

Reoperative central neck surgery

**R. Pandev, I. Tersiev, M. Belitova,
A. Kouizi, D. Damyanov**

**University Clinic of Surgery,
Section “Endocrine Surgery”**

**University Hospital “Queen Johanna” – ISUL
Medical University Sofia**



Central compartment

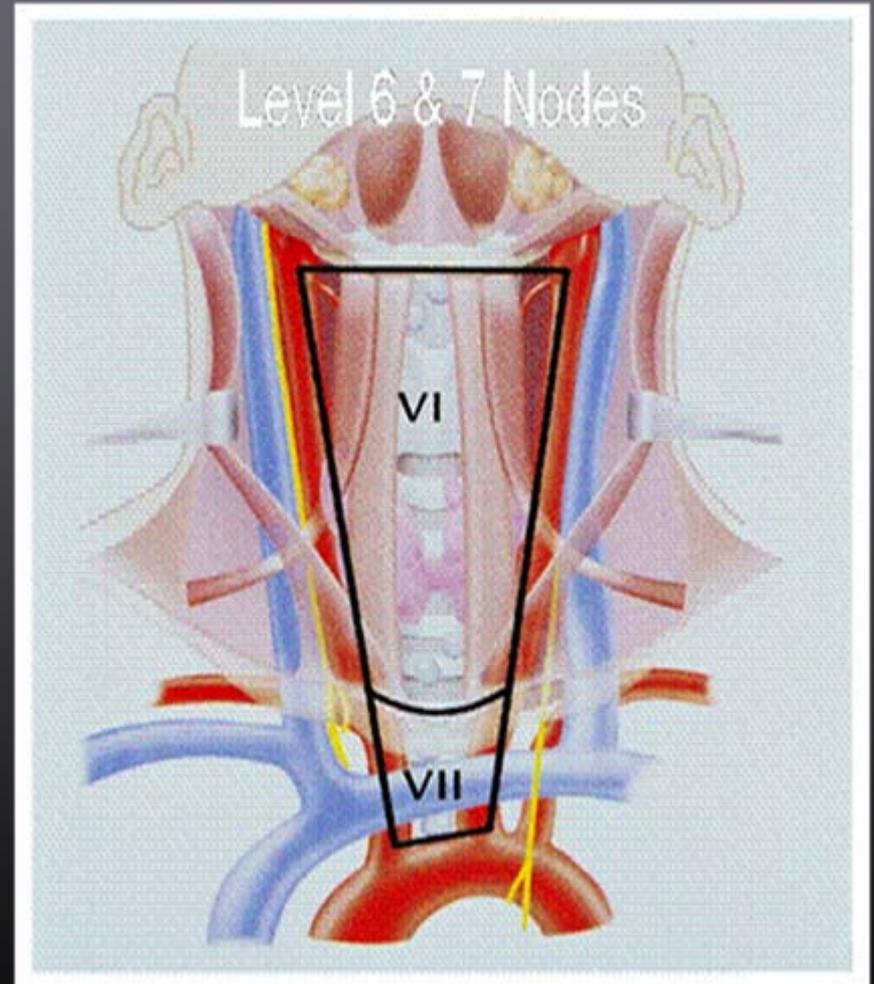
Common site of local metastases for thyroid carcinoma.

Reoperation - significant challenge even to the most accomplished surgeon.

Recurrence - is difficult to treat surgically and may become complicated

Central compartment lymph nodes

- are composed of:
 - perithyroidal,
 - pretracheal,
 - paratracheal,
 - prelaryngeal,
 - delphian,
 - tracheoesophageal,
 - and anterosuperior mediastinal nodes.
-
- trachea, Recurrent L Nerve, great vessels are located in the central compartment.



Surgical debate, in the management of thyroid cancer is the extent of surgery

- **Total vs near-total thyroidectomy**
- **Extent of associated lymph node dissection, particularly in (PTC)**
- **To improve staging, and to avoid complications related to reoperation, some surgeons advocate routine prophylactic CLND.**
- **Large retrospective studies have failed to identify LNMs as an important prognostic factor**

Reoperative central neck surgery

- **extent of central dissection**
- **therapeutic efficacy**
- **potential risks.**

Most thyroid carcinomas (75%-85%) are papillary thyroid carcinoma (PTC), which has an excellent overall prognosis!!

