Neck Dissection in Differentiated Thyroid Carcinoma

Essay

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List of Abbreviations

Abb.	Full term
AHNS	*American head and neck society*
AJCC	*American Joint Committee on Cancer*
ATA	*American Thyroid Association*
CCA	*Common carotid artery*
CT	*Computerized topography*
CLND	*Cervical lymph node dissection*
CT	*Cricothyroid muscle*
DCM	*Deep cervical muscles*
DRS	*Delayed Risk Stratification*
DTC	*Differentiated thyroid carcinoma*
ECA	*External carotid artery*
ETA	*European Thyroid Association*
FDG-PET	*Flourodeoxyglucose positron emission tomography*
FTC	*Follicular Thyroid Carcinoma*
HB	*Hyoid bone*
ICA	*Internal carotid artery*
IJV	*Internal jugular vein*
IS	*Thyroid isthmus*
LL	*Left thyroid lobe*
MRI	*Magnetic resonant imaging*
MTV	*Middle thyroid vein*
OL	*Oblique line of the thyroid cartilage*
PBs	*Psammoma bodies*
PG	*Parotid gland*
PL	*Pyramidal lobe*
PN	*Phrenic nerve*
PT	*Inferior parathyroid*
PTC	*Papillary Thyroid Carcinoma*
QOL	*Quality of life*
RL	*Right thyroid lobe*
RLN	*Recurrent laryngeal nerve*

List of Abbreviations Cont...

Abb.	Full term
RLN	*Recurrent laryngeal nerve*
SAN	*Spinal accessory nerve*
SCM	*Sternocleidomastoid muscle*
SEER	*Surveillance, Epidemiology, and End Results*
SG	*Submandibular gland*
SKN	*Skin*
SN	*Sympathetic nerve chain*
ST	*Sternothyroid muscle (reflected);*
TC	*Thyroid cartilage*
Tg	*Thyroglobulin*
TH	*Thyrohyoid muscle*
TR	*Trachea.*
US	*Ultrasonography*
WBS	*Whole-body scan*
WDT-UMP	*Well- differentiated tumor of uncertain malignant potential*

Abstract

Although central neck dissection is indicated in clinically nodal positive disease, it remains controversial in patients with no clinical evidence of nodal metastasis.

Some authors recommend routine central neck dissection in order to prevent a future recurrence, citing the high risk of positive lymph nodes, the accuracy of staging, better outcomes, reduced postoperative thyroglobulin (Tg) levels, and a lower morbidity rate associated with the first operation.

Whereas others suggest that this procedure increases the risk of injury to parathyroid glands and recurrent laryngeal nerves, without any demonstrable benefits in terms of long-term survival.

Keywords: Thyroid cartilage- Thyroglobulin- Sympathetic nerve chain- Phrenic nerve Inferior parathyroi

INTRODUCTION

Thyroid cancer is the most common endocrine malignancy, and its incidence is increasing at the highest rate among cancers in both the US and worldwide. The National Cancer Institute's annual Surveillance Epidemiology and End Results database estimates that there will be 62,450 new cases of thyroid cancer in the US in 2015, with an incidence of 13.5 per 100,000 ***(Pellegriti et al., 2013).***

Overall, differentiated thyroid cancer has a 10-year survival rate of greater than 90%. However, despite its promising survival rate, local recurrence occurs in 20%–30% of papillary thyroid cancer patients due to clinically undetectable metastasis to cervical lymph nodes ***(Friedman et al., 2011).***

Cervical lymph node metastases are a common feature of papillary thyroid carcinoma, occurring primarily in the central compartment (level VI) with an incidence between 20% and 90% (average 60%) ***(Haugen et al., 2015).***

Conversely, follicular thyroid cancer often spreads hematogenously, and rarely metastasizes to the cervical lymph nodes. Hurthle cell thyroid cancer is a rare and aggressive form of differentiated thyroid cancer of follicular cell origin. Hurthle cell thyroid cancer displays a lower rate of cervical lymph node metastasis compared to papillary thyroid carcinoma ***(Goffredo et al., 2013).***

Surgery, typically in the form of a total thyroidectomy, has been accepted as the treatment of choice for most patients with differentiated thyroid cancer. There is also consensus in regard to treating patients with clinically evident level VI nodal disease with central neck dissection at the time of initial surgery ***(Shan et al., 2012).***

However, the addition of a prophylactic central neck dissection to total thyroidectomy in clinically node-negative patients with differentiated thyroid carcinoma remains controversial due to lack of prospective randomized controlled studies ***(Carling et al., 2012).***

American Thyroid Association Guidelines for Adult Patients with Thyroid Nodules and differentiated thyroid cancer, recommended the following:

- Prophylactic central-compartment neck dissection (ipsilateral or bilateral) should be considered in patients with papillary thyroid carcinoma with clinically uninvolved central neck lymph nodes (cN0) who have advanced primary tumors (T3 or T4), clinically involved lateral neck nodes (cN1b), or if the information will be used to plan further steps in therapy. (Weak Recommendation, Low-quality evidence).
- Thyroidectomy without prophylactic central neck dissection may be appropriate for small (T1 or T2), non-invasive, clinically node-negative parathyroid cancer (cN0) and most

follicular cancers. (Strong Recommendation, Moderate-quality evidence) ***(Haugen et al., 2015).***

A selective lateral neck dissection includes the lymph nodes of levels III, IV, and V. However, this dissection usually does not extend posterior to the sternocleidomastoid muscle and to the border of the trapezius. It is generally agreed that this should be performed in the presence of clinically apparent disease and in conjunction with a central compartment dissection ***(Pereira et al., 2005).***

The regional metastases to the cervical lymph nodes were traditionally believed to have an effect only on recurrence rate, but not mortality. However, in 2006, a population-based study from Sweden found lymph node metastases in both the central and lateral compartments to be a prognostic factor for patients with differentiated thyroid cancer. This finding complicated debate in the literature with regard to the initial treatment of differentiated thyroid cancer ***(Zetoune et al., 2010).***

AIM OF THE WORK

To review different modalities of neck dissection in differentiated thyroid carcinoma & highlight the latest updates in management of Lymph nodes in differentiated thyroid carcinoma.

SURGICAL ANATOMY OF THE THYRIOD GLAND

Embryology

In the embryo, at 3–4 weeks of gestation, the thyroid gland appears as an epithelial proliferation in the floor of the pharynx at the base of the tongue between the tuberculum impar and the copula linguae at a point later indicated by the foramen cecum. The thyroid then descends in front of the pharyngeal gut as a bilobed diverticulum through the thyroglossal duct. Over the next few weeks, it migrates to the base of the neck, passing anterior to the hyoid bone. During migration, the thyroid remains connected to the tongue by a narrow canal, the thyroglossal duct ***(Berbel et al., 2010)***.

The lobes of thyroid gland

The thyroid gland is a butterfly-shaped organ and is composed of two cone-like lobes or wings, lobus dexter (right lobe) and lobus sinister (left lobe), connected via the isthmus. Each lobe is about 5 cm long, 3 cm wide and 2 cm thick. The organ is situated on the anterior side of the neck, lying against and around the larynx and trachea, reaching posteriorly the oesophagus and carotid sheath. It starts cranially at the oblique line on the thyroid cartilage (just below the laryngeal prominence, or 'Adam's Apple'), and extends inferiorly to approximately the fifth or sixth tracheal ring ***(Kim et al., 2013)***.