Original Research Article

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Hypothyroidism in surgically treated T4 hypopharyngeal and laryngeal cancers

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ABSTRACT

Background: Total laryngectomy in laryngohypopharyngeal cancers, both in primary setting and salvage scenario, include variable amounts of thyroid resection. Although considerable proportion of these cases undergo total thyroidectomy, with an intention of wider surgical clearance, histopathological examination for thyroid infiltration, very often indicate that such resections are generally out of proportion to the actual oncological requirement.

Methods: Forty three patients undergoing total laryngectomy with no prior thyroid dysfunction, from April 2014 to 2016, at our centre, were prospectively studied for post treatment, thyroid function with tests done at 6th month. Overt and occult hypothyroidism was correlated with extent of thyroid preserved intraoperatively.

Results: Of 43 patients studied, 82% had extralaryngeal spread, and 16% of them showed thyroid gland infiltration. Only 7% were patholog1ically correlated for gland infiltration. Among those who had hemithyroidectomy, clinical hypothyroidism was seen in 20% primary and 85% salvage cases by 6th month of post treatment period.

Conclusions: In clinicoradiologically favourable scenarios, thyroid preservation attempt helps to augment the neopharynx closure line and to preserve the parathyroids. Anatomical preservation however doesnot guarantee thyroid function, which needs regular follow up to avoid post-operative complications and better QOL.

Keywords: Hypothyroidism, Total laryngectomy/pharyngolaryngectomy, Chemotherapy, Radiotherapy

INTRODUCTION

Laryngectomy procedure done worldwide consist of varying levels of thyroid preservation. Thyroid gland can be spared during laryngectomy unless extralaryngeal tumour abuts or invades or metastasise to the gland without affecting, local recurrence rates or disease free survival. However whether the preserved thyroid functions normally, is a matter of debate because of the possible influence of radiotherapy or chemotherapy enhanced radiotherapy (CERT). Chemoradiation causes higher incidence of hypothyroidism than radiation alone. Hence, routine total thyroidectomy has been suggested for better oncological outcome by some authors to which we don't subscribe based on our clinical experience.

The aim of the study was to assess the thyroid function status of all patients undergoing laryngectomy for squamous cell carcinoma of larynx or hypopharynx either in a salvage setting or in a primary setting after completion of radiation therapy. Also to determine the utility of preserving varying amounts of thyroid during the procedure.

METHODS

Retrospective analysis of a prospectively maintained data was done. Patients undergoing primary or salvage laryngectomy from April 2014 to 2016 at our centre, were included in the study and thyroid function tests were assessed at 6th follow-up month after treatment. Those

patients, on prior thyroid supplements were not included in the study. The patients were categoriesed into 3 groups depending on extent of thyroidectomy as Group 1- total thyroidectomy, Group II- hemithyroidectomy, and Group III- isthumectomy respectively. Extent of intraopertative thyroid preservation was correlated with longterm thyroid function. This was an Observational study/clinical audit.

RESULTS

A total of 43 patients were included in the study, of which 49% were salvage cases (Figure 1). Mean follow up period was 12.6 months. Preoperatively, 81.3% had extralaryngeal spread with 16.2% showing thyroid infiltration radiologically. But, only 7% were confirmed on final histopathological examination. 39.5% and 53% of the subjects enrolled, developed overt hypothyroidism and subclinical hypothyroidism respectively during follow up. Among thyroid spared group, 42% of salvage and 11.7% of primary cases developed hypothyroidism during a mean follow up period of 12.6 months.

Among group II patients, 85% developed overt hypothyroidism in post radiorecurrent salvage scenario

(Table 2) as against 20% in primary surgical cases during follow up (Table 1). Subclinical hypothyroidism was noted in 39% and 61% of group II and III patients respectively (Table 3). Longterm calcium supplementation was required in 17% cases due to associated total thyroidectomy with central compartment clearance or gastric pull up procedure.