- It is important to compare the therapeutic effects of more or less aggressive CLND.
- More aggressive CLND, may increase the incidence of postoperative complications, including injury of the RLN and hypoparathyroidism

Clinical significance of central compartment differs, from that of the lateral compartment

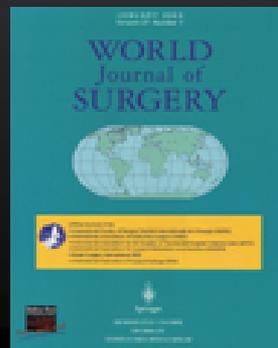
Frequency of lymph node metastasis in 759 patients with PTC to determine *whether and how such metastasis affects disease-free survival (DFS)*.

Central node metastasis was observed in 63% of patients, and the frequency was increased in relation to tumor size

On multivariate analysis of cases showing tumor larger than 1 cm, *central node metastasis was recognized as an independent prognostic factor of DFS*

Clinical Significance of Lymph Node Metastasis of Thyroid Papillary Carcinoma Located in One Lobe

World Journal of Surgery 2006 Y. Ito, T. Jikuzono, T. Higashiyam et al.



Clinical significance of the central compartment

The most frequent LNMs - are in the central compartment, especially in the side ipsilateral to the tumor, followed by the ipsilateral compartment.

- Metastatic spread to the contralateral and mediastinal compartments is uncommon and late.
- Is central neck dissection a safe procedure in the treatment of PTC? Our experience.
- Langenbeck's Archives of Surgery 2008, Volume 393,
- Number 5, 693-698; N. Palestini, A. Borasi, L. Cestino, et al

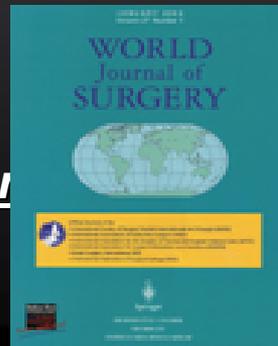
Pattern of Nodal Metastasis for Reoperative Thyroid Cancer

- ***Distribution of Nodal Metastasis of Compartments by pT Category for Reoperative Thyroid Carcinomas***

PTC- the ipsilateral cervicolateral compartment was involved almost as often as the cervicocentral compartment (21% vs. 37%)

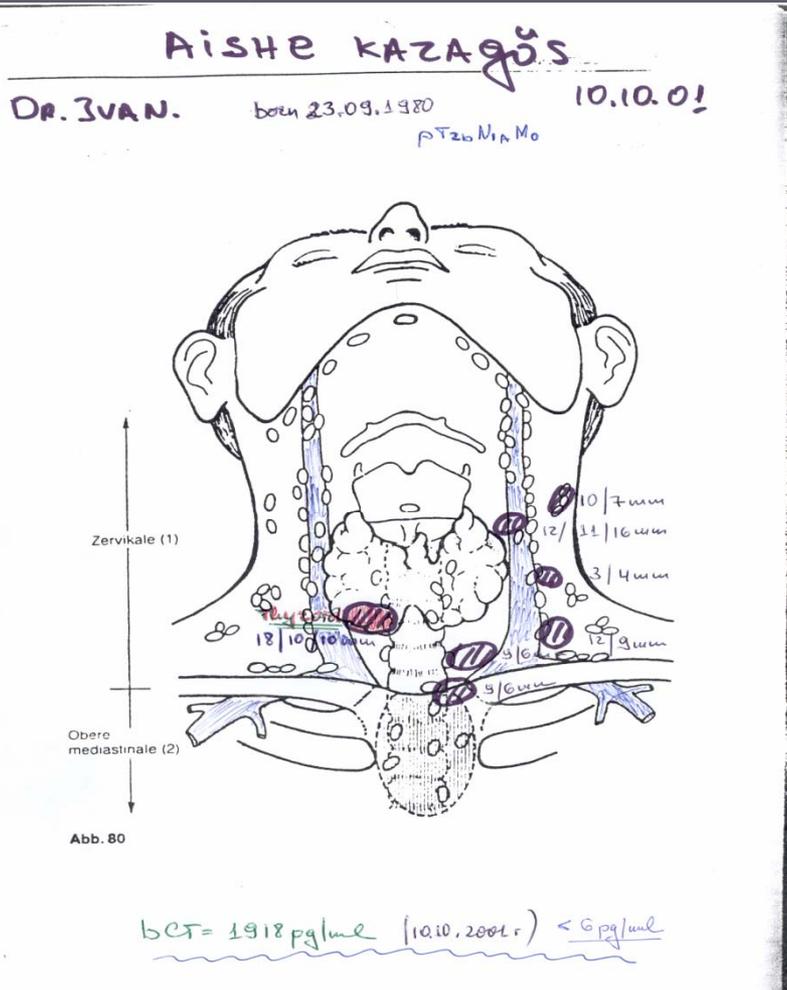
MTC - the cervicocentral compartment was affected more often than the ipsilateral cervicolateral compartment (65% vs. 49%).

