

Neck Nodes -Differentiated thyroid Cancer



thyroid cancer and neck nodes



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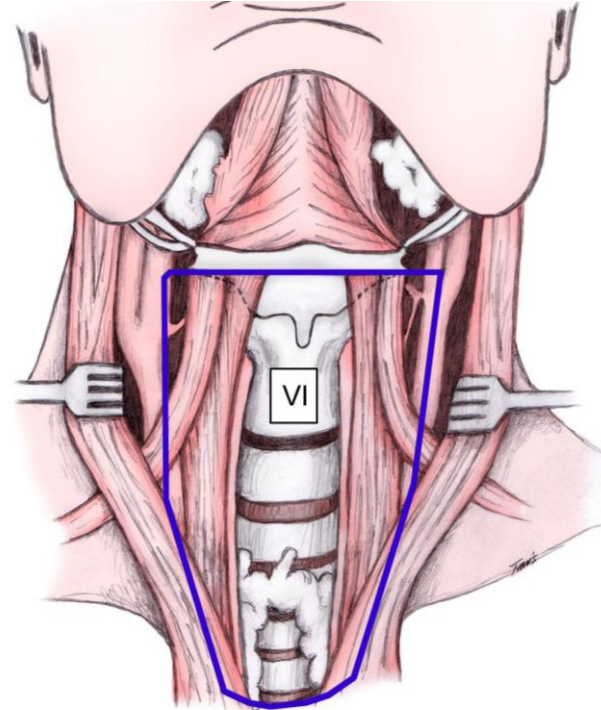
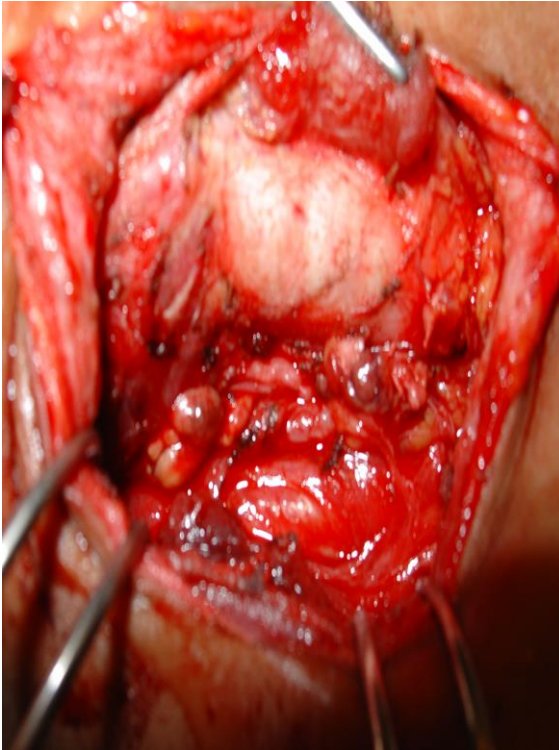
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American Thyroid Association Design and Feasibility
of a Prospective Randomized Controlled Trial
of Prophylactic Central Lymph Node Dissection
for Papillary Thyroid Carcinoma

- 7 year study, 4 years enrolment, 5 year follow up
- Recurrence rate 10% after 7 years
- 25% relative reduction in primary endpoint – newly identified structural disease (persistent, recurrent, distant)
- Annual drop out of 3%
- Total patient load needed would be 5840

Lymph Node metastasis Benefit vs Morbidity



Central compartment first echelon of nodal spread in 40-50 % cases

May be present even when nodule being small and intrathyroidal

Micrometastasis <2mm may approach 90% depending on detection method used

The accuracy of ultrasonography in the preoperative diagnosis of cervical lymph node metastasis in patients with papillary thyroid carcinoma: A meta-analysis[☆]

Lian-Ming Wu^a, Hai-Yan Gu^a, Xin-Hua Qu^b, Jasmine Zheng^c, Wei Zhang^a, Yan Yin^a, Jian-Rong Xu^{a,*}

European Journal of Radiology 81 (2012) 1798–1805

- A total of 13 studies, 1020 patients
- The pooled region- or node-based sensitivity for ultrasonography was 0.63, specificity was 0.93, and the AUC was 0.81
- N1a (central compartment): 5(397)
 - Sensitivity 0.45(0.40–0.51)
 - Specificity 0.72(0.71–0.78)
 - AUC 0.50

The Effect of Surgeon Experience on the Detection of Metastatic Lymph Nodes in the Central Compartment and the Pathologic Features of Clinically Unapparent Metastatic Lymph Nodes:

Thyroid 2014

- 47 patients node –ve well-differentiated PTC
- 1 senior surgeon & 1 resident assessed central compartment
- 26% false negative rate
- Size of the largest undetected node ranged from 0.1 to 1.3cm
- 42% of patients with occult metastases demonstrated 5 or more positive nodes
- 27% showed ENE.

