

Sommerschule SGORL 2017

Thema: Hals- und Gesichtschirurgie

Diagnostic and Treatment of the Neck

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Hals-Nasen-Ohrenklinik
Kantonsspital St. Gallen

Agenda

- Staging
- Risk factors for lymph node metastases
- Classification
- Treatment of the N+ neck
- Neck dissection after primary chemoradiation
- Treatment of the N0 neck
- Results of neck treatment
- Neck dissection in salivary gland carcinomas
- Neck dissection in skin cancer
- Neck dissection in thyroid cancer
- Neck dissection in melanoma

Suggested reading

- Medina J et al. Management of the Neck in Head and Neck Cancer, Part I. The Otolaryngologic Clinics of North America, Vol. 31, Number 4, 1998
- Medina J et al. Management of the Neck in Head and Neck Cancer, Part II. The Otolaryngologic Clinics of North America, Vol. 31, Number 5, 1998
- Robbins TK et al. Consensus Statement on the Classification and Terminology of Neck Dissection. Arch Otolaryngol Head Neck Surg 2008;134(5):536-538
- Ferlito A et al. Proposal for a rational classification of neck dissections. Head Neck 2011;33(3):445-50
- Broglie MA et al. Occult metastases detected by sentinel node biopsy in patients with early oral and oropharyngeal squamous cell carcinomas: Impact on survival. Head Neck. 2012 May 18. doi: 10.1002/hed.23017. [Epub ahead of print]
- Stoeckli SJ, Broglie MA. Sentinel node biopsy for early oral carcinoma. Curr Opin Otolaryngol Head Neck Surg. 2012 Apr;20(2):103-8
- Buck G, Huguenin P, Stoeckli SJ. Efficacy of neck treatment in patients with head and neck squamous cell carcinoma. Head Neck 2008 Jan;30(1):50-7

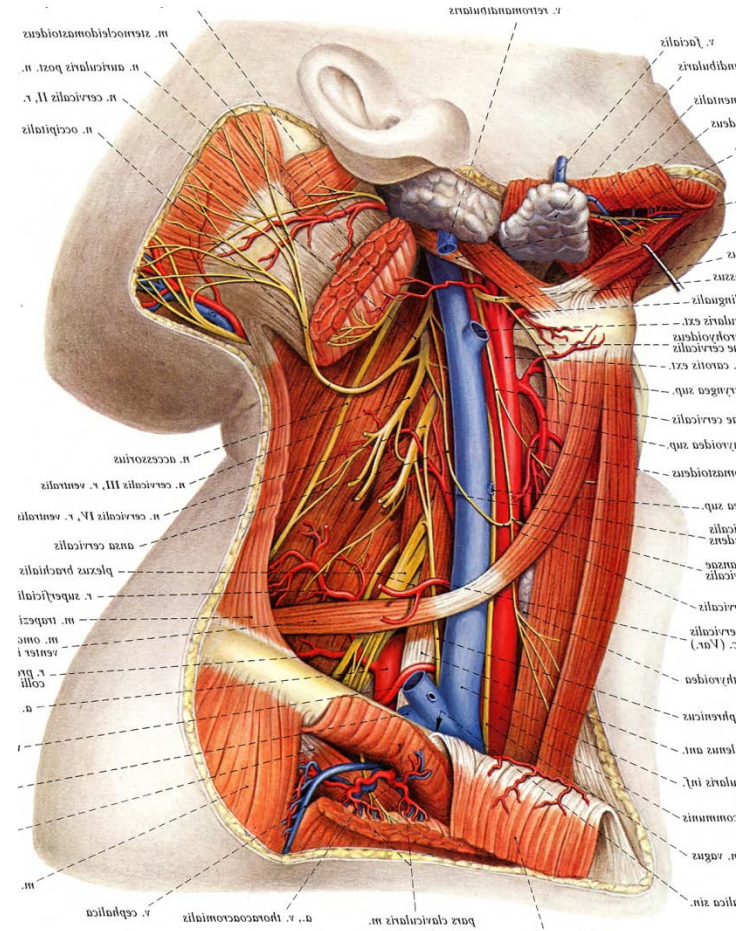
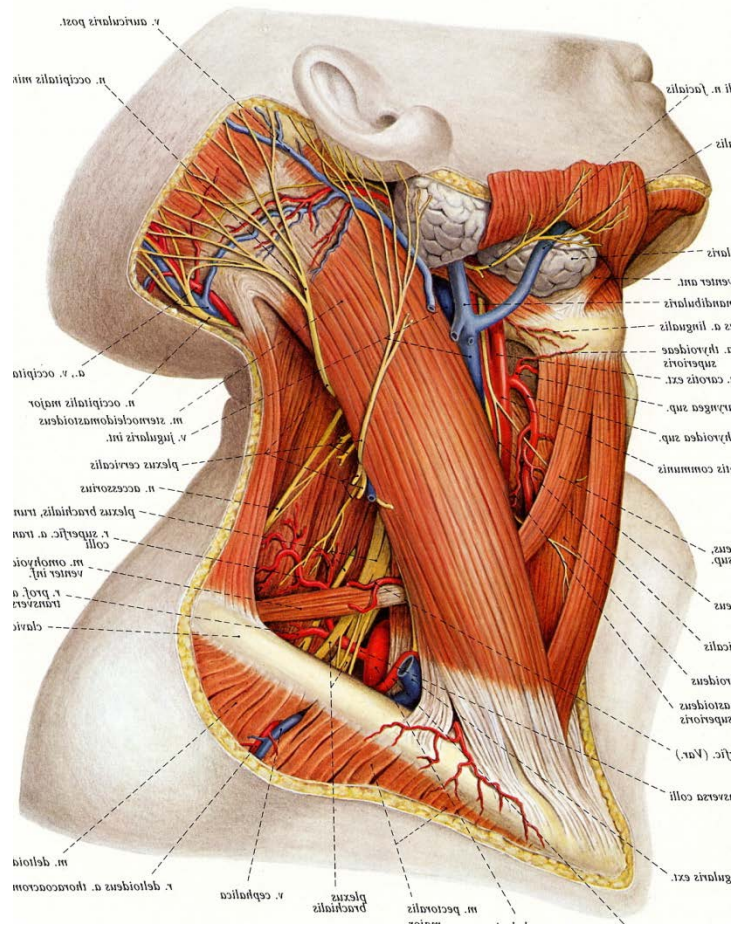
Staging

- Sensitivity and specificity of palpation approx. 60 – 70 %
- cN includes adequate imaging
- CT – US – MRI – PET/CT
- Imaging modality determined by primary tumor
- Criteria for malignancy critical for sensitivity and specificity
 - CT: LN>1cm (Level II>1.5cm), central necrosis, peripheral enhancement, extranodal spread
 - US: FNAC! Round shape, size, no hilus
- The higher the sensitivity, the lower the specificity

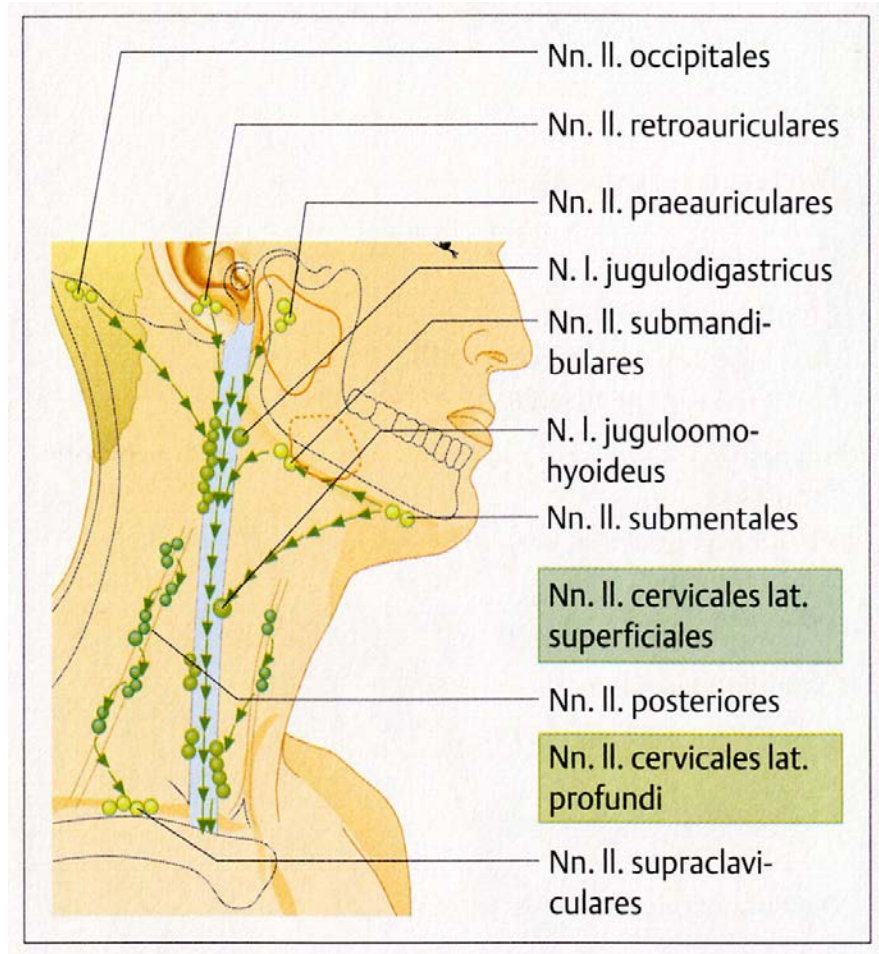
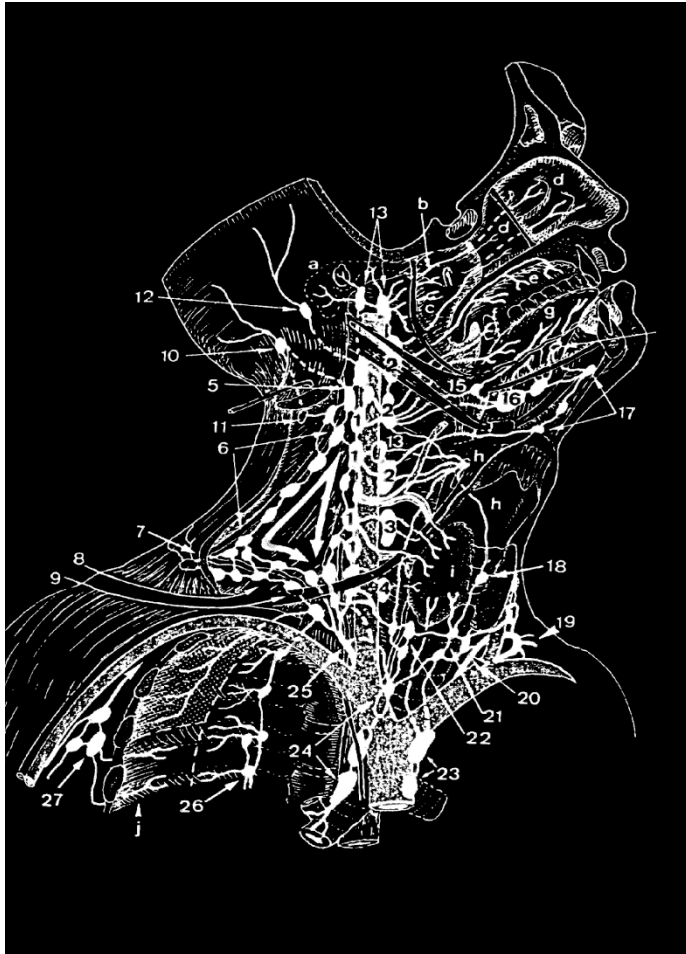
Risk factors

- Localisation of the primary tumor
- Tumor size
- Grading
- Tumor thickness
- Infiltration depth
- Perineural Infiltration
- Mode of invasion
- Lymphangiosis carcinomatosa
- Molekular markers

Anatomy

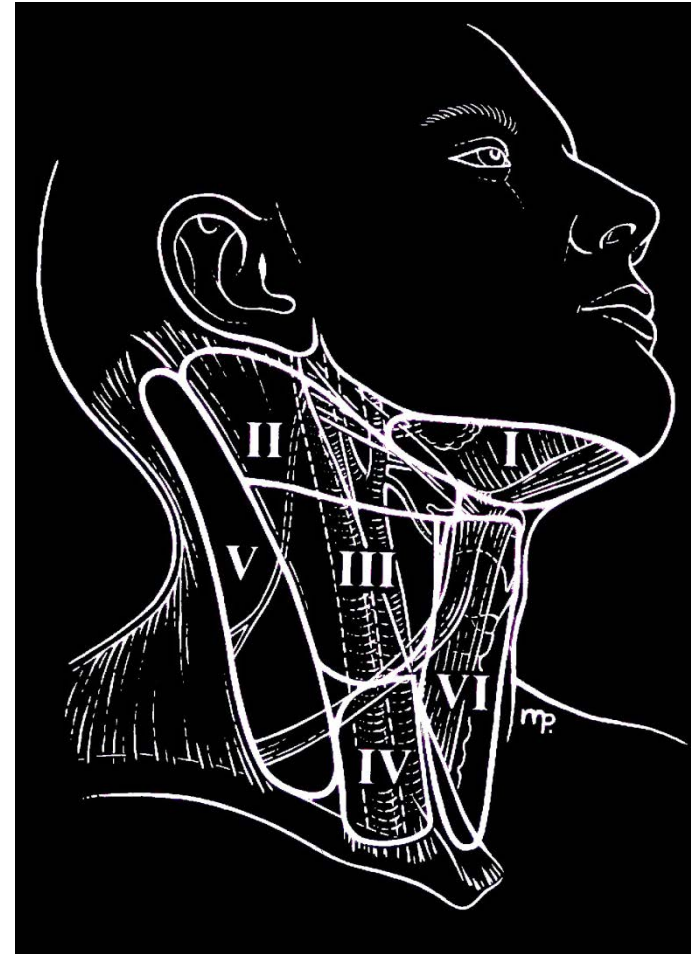


Lymphatic drainage



Classification

- Concept of risk levels
- MSKCC/Robbins
- Risk levels
 - I-III for oral cavity
 - II-IV for oropharynx, hypopharynx, supraglottis, glottis T3/4
 - II-V for nasopharynx
 - VI for thyroid, subglottis, oesophagus



Classifikation Neck Dissection

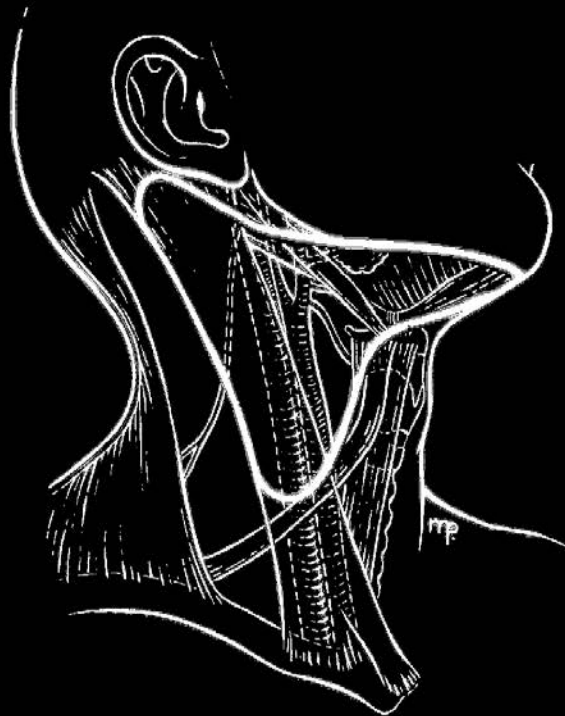
- cN0: prophylactic – selectiv – electiv
 - risk level according to primary tumor
- cN+: therapeutic - modified radical – radical –
Typ I – Typ II – Typ III
 - Level I-V
 - SAN, SCM, IJV

Classification Neck Dissection AAO-HNSF

- Radical Neck Dissection (I-V + XI,IJV,SCM)
- Modified Radical Neck Dissection (I-V)
- Selectiv Neck Dissection
 - Supraomohyoid Neck Dissection (I-III)
 - Lateral Neck Dissection (II-IV)
 - Posterolateral Neck Dissection (II-V)
 - Neck Dissection of the anterior/central compartment (VI)
- Extended Radical Neck Dissection

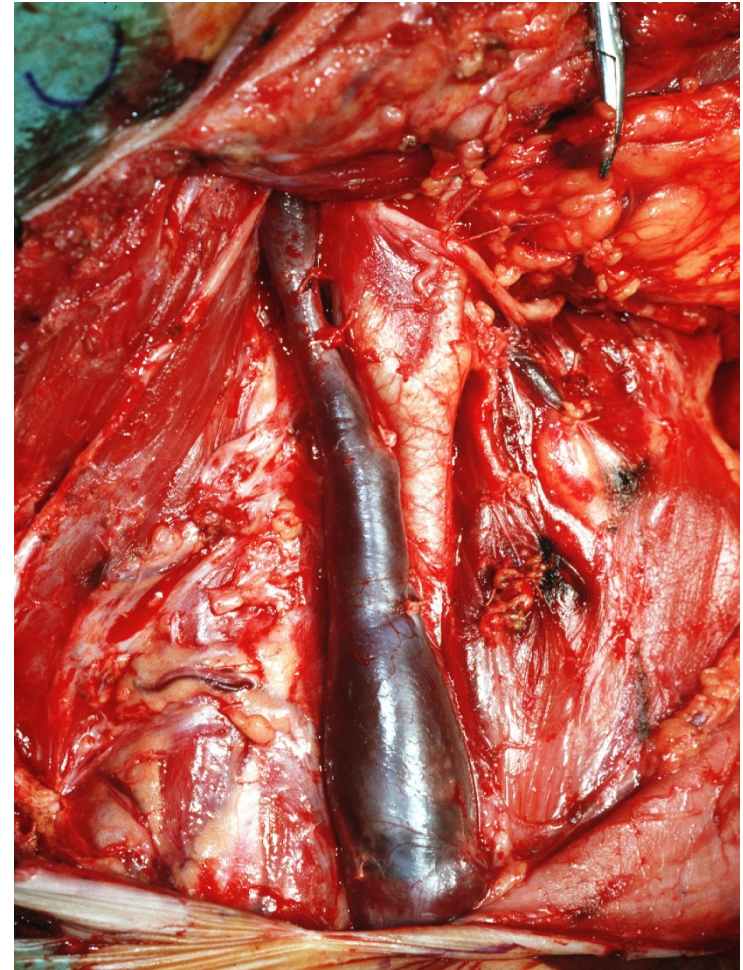
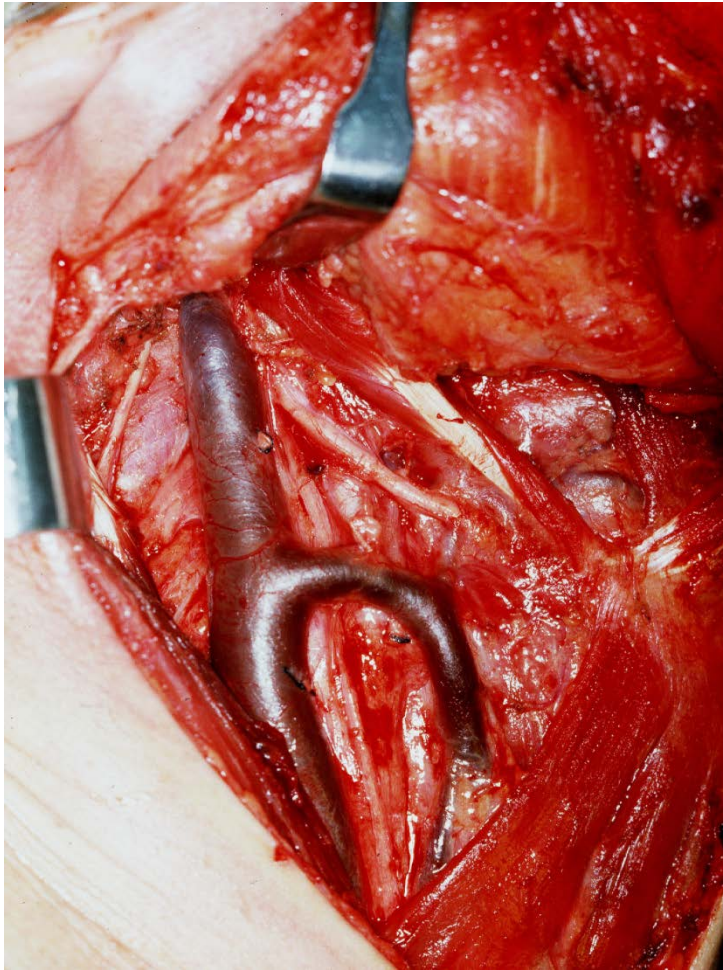
SELEKTIVE NECK-DISSEKTION

A Level I-III

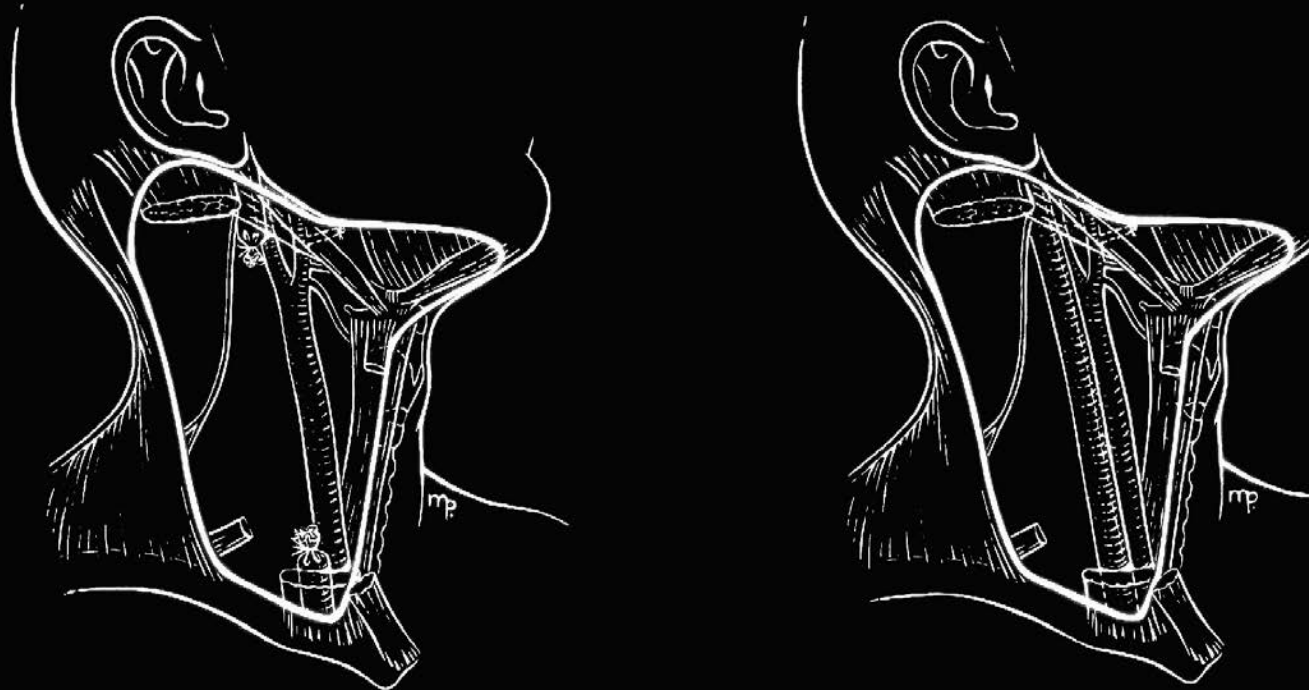


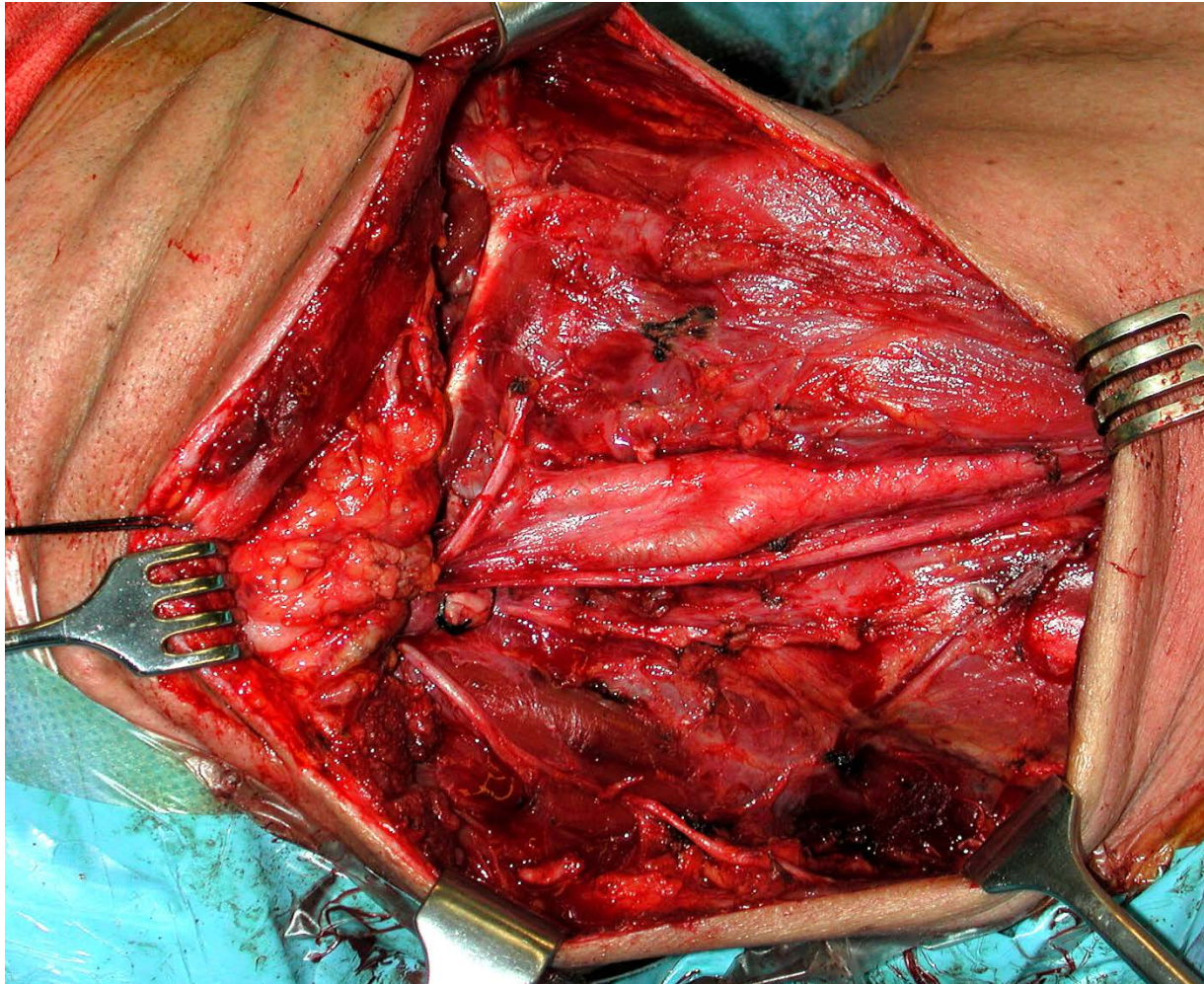
B Level II-IV



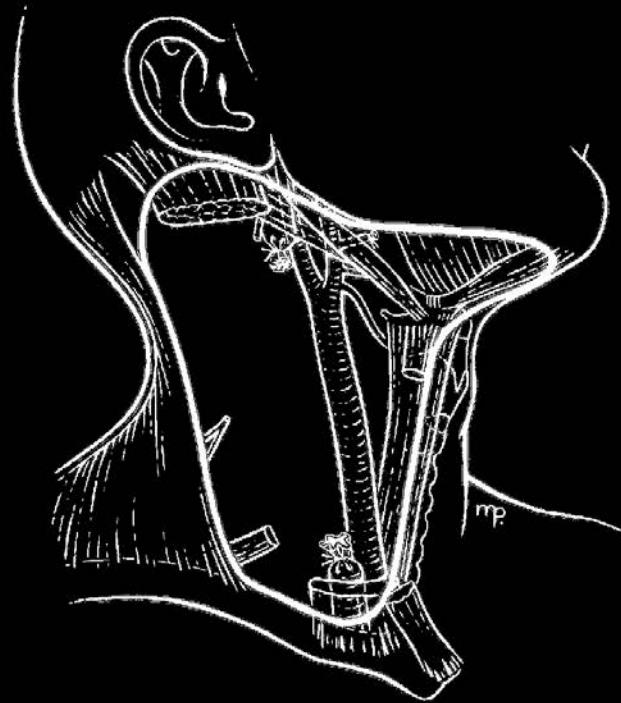


MODIFIZIERTE RADIKALE NECK-DISSEKTION





RADIKALE NECK-DISSEKTION



Proposed Classification of Neck Dissection

Proposed nomenclature	Nomenclature recommended by AAO-HNS/AHNS
ND (I V, SCM, IJV, CN XI)	Radical neck dissection
ND (I V, SCM, IJV, CN XI, and CN XII)	Extended neck dissection with removal of the hypoglossal nerve
ND (I V, SCM, IJV)	Modified radical neck dissection with preservation of the spinal accessory nerve
ND (II IV)	Selective neck dissection (II IV)
ND (II IV, VI)	Selective neck dissection (II IV, VI)
ND (II IV, SCM)	NA
ND (I III)	Selective neck dissection (I III)
ND (I III, SCM, IJV, CN XI)	NA
ND (II, III)	Selective neck dissection (II, III)
ND (IIA, III)	Selective neck dissection (IIA, III)
ND (VI)	Selective neck dissection (VI)
ND (VI, VII)	Selective neck dissection (VI, VII)

Abbreviations: AAO-HNS, American Academy of Otolaryngology Head and Neck Surgery; AHNS, American Head and Neck Society; ND, neck dissection; SCM, sternocleidomastoid muscle; IJV, internal jugular vein; CN XII, hypoglossal nerve; CN XI, spinal accessory nerve; NA, not available.

Note: Other suggested acronyms: SAN, spinal accessory nerve; ECA, external carotid artery; ICA, internal carotid artery; CCA, common carotid artery; CN VII, facial nerve; CN X, vagus nerve; SN, sympathetic nerve chain; PN, phrenic nerve; SKN, skin; PG, parotid gland; SG, submandibular gland; DCM, deep cervical muscles.

Ferlito A et al. Head Neck 2011

Therapy of the N+ neck

- Lymph node metastases are the most important prognostic factor
- N+ reduces the survival rate in the range of 50%
- Poor prognosis:
 - Multiple positive nodes
 - ECS
 - Involvement of level IV/V
- USgFNAC most accurate modality
- Treatment modality according primary tumor
 - Surgery: Neck dissection
 - Radiation or chemoradiation

Neck dissection in the N+ neck

- Traditionally level I – V, but more and more evidence for selective Neck Dissection in N+ neck
- Resect only infiltrated structures !
 - In particular CN XI !
- No need for en-bloc resection with primary tumor
- Bilateral neck dissection
 - Bilateral lymph node metastases
 - Primary tumor crossing the midline
- Postoperative RT
 - N2a, N2b, N3
- Postoperative RCT
 - ECS

Controversy of the cN0 neck

- Clinical staging for occult metastases achieves max. sensitivity of approx. 75%
- Size of micrometastases 0.2 - 2 mm
- occult metastases in approx. 30%
- Prophylactic treatment of the cN0 neck is standard of care

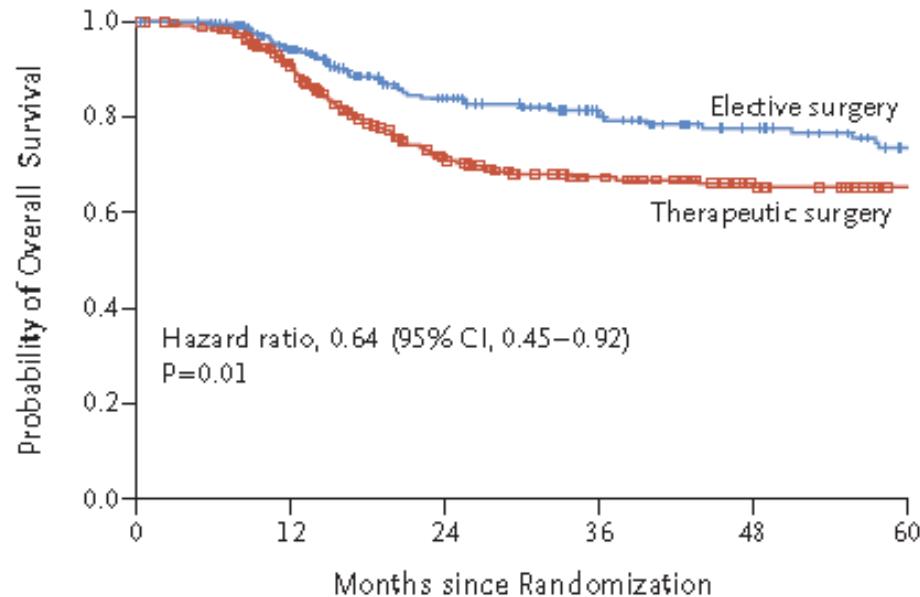
Standard of care for cN0 OSCC

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Elective versus Therapeutic Neck Dissection in Node-Negative Oral Cancer

Anil K. D'Cruz, M.S., D.N.B., Richa Vaish, M.S., Neeti Kapre, M.S., D.N.B.,
Mitali Dandekar, M.S., D.N.B., Sudeep Gupta, M.D., D.M.,
Rohini Hawaldar, B.Sc., D.C.M., Jai Prakash Agarwal, M.D.,
Gouri Pantvaidya, M.S., D.N.B., Devendra Chaukar, M.S., D.N.B.,
Anuja Deshmukh, M.S., D.L.O., D.O.R.L., Shubhada Kane, M.D.,
Supreet Arya, M.D., D.N.B., D.M.R.D., Sarbani Ghosh-Laskar, M.D., D.N.B.,
Pankaj Chaturvedi, M.S., F.A.I.S., Prathamesh Pai, M.S., D.N.B., D.O.R.L.,
Sudhir Nair, M.S., M.Ch., Deepa Nair, M.S., D.N.B., D.O.R.L.,
and Rajendra Badwe, M.S., for the Head and Neck Disease Management Group

A Overall Survival

No. at Risk						
Elective surgery	243	195	143	110	86	67
Therapeutic surgery	253	197	129	105	86	74

Panel A shows Kaplan–Meier estimates of overall survival and the corresponding hazard ratio in the elective-surgery group and the therapeutic-surgery group. At 3 years, the rates of overall survival were 80.0% (95% confidence interval [CI], 74.1 to 85.8) in the elective-surgery group and 67.5% (95% CI, 61.0 to 73.9) in the therapeutic-surgery group. There were

DFS: 69.5%

Elective Neck Dissection: n = 243

Therapeutic Neck Dissection: n = 253

Table 2. Pattern of Recurrence.

Recurrence	Elective-Surgery Group (N=81)	Therapeutic- Surgery Group (N=146)
	<i>number (percent)</i>	
Nodal*	25 (30.9)	108 (74.0)
Local	23 (28.4)	7 (4.8)
Distant metastasis	3 (3.7)	3 (2.1)
Combination of above†	4 (4.9)	8 (5.5)
Second primary tumor	16 (19.8)	11 (7.5)
Not known	10 (12.3)	9 (6.2)

- Nodal relapse
 - END: 10.3%
 - TND: 42.7%
- Local relapse
 - END: 9.5%
 - TND: 2.8%

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Elective versus Therapeutic Neck Dissection in Node-Negative Oral Cancer

Our study has some limitations. The distressing long-term complication of neck dissection is shoulder dysfunction, which occurs in a substantial proportion of patients.^{22,23} This complication was not addressed in our study. In this context, future studies should evaluate the role of procedures such as sentinel-lymph-node biopsy and limited neck dissection in reducing shoulder complications while preserving the rate of disease

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Elective versus Therapeutic Neck Dissection in Node-Negative Oral Cancer

Indication Postop RT

- Positives nodes
- DOI > 10mm
- R1
- PNI
- LVE

END

- N+ 72/243 = 29.6%
- R1 3/243 = 1%
- PNI/LVE 33/243 = 14%
- **PORT 139/243 = 57%**

Treatment options of the cN0 neck

- Wait and scan
 - USgFNAC
 - 20% failure rate in expert hand
 - Extensive salvage neck dissection because of advanced stage
 - Postoperative radiation because of advanced stage and ECS
- Selectiv neck dissection
 - Histologic staging
 - High control rate
- Primary radiation
 - No histologic staging
 - Control rate comparable to neck dissection
- Sentinel-Lymphnode-Biopsy
 - Select tumors
 - Most accurate histologic staging
 - High success rate

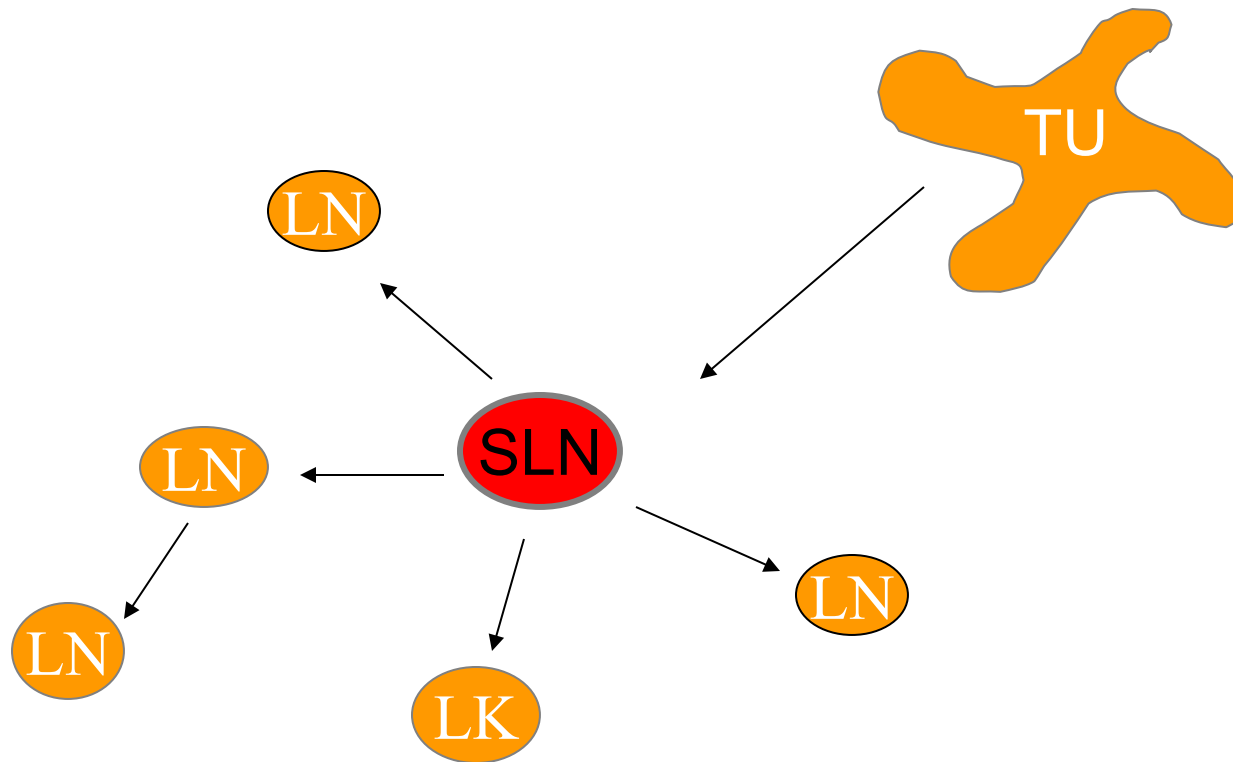
Sentinel Node Biopsy

- > 30 % occult metastases in elective neck dissection in cN0
- ~ 70 % overtreatment !
- Goals
 - Improve staging
 - Reduce morbidity/costs
 - Be equally effective as elective neck dissection

Concept of SLN biopsy

- Hypothesis:
 - SLN = first draining lymph node for a tumor of a specific site
 - all other lymph nodes are only reached subsequently
 - If metastases occur, they occur first in the SLN
- Goal:
 - localization and selective excision of the SLN
 - SLN tumor free → no neck dissection
 - SLN with tumor → neck dissection
- Principle:
 - ^{99}Tc labeled colloid mimicks lymphatic drainage of tumor cells

Concept of SLN biopsy



Indications for SNB

Primary site/TNM

Oral cavity T1/2

Oropharynx T1/2

Supraglottic Larynx

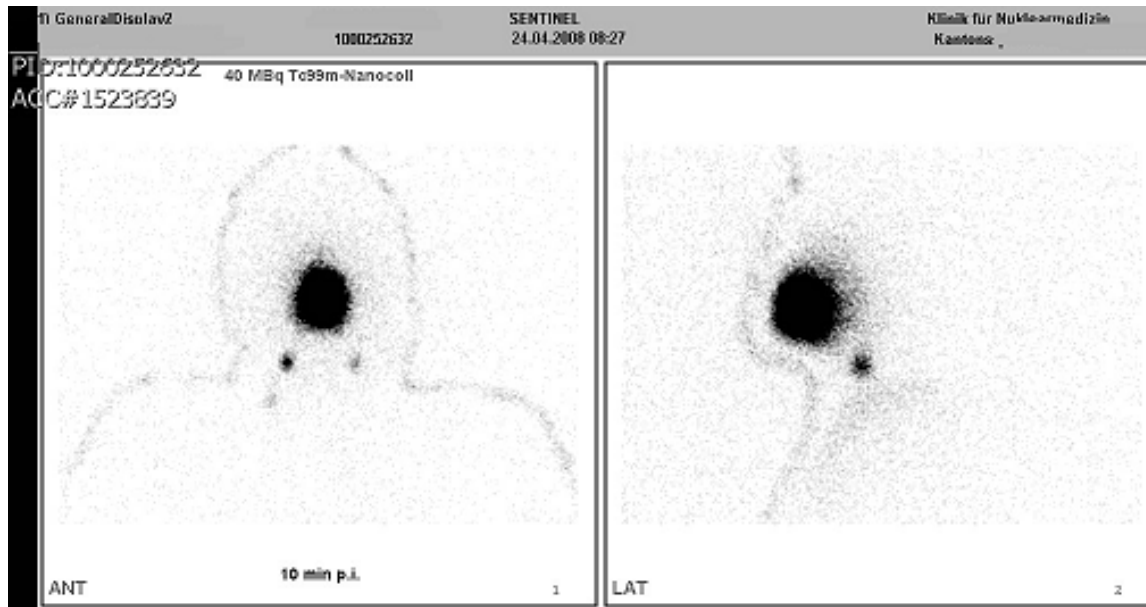
Hypopharynx

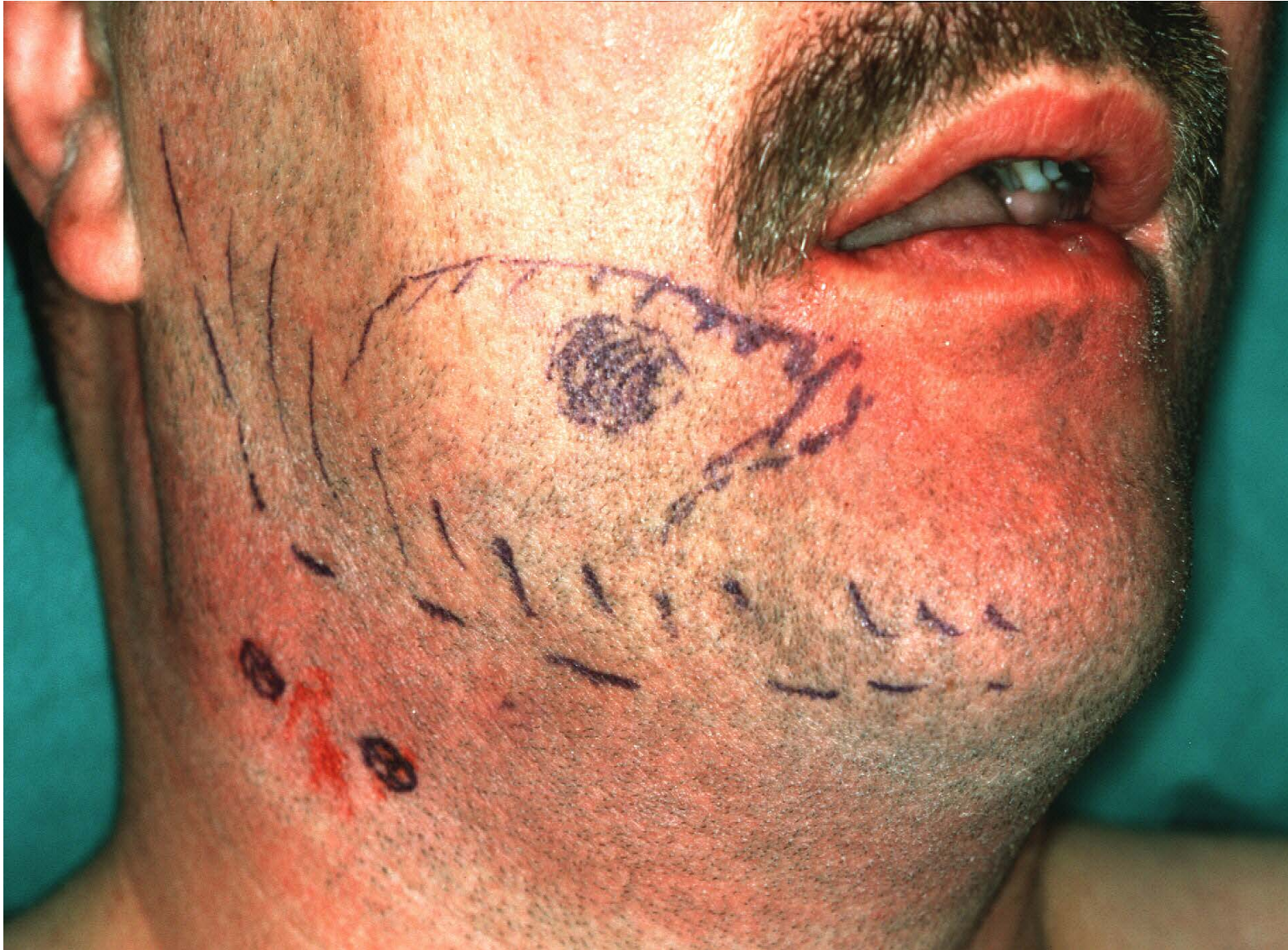


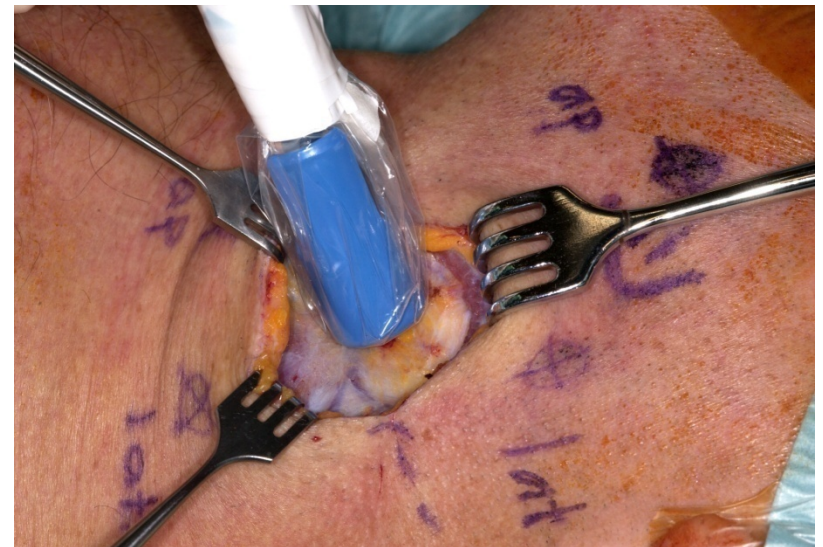
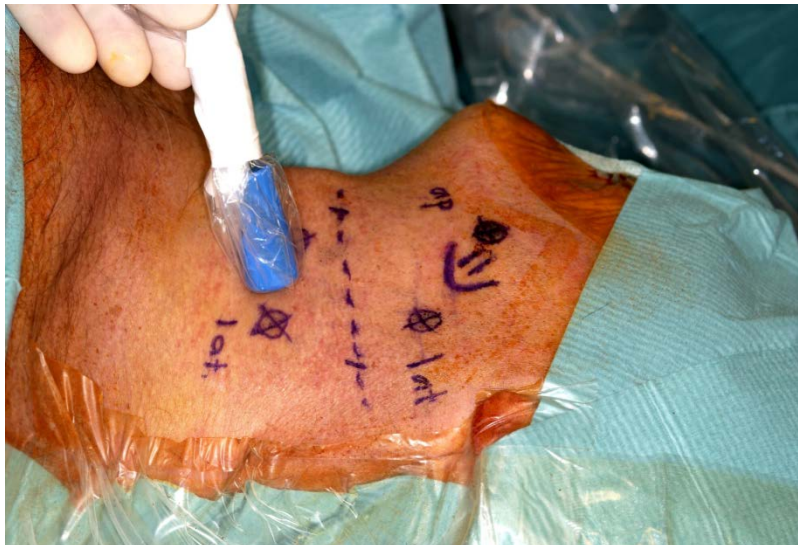
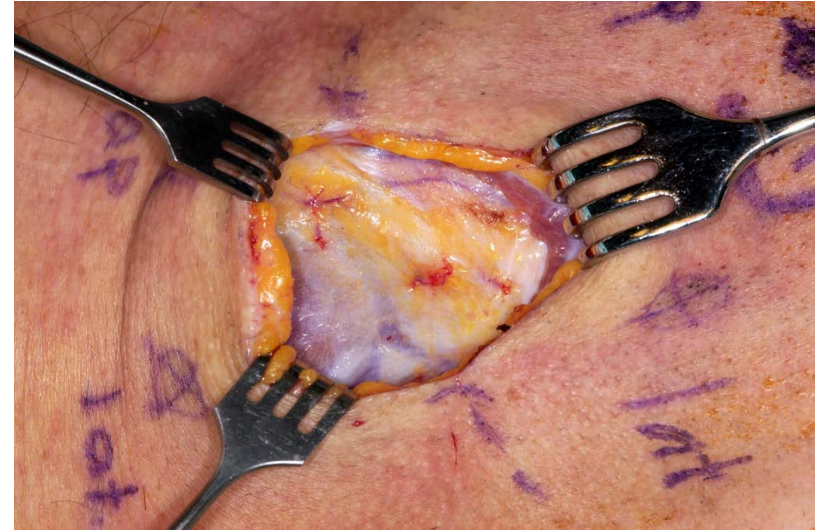
Lymphoscintigraphy

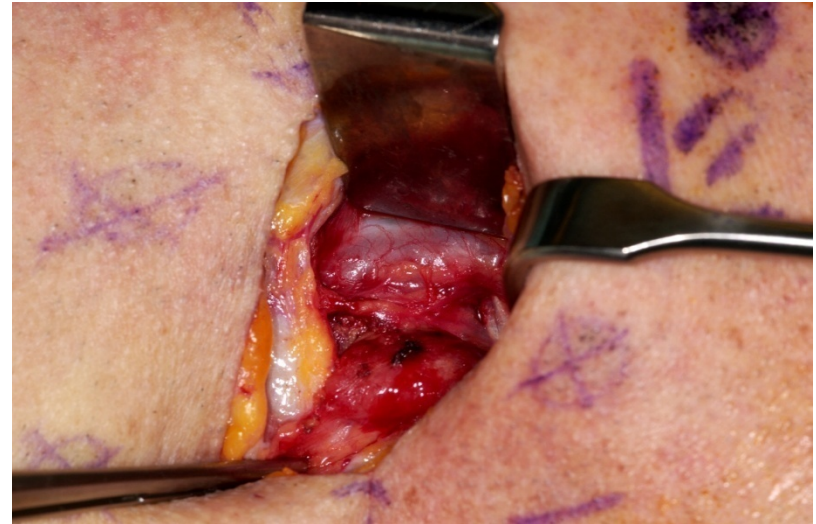
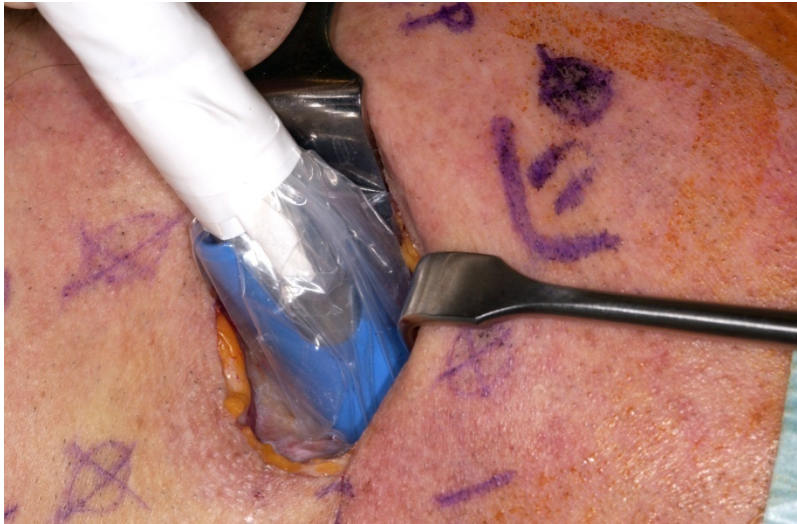
- Approximately 2 hours before surgery
- Peritumoral injection of 4 x 20 MBq ^{99m}Tc labeled colloid (Nanocoll^R)
- Dynamic imaging and static imaging
- Marking of the SLN on the skin surface
- SPECT/CT

SPECT/CT

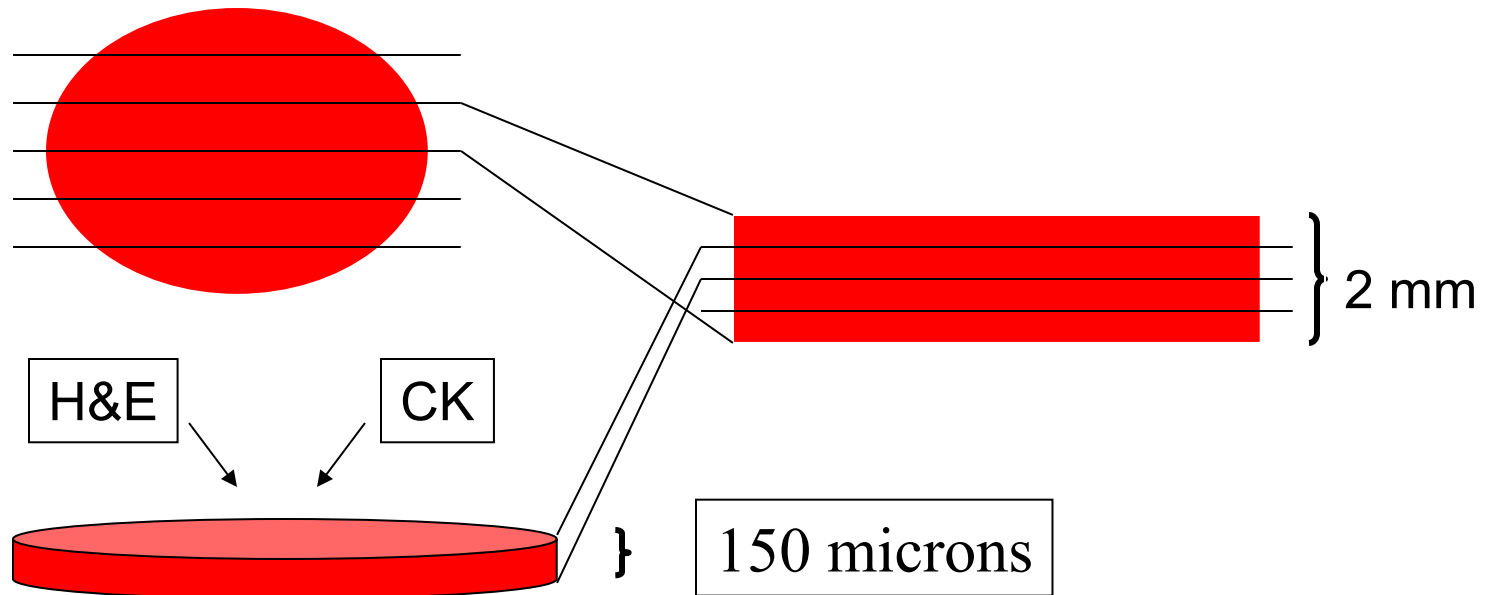








Histopathologic work-up

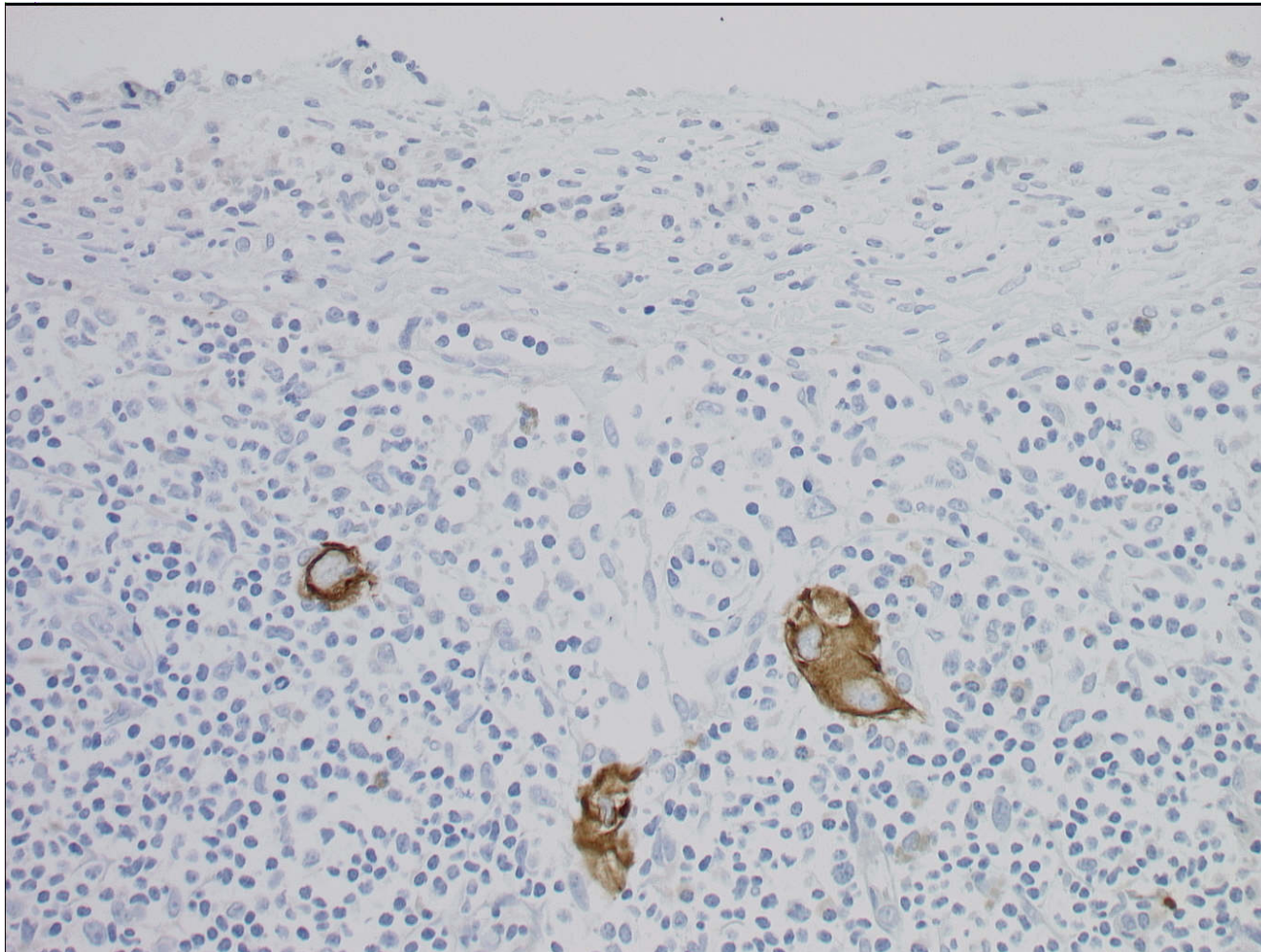


Occult Metastases

	Isolated tumor cells	Micrometastases	Macrometastases
Size	Single tumor cells or small clusters	Smaller than 2mm	Larger than 2mm
Contact with lymph sinus wall	Yes *	Yes	Yes
Invasion of lymph sinus wall	No	Yes	Yes
Extrasinusoidal stromal reaction	No	Usually yes	Usually yes
Extrasinusoidal tumor cell proliferation	No	Yes	Yes

Hermanek et al, 1990

ITC (CK)



ITC (H&E)



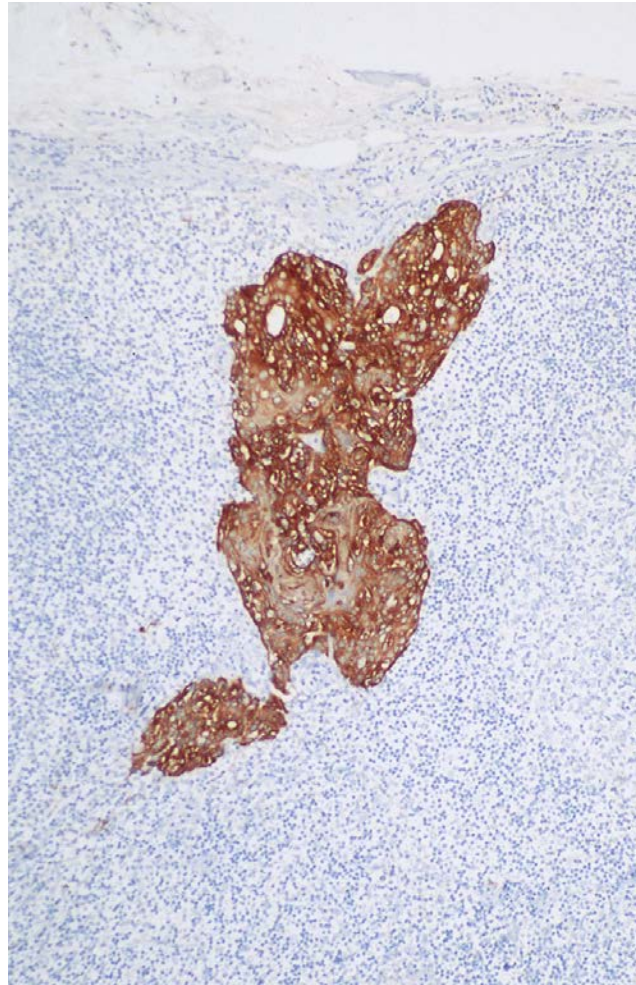
Detritus (CK)



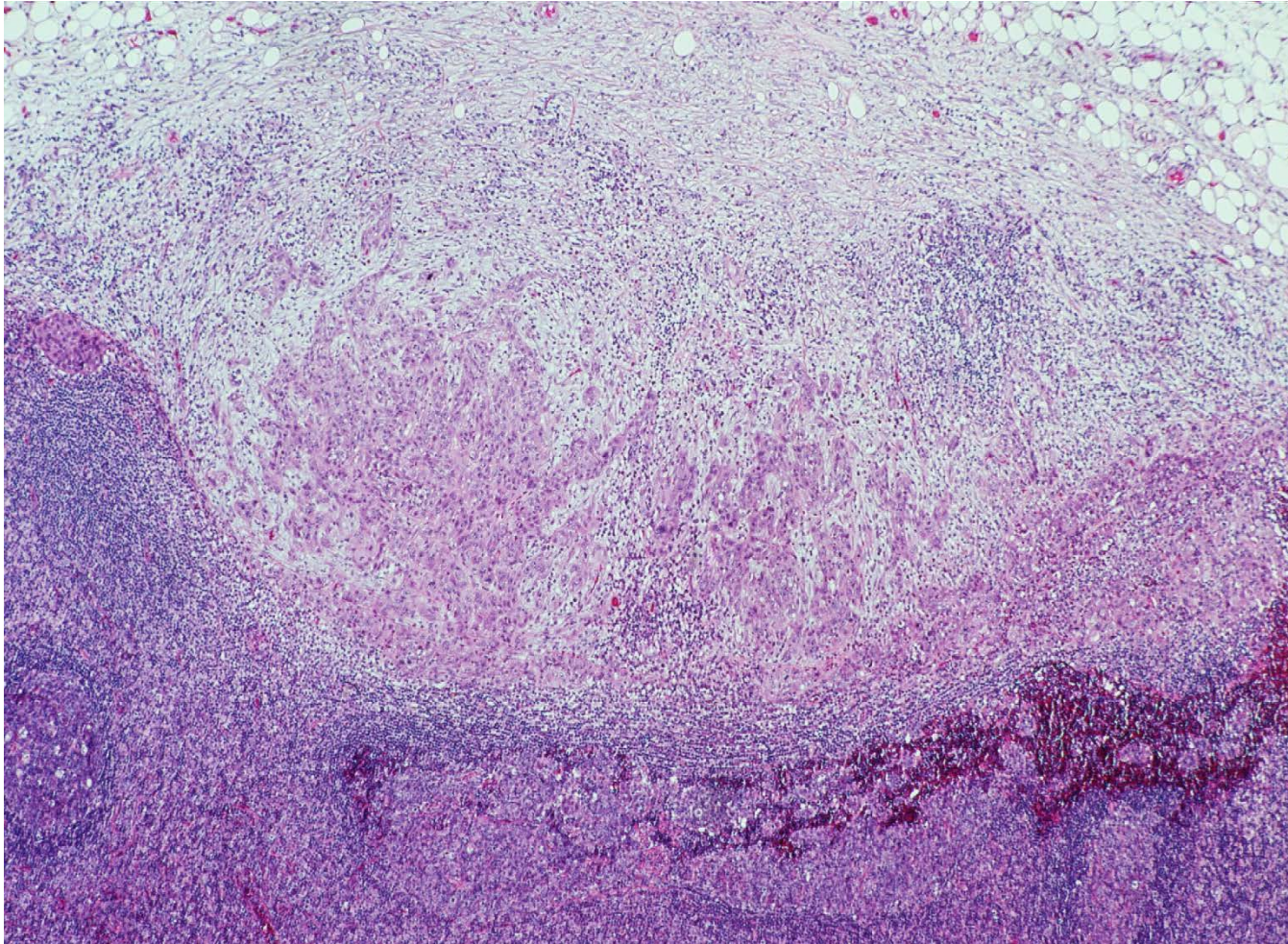
Detritus (H&E)



Micrometastasis



Macrometastasis with ECS



Validation in the context of END „Proof of Principle“

Annals of Surgical Oncology, 11(7):690–696
DOI: 10.1245/ASO.2004.09.001

Sentinel Node Biopsy in Head and Neck Cancer: Preliminary Results of a Multicenter Trial

Gary L. Ross, MD, David S. Soutar, ChM, D. Gordon MacDonald, FRCPath, Taimur Shoaib, FRCSEd, Ivan Camilleri, FRCS(plast), Andrew G. Robertson, PhD, Jens A. Sorensen, PhD, Jørn Thomsen, MD, Peter Grupe, MD, Julio Alvarez, MBBS, L. Barbier, MD, J. Santamaria, MD, Tito Poli, MD, Olindo Massarelli, MD, Enrico Sesenna, ChM, Adorján F. Kovács, PhD, Frank Grünwald, MD, Luigi Barzan, MD, Sandro Sulfaro, MD, and Franco Alberti, MD

VOLUME 28 • NUMBER 8 • MARCH 10, 2010

JOURNAL OF CLINICAL ONCOLOGY

ORIGINAL REPORT

Sentinel Lymph Node Biopsy Accurately Stages the Regional Lymph Nodes for T1-T2 Oral Squamous Cell Carcinomas: Results of a Prospective Multi-Institutional Trial

Francisco J. Civantos, Robert P. Zitsch, David E. Schuller, Amit Agrawal, Russell B. Smith, Richard Nason, Guy Petruzelli, Christine G. Gourin, Richard J. Wong, Robert L. Ferris, Adel El Naggar, John A. Ridge, Randal C. Paniello, Kouros Owzar, Linda McCall, Douglas B. Chepeha, Wendell G. Yarbrough, and Jeffrey N. Myers

From the University of Miami, Miami, FL;

The Laryngoscope
Lippincott Williams & Wilkins
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Rhinological and Otological Society, Inc.



CANDIDATE'S THESIS

Sentinel Node Biopsy for Oral and Oropharyngeal Squamous Cell Carcinoma of the Head and Neck

Sandro J. Stoeckli, MD

Survival

OS: N0 98% vs N+ 71%
($p = 0.003$)

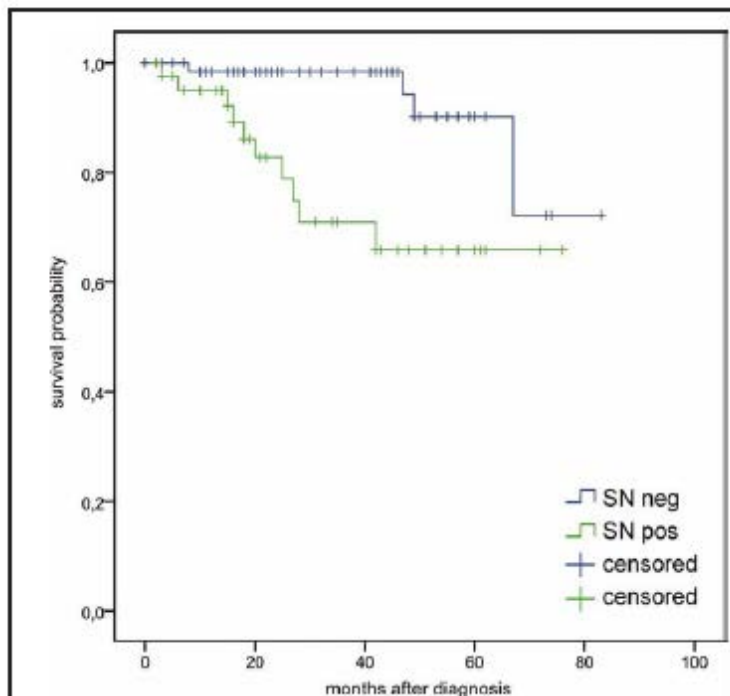


FIGURE 3. Overall survival in patients with sentinel lymph node (SLN)-negative and -positive tumors. [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]

DSS: N0 95% vs N+ 76%
($p = 0.001$)

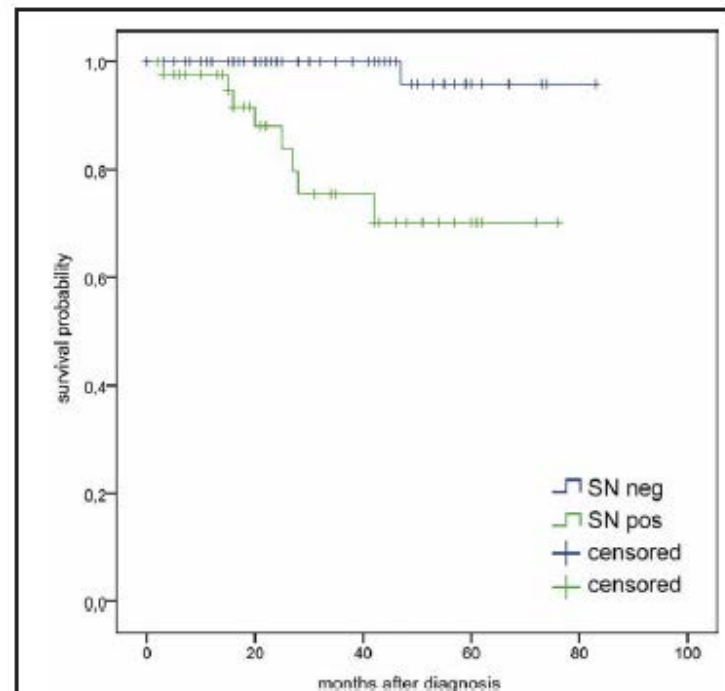
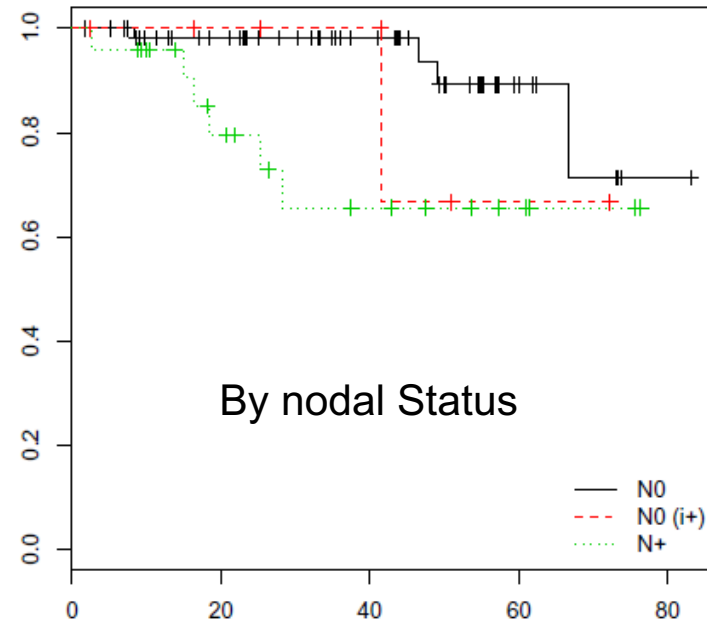