Pattern of Nodal Metastasis for Primary and Reoperative Thyroid Carcinomas
World J. Surg. 26, 22–28, 2002; A. Machens, R. Hinze, O. Thomusch,



Preoperative Diagnosis of persistent / recurrent TC

Ultrasonography, MRI, CT, I131 WBS?



Preoperative Diagnosis Ultrasonography

When used before a subsequent operation for PTC, US had a **true-positive rate of 56.7%**, a true-negative rate of 13.8%, a false-positive rate of 3.7%, and a false-negative rate of 6.0%.

- **US displayed 90.4% sensitivity, 78.9% specificity, 93.9% positive predictive value, and overall 87.9% accuracy.**
- *Value of Preoperative Ultrasonography in the Surgical Management of Initial and Reoperative Papillary Thyroid Cancer.*
- *Arch Surg. 2006;141:489-496; John M. Stulak; Cl. Grant, D. Farley, et al.*

Reoperative central neck surgery

“nodes don't matter” ???

Indications: include primary thyroid cancer recurrence and/or metastases to the paratracheal and mediastinal lymph nodes

Technically: more difficult because of presence of scar tissue and disruption of normal anatomy, **greater risk of injury** to RLN and parathyroid glands

Staff: Experienced thyroid surgeons *with knowledge of surgical techniques.*

Reoperative central neck surgery

Should be followed an algorithm ?

Goal: safe and effective removal of recurrent / persistent disease.

This algorithm should include:

- systematic review of prior operative notes, pathology notes, and imaging studies - for localization of disease,
- understanding of reoperative central neck anatomy,
- appreciation for disease behavior

Reoperation for recurrent / persistent well-differentiated thyroid cancer

Otolaryngol Clin North Am. 2010 Apr;43(2):353-63, Pai SI, Tufano RP

Reoperative central neck surgery

Surgical Technique - our experience

Microdissection

technique: using optical magnification and bipolar coagulation

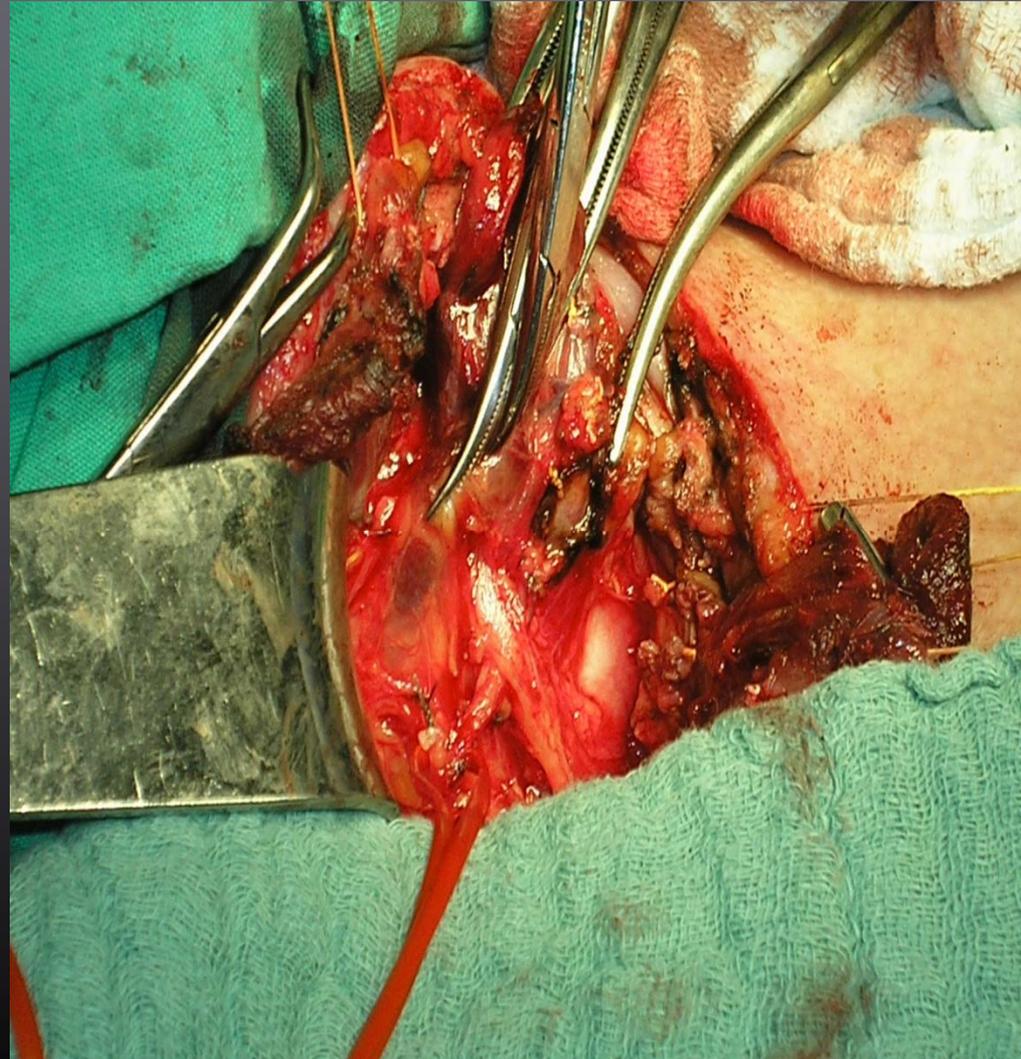
- Kocher incision-
extended laterally for adequate exposure,
- (but not along the sternocleidomastoid muscle)



Reoperative central neck surgery

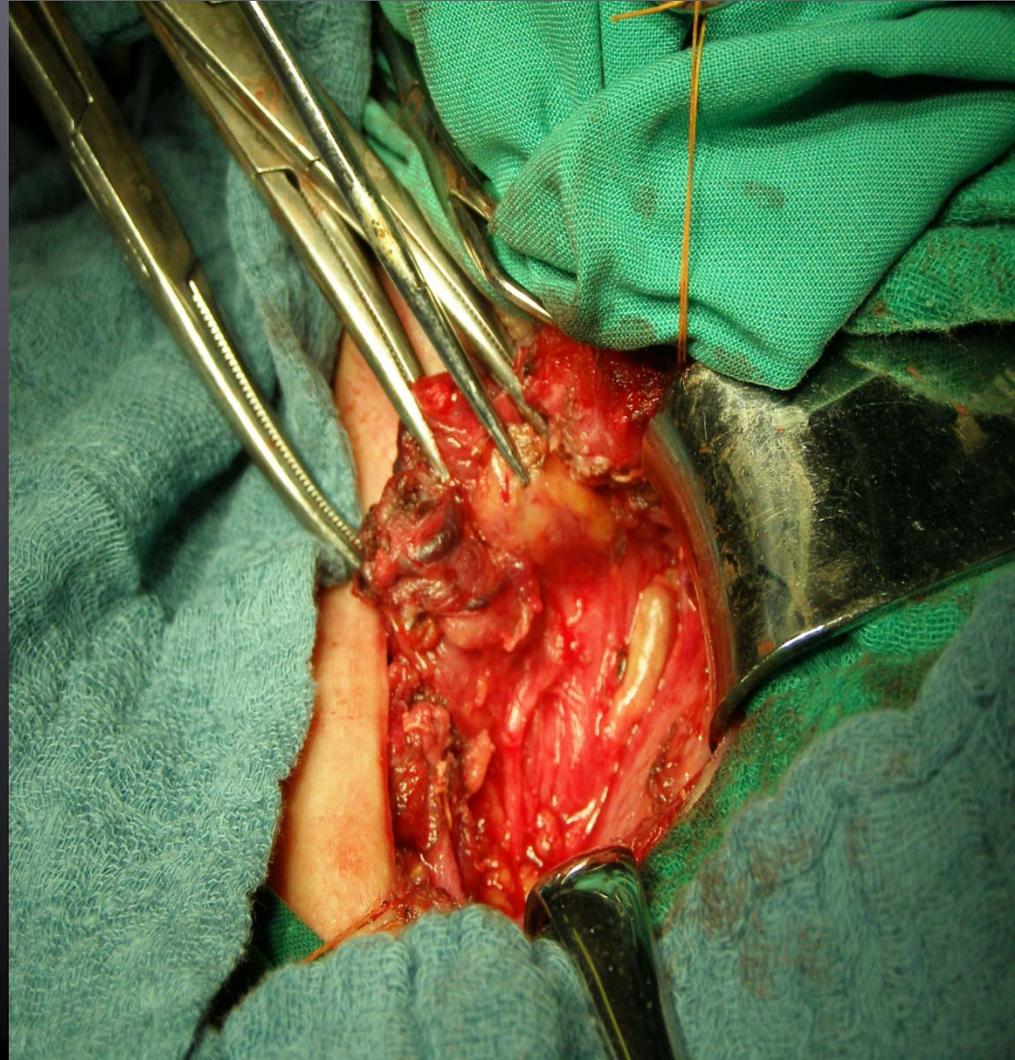
Surgical Technique - our experience

- The LRNs were identified
- where they cross the inferior thyroid artery and were exposed upwards until their insertion in the larynx.
- In the CND procedures, one or both LRNs were prepared caudally until the mediastinum.



Reoperative central neck surgery Surgical Technique- our experience

- The parathyroid glands were preserved in situ with their vascular pedicle.
- Transcervical Thymectomy was performed only when radical excision was required



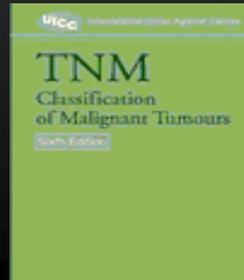
Therapeutic effects of surgical treatment

Patients were considered **disease-free** if during **follow-up** thyroglobulin levels were undetectable, and I131 scintigraphy during TSH stimulation, was negative .

Postoperative follow-up for recurrent PTC **increasingly includes** thyrotropin-stimulated thyroglobulin and high-resolution ultrasonography (US).

This combination commonly can detect recurrent disease as small as 5 mm.

Staging of patients was in accordance with the 6th edition of the TNM system.



Complication rates

Reoperative CLND is an uncommon operation with associated morbidity!

Incidence of permanent RLN paralysis -

ranging from 1% to 12%

Visual or Neuro-monitoring,

Meticulous surgical dissection,

Additional surgical strategies – were used to decrease injury to the RLN:

- identification of each nerve low in the tracheoesophageal groove distant from the thyroid bed and
- an inferior-to-superior dissection during the CLND

Complication rates: Hypoparathyroidism

- Temporary hypoparathyroidism from 0.3% to 49.0%, in several large series
- Permanent hypoparathyroidism - from 0% to 13%.
- The specimen should be carefully examined for parathyroid tissue !!!
- Reimplantation of the parathyroid glands at the time of reoperative CLND – is of questionable viability
- fibrosis and multiple positive lymph nodes in the dissected specimen can make identification and confirmation of parathyroid tissue difficult.