Lymph node metastasis – Survival

- SEER database 9904 patients: age > 45 yrs, DM, large tumour size- poor survival (82% vs 79% N+ vs N-)¹
- SEER database lymph node metastasis decreases survival in >45 yrs and follicular carcinoma²
- SEER and NCDB: small but increased risk even in <45 yrs, increasing node involvement and those > 6 nodes³

1. *Am Surg* 71:731–734

2. *Surgery* 144:1070–1077

3. *J Clin Oncol* 33:2370–2375

Nodes risk of loco regional recurrence

	Risk of Recurrence –avg (range)
Clinically N0 , pN0	4 % (0- 9%)
Clinically N0 ,microscopic pN1	6 % (4-11.5 %)
No. of nodes <=5	4 % (3-8 %)
No. of nodes > 5	19 % (7-21%)
Nodes with extranodal extension	24% (15-32 %)

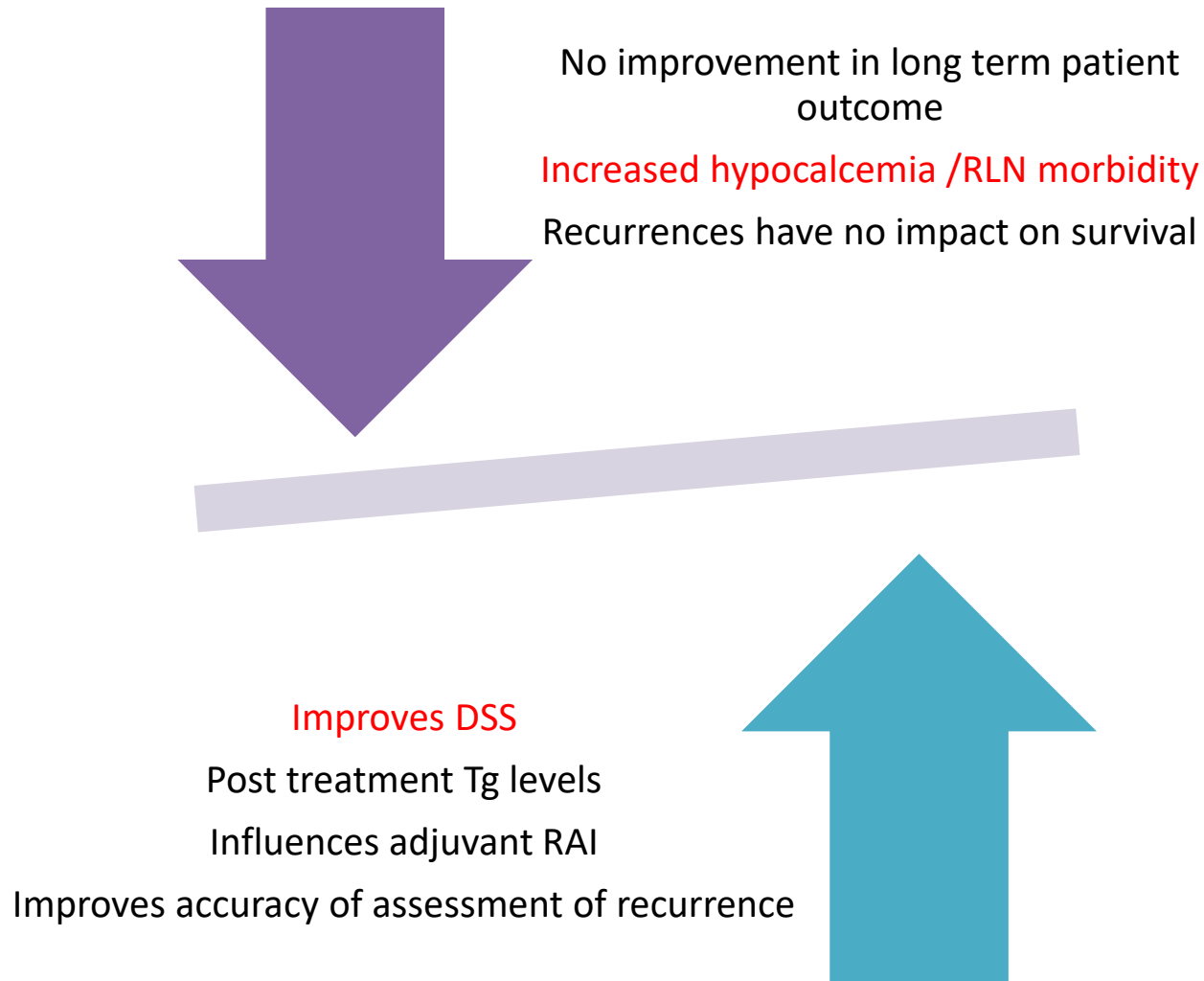
Observation of clinically negative central compartment lymph nodes in papillary thyroid carcinoma

Iain J. Nixon, MB, ChB,^a Ian Ganly, MD, PhD,^a Snehal G. Patel, MD,^a Luc G. Morris, MD,^a
Frank L. Palmer, BA,^a Dorothy Thomas, BA,^a R. Michael Tuttle, MD,^b Jatin P. Shah, MD, PhD,^a
and Ashok R. Shaha, MD,^a *New York, NY*

Surgery 2013;154:1166-73

- 1,129 patients had total thyroidectomy (1986 – 2005)
- 470 pN1; 384 had benign nodes removed (pN0); and the remaining 275 had no nodes removed (pNx)
- Median follow up 70 months
- 10-yr disease-specific survival was 100%
- 4 RAI scan +ve treated with RAI, 3 lateral neck recurrence and had surgery, 1 Tg suspicious of recurrence and 1 had a subcentimetric node suspicious and observed
- Rate of structural recurrence in the central neck was 0.4% (1/275), and the rate of reoperation on the central neck was 0

Pros & Cons of Prophylactic Central Dissection



Central compartment clearance

Meta analysis	Survival outcomes	Morbidity	Conclusion
Chrisholm et al (2009)	-	Higher rate of temporary hypocalcemia	No increase in permanent morbidity
Zetoune et al (2010)	CND does not reduce the recurrence	-	No benefit over TT
Shan et al (2012)	Identical locoregional control (LRC)	Temporary hypocalcemia with CND	TT results in less surgical morbidity with same LRC
Lang et al (2013)	Reduced risk of LRR	Higher temporary hypocalcemia	LRR risk reduction could be due to high RAI or selection bias
Wang et al (2013)	Trend towards lower recurrence	No diff in long term complication	Safe in high volume centres

Laryngoscope. 2009 Jun;119(6):1135-9
 Ann Surg Oncol. 2010 Dec;17(12):3287-93
 Laryngoscope. 2012 Apr;122(4):797-804
 Thyroid. 2013 Sep;23(9):1087-98
 Ann Surg Oncol. 2013 Oct;20(11):3477-83

Central Compartment Dissection - Indications

Node positive cases

Advanced primary tumours (T3 or T4)

Clinically involved lateral neck nodes (cN1b)

? What about low risk/ intermediate risk cases

ORIGINAL ARTICLE

Determinants of long-term quality of life in patients with differentiated thyroid carcinoma – a population-based cohort study in Sweden

Christel Hedman^{a,d}, Therese Djärv^b, Peter Strang^{c,d} and Catharina Ihre Lundgren^a

- 353 patients of thyroid cancers , 14–17 years after their diagnosis
- 134 (48%) had concerns related to recurrence
- QOL scores were significantly lower in patients with concerns of a recurrence
- Despite having excellent prognosis, **almost half of the patients, fully 15 years after diagnosis, worried about a recurrence which negatively impacted their HRQoL**

Performance of CT in the Preoperative Diagnosis of Cervical Lymph Node Metastasis in Patients with Papillary Thyroid Cancer: A Systematic Review and Meta-Analysis

 C.H. Suh,  J.H. Baek,  Y.J. Choi, and  J.H. Lee

AJNR Am J Neuroradiol. 2017 Jan;38(1):154-

- Nine eligible studies, including a total sample size of 1691 patients
- CT showed a summary sensitivity of 62% and specificity of 87% for diagnosing cervical lymph node metastasis
- The summary sensitivity of combined CT/ultrasound 69% was significantly higher than ultrasound 51%

Clinical risk factors for central lymph node metastasis in papillary thyroid carcinoma: a systematic review and meta-analysis

Hui Qu*, Guo-rui Sun*, Yao Liut and Qing-si He*†

Clinical Endocrinology (2015) 83, 124–132

25 studies, 7719 patients

	No. of studies	No. of patients	OR (95% CI)	P	I ²
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Age>45 years

PTMC	6	1315	0.59 (0.43–0.81)	0.001	38%
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Male

PTMC	8	1915	2.50 (1.48–4.22)	<0.001	73%
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Tumor multifocality

PTMC	8	2000	1.83 (1.49–2.25)	<0.001	0%
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Tumor size>0.5 cm

PTMC	6	1614	2.70 (1.79–4.06)	<0.001	37%
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Bilaterality

PTMC	4	354	0.86 (0.54–1.36)	0.52	0%
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Upper vs. lower lobe

PTMC	2	569	0.72 (0.19–2.72)	0.01	83%
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Lymphovascular invasion

PTMC	4	981	3.20 (1.89–5.43)	<0.001	0%
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Capsular invasion

PTMC	6	1609	2.09 (1.66–2.63)	<0.001	0%
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Extrathyroidal extension

PTMC	6	1272	2.96 (1.21–3.20)	0.007	45%
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Predictors of CC Nodes

N = 596

Overall positive 43%

Variable	Univariate p-value	Logistic Regression p-value
Age	<0.001	< 0.001
Gender	0.001	0.001
Size	0.87	0.349
ETE	0.001	<0.001
Pathology	0.001	<0.001
Focality	0.04	0.062

Efficiency of intraoperative frozen section analysis of central neck lymph node dissection in patients with papillary thyroid carcinoma

Mi Jin Kim, MD^{a*}, Cheol Seung Kim, PhD^a, Je ROUNG Kim, PhD^b, Young Sam Park, MD^a

- Medical records of 265 patients who underwent surgery for papillary thyroid cancer
- Patients were divided into 2 groups: IFSA and non-IFSA
- 74/83 patients (89%) in the IFSA group and 95/182 patients (52.2%) in the non-IFSA group

Frozen section	%
Sensitivity	93.5
Specificity	100
PPV	100
NPV	96.3
Accuracy	97.5

Logical Recommendation

Central-compartment neck dissection

Node positive cases

Advanced primary tumors (T3 or T4)

Clinically involved lateral neck nodes (cN1b)

Address central compartment if metastasis likely guided by (imaging /risk factors/ frozen)

The Evident Lateral Neck

presence of involved lymph nodes.

Lymph nodes in the lateral neck (compartments II–V, Fig. 3), level VII (anterior mediastinum), and rarely in level I may also be involved by thyroid cancer (282,335,377,378). For patients in whom nodal disease is evident clinically on pre-operative US and nodal FNA cytology or Tg washout measurement or at the time of surgery, surgical resection by compartmental node dissection may reduce the risk of recurrence and possibly mortality (379–381).

The Prognostic Significance of Nodal Metastases from Papillary Thyroid Carcinoma Can Be Stratified Based on the Size and Number of Metastatic Lymph Nodes, as Well as the Presence of Extranodal Extension

Gregory W. Randolph,¹ Quan-Yang Duh,² Keith S. Heller,³ Virginia A. LiVolsi,⁴ Susan J. Mandel,⁵ David L. Steward,⁶ Ralph P. Tufano,⁷ and R. Michael Tuttle⁸ for the American Thyroid Association Surgical Affairs Committee's Taskforce on Thyroid Cancer Nodal Surgery

- Nodal recurrences, The rule of 5 and 20
 - Clinically negative (cN0) – 4%
 - Micromets (Cn0, Pn1) – 6%
 - Macromets (Cn1) – 23%

Multivariate analysis – 544 patients

Independent predictors for level IIB metastasis

Factors	pvalue
T stage	.016
Level IV	.012
LVE	.034

Independent predictors for level V metastasis

Factors	pvalue
Level IV	.042

Levels of neck nodes

- Malignant lymph nodes are much more likely to occur in levels III, IV, and VI than in level II
- This may not be true for tumors arising in the upper pole of the thyroid, which have a higher propensity to demonstrate metastases to levels III and II (295)

Conclusions

- High incidence , limitations of preoperative assessment
- No significant impact on outcomes except for large & multiple nodes
- Balance morbidity with need, surgical expertise important
- Use ancillary data to help guide – high risk within low risk, frozen, imaging , unilateral exploration

Thank you !