + MRND	29(20.4%)
Total thyroidectomy + FND	19(13.4%)
Total thyroidectomy + SND	3(2.1%)
Total thyroidectomy + CCND + MRND	4(2.8%)
Completion thyroidectomy	18(12.7%)
Completion thyroidectomy + CCND	2(1.4%)
Completion thyroidectomy + MRND	5(3.5%)

Papillary carcinoma thyroid was the most common histopathological type 124(82.7%), followed by follicular carcinoma 15(10%), medullary carcinoma 7(4.7%) and anaplastic 4(2.7%). In 67 patients lymphnode was reported as metastatic. The number of LN's involved ranged from 1 to 40 depending on the type of neck dissection.

6 patients underwent tracheal resection, 6 patients underwent esophageal wall resection and 7 patients underwent IJV resection en bloc with thyroid tumours. 26 patients underwent tracheostomies in view recurrent laryngeal nerve sacrifice due to involvement by tumour or due to tracheal ring sacrifice. One patient with inoperable tumor underwent tracheotomy as palliative procedure. Patients with adjacent structures involvement like trachea, esophagus, recurrent laryngeal nerve, IJV and or strap muscles underwent en bloc resection with the thyroid tumour. Tumours involving tracheal cartilage underwent either tracheal ring resection or sleeve resection or shaving off of the tumour from the rings.

Discussion

Resection of thyroid cancers with disease with negative margins is the best curative attempt. Morbidity is significant by sacrificing vital structures e. g. larynx. Some authors suggest 'shaving of tumour off the vital structures with adjuvant I^[131] and EBRT achieves similar outcomes. Others argue for en bloc resection. We have done en bloc resection of tumour with adjacent organ involved in an attempt to cure.

The most common histopathological type in locally advanced tumours was papillary carcinoma which was also common in other studies (table 3).

Table 3: Histopathological types of thyroid cancers (n=150).

Histopathological type	Our study	Michael <i>et al</i> [7]
Papillary ca thyroid (classical+ Follicular variant)	89+35 (82.7%)	80.8%
Follicular ca thyroid	15(10%)	18.58%
Medullary ca thyroid	7(4.7%)	-
Anaplastic ca thyroid	4(2.7%)	-

The reported incidence of extrathyroidal extension of tumour with involvement of adjacent structures correlated with other studies (table 4)

Table 4: cases with extra thyroidal extension

Site of involvement	Our study	McCaffrey TV [8]
Strap muscles	72(48%)	53%
Recurrent laryngeal nerve	48(32%)	47%
Trachea	59(39.3%)	37%
Esophagus	35(23.3%)	21%
IJV	9 (6%)	-

Lung metastasis	11(7.3%)	-
Bone metastasis	8 (5.3%)	-

If a functioning recurrent laryngeal nerve is adherent to well-differentiated thyroid cancer but can be peeled cleanly off during surgery, the nerve may be structurally preserved without resection as long as no gross disease is left. If not possible should be resected after ensuring that contralateral nerve is spared. There is no difference in local, regional or distant recurrence or survival in patients with pre-operatively functioning cords who have their RLN peeled from disease. The 'peeled' nerve recovers in 60% (most-4/5-within 6 month) [9]. In present study out of 48 cases with RLN involved unilaterally, nerve was sacrificed in 40 cases and peeling of nerve from the tumour was done in 8 cases, with consequent tracheostomy where deemed necessary.

Tracheal invasion occurs in one third of cases of locally invasive thyroid cancer and is the third most common site of local invasion following the strap muscles and the recurrent laryngeal nerve [10]. Invasion of the esophagus and trachea is reported in the literature as having an incidence varying from 1% to 6.5% [11, 12]. In the present study tumours involving tracheal cartilage underwent either tracheal ring resection or sleeve resection or shaving off of the tumour from the rings en bloc with the tumour. Esophageal mucosa is relatively resistant to invasion so most often only the muscularis layer is involved. Resection with negative margins is necessary. Small defects can be closed primarily if there is no tension. Circumferential defects require reconstruction with a flap. In present study patients with esophageal wall involvement underwent resection of part of the esophageal wall and primary repair with one case requiring with PMMC flap.

If carotid artery or IJV is involved with less than complete circumferentially, it may be possible to resect disease. Complete resection with saphenous vein or PTFE graft reconstruction is described (for carotid artery). In present study carotid sheath was involved in 9 cases without invasion of the IJV, carotid artery or vagus, which was removed along with the tumour. IJV was involved in 9 cases (unilaterally) which was sacrificed.

Post-operative radio iodine scan was advised in all patients but only 40 patients underwent the above procedure. In 30(19.7%) patients there was no residual, minimal residual in 8(5.3%) and in 2 patients there was gross residual thyroid tissue was present in thyroid bed. External RT was advised in 13(8.6%) patients because of gross residual and inoperable disease.

Conclusion

Papillary carcinoma is the most common histopathological type in tumours with advanced thyroid cancer. En bloc resection of adjacent organs involved should be attempted for cure without much resultant morbidity.

Conflicts of interest: nil.

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