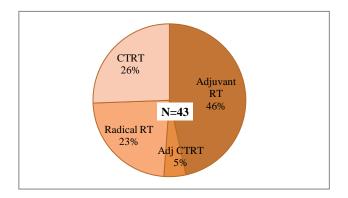


Figure 1: Distribution of the total 43 patients enrolled in the study with 51% as primary cases who had either adjuvant radiation or chemoradiation and the rest 49% as salvage cases.

Table 1: Distribution of overt hypothyroidism in primary surgery group with respect to extent of thyroid preservation.

Hypothyroidism in primary surgery group								
Primary (n=22)	Group I (n=5)		Group II (n=10)	Group III (n=7)				
XRT (20) (90.9%)	4	100%	2 20%	0 0%				
CTRT (2) (0.9%)	1	100%	0	0				

Table 2: Distribution of overt hypothyroidism in salvage surgery group with respect to extent of thyroid preservation.

Hypothyroidism in salvage surgery group								
Salvage (n=21)	Group I (n=2)		Group II (n=7)		Group III (n=12)			
XRT (10) (47.6%)	1	100%	4	85%	0	16.60%		
CTRT (11) (52.3%)	1	100%	2	03%	2	10.00%		

Table 3: Distribution of subclinical hypothyroidism in in patients with respect to extent of thyroid preservation.

Incidence of subclinical hypothyroidism							
(n=23)	Group I		Group II		Group III		
Primary (14)	0	0%	8	39%	6	61%	
Salvage (9)	0		1		8		

DISCUSSION

Total thyroidectomy as a routine procedure with laryngectomy was introduced way back in 1955.² The reason attributed was direct spread into the gland. However the incidence of thyroid involvement was noted to be around 10%.³ This was noted, especially when anterior comissure, cricothyroid membrane was involved. Probably due to the stretching of collagen bundles by the

tumour and creating direct pathway towards extralaryngeal space. Similarly subglottic extension of more than 1cm and paraglottic extension also have been reported as a predictor for extralaryngeal spread and thyroid involvement. Subglottic extension more than 1.5 cm has been reported to have 100% chance of thyroid gland involvement as against 8% when its 0.5 cm into subglottis. One of the main reasons for treatment failure has been attributed to, inadequate level 6 clearance in subglottic extension cases. 10,11 Extralaryngeal spread via thyroid cartilage is directly proportional to the calcification status of the thyroid cartilage. 12,16

The incidence of hypothyroidism in treated advanced head and neck cancer patients is approximately 6-15% when radiotherapy alone. It rises to 28% when accompanied with surgery and 35-65% when associated with hemithyroidectomy. The incidence in those who undergo total laryngectomy with ipsilateral hemithyoidectomy, is around 44-89%. This is due to surgical manipulation or radiation therapy causing disruption of gland vascularity or immune mediated response to radiotherapy as evidenced by the elevated levels of anti thyroglobin and or antimicrosomal antibody titres. The time of onset of hypothyroidism in post treated T4 hypopharyngeal and laryngeal cancers is 42 days versus 110 days in salvage and primary cases respectively.

Early recognition of hypothyroidism is important in post treatment scenarios. Clinical presentations include slowed mentation, depression, skin dryness, pleural and pericardial effusions, decreased gastrointestinal tract motility, weight gain, cold intolerance, congestive heart failure, acceleration of atherosclerosis and hypercholesterolemia. Besides these clinical implications, occult or overt hypothyroidism can impair overall wound healing, acquisition of development of tracheaesophageal speech, and increase the chance of developing thyroid cancer. ^{21,22}

CONCLUSION

During laryngectomy, preservation of unilateral or bilateral thyroid lobes is based on imageological and or intra op evidence of thyroid infiltration. The thyroid lobe serves to augment the neopharyngeal closure and enhance parathyroid preservation. However, overall thyroid function preservation depends upon the extent of resection and the amount and mode of adjuvant radiotherapy received at the thyroid bed. The current study therefore points to a risk based strategy for continued post laryngectomy thyroid function monitoring and treatment.

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