Reoperative central neck surgery

Preoperative evaluation

- included
- **clinical history with complete physical examination,**
- **routine laboratory evaluation,**
- **cervical ultrasound** determination for neck lymph nodes,
- **fine needle aspiration biopsy (FNAB),**

Reoperative central neck surgery our experience (n=141)

Between 2002 and 2011 - 141 patients underwent central compartment reoperation for recurrent or metastatic thyroid cancer and completion TH

All patients had prior total-, subtotal- or hemithyroidectomy, and

27 patients had prior neck dissections

45 patients had received radioactive iodine therapy

5 months to 11 years prior to their reoperation for recurrent thyroid cancer.

Reoperative central neck surgery our experience (n=141)

- Completion thyroidectomy - in 56 cases (32 CLND) scheduled of ≥ 3 months, after primary surgery
- Primary recurrence in thyroid bed- in 12 patients (7 CLND)
- Evidence of LND metastases - paratracheal or mediastinal in 65 patients
- Histology:
 - MTC in 21 patients,
 - FTC in 8 patients,
 - PTC in 112 patients
 - follicular variant of PTC in 33 patients,
 - tall cell variant PTC in 5 patients.

Reoperative central neck surgery our experience (n=141)

- full central compartment lymph node dissection (left and right thyroid beds) - performed in 34 patients
- a right CLND in 29 patients,
- a left CLND in 32 patients
- and node picking in 9 patients

- The mean number of lymph nodes removed was 9.0, and
- the mean number of positive lymph nodes was 4.7

- One experienced thyroid surgeons (RP) carried out all operations

Postoperative morbidity our experience (n=141)

- Of the **126 patients** with normal preoperative parathyroid function,
- **33 patients (26%)** developed transient postoperative hypocalcemia
- Permanent hypoparathyroidism - 4 (3.2%) patients
-
- Transient RLN palsy – 4 (3%) patients
- There was One case (0.7%) of permanent RLN injury

Follow-up (median 6 years) our experience (n=141)

- A total of 73 (52%) patients are currently living without evidence of disease after their reoperative CLND.
- 64 patients (45%) - alive with evidence of disease
- (14 MTC, 58 PTC)
- disease-specific mortality – 4 patients (3%)
- (1 FPTC, 3 MTC)

Diminishing the need for reoperation is important!!!

- At the initial surgical procedure - Complete removal of the primary thyroid cancer and involved regional lymph nodes will lessen the need for reoperation.
- On the other hand, large number of the patients underwent insufficiently extensive surgery

Does prophylactic CLND improve the prognosis of PTC patients?

JSTS/JAES	Routinely recommended
ATA <u>American Thyroid Association</u>	May be performed for T3 or T4 patients
BTA <u>British Thyroid Association</u>	Male gender, age >45 years, tumor size >4 cm, extracapsular or extrathyroidal disease
NCCN <u>National Comprehensive Cancer Network</u>	Can be considered for patients <15 years old or >45 years old, radiation history, distant metastasis, bilateral nodularity, extrathyroidal extension, tumor size >4 cm, and aggressive variant
AACE/AAES	Not recommended

Therapeutic Strategy for Differentiated Thyroid Carcinoma in Japan Based on a Newly Established Guideline Managed by JS Thyroid Surgeons and JA Endocrine Surgeons.

World Journal of Surgery (2011) 35: 111 – 121; H.Takami, Y. Ito, T. Okamoto et al.



Is additional Central Neck surgery recommended ?

- Large retrospective studies evaluating the prognostic factors have demonstrated that the presence of **lymph node metastases** in patients with PTC **is not associated with a decrease in survival**
- When factors - age and vascular invasion are controlled, the presence of **lymph node metastases** lead to **an overall decrease in survival**.
- Lymph node metastases have been associated with an increased **incidence of locoregional recurrence**
- There is no room for argument that therapeutic central node dissection **is mandatory**.

Conclusions

- **Adequate preoperative imaging** with **precise anatomical localization** - mandatory in the management of reoperative PTC patients

Meticulous surgical dissection with identification of the RLN and preservation of the parathyroid glands safeguards against injury to these structures.

- Of greater importance is the **surgeon's responsibilities** - Failure to excise the LNDs, reflects as **surgeon indifference** or as **surgeon inexperience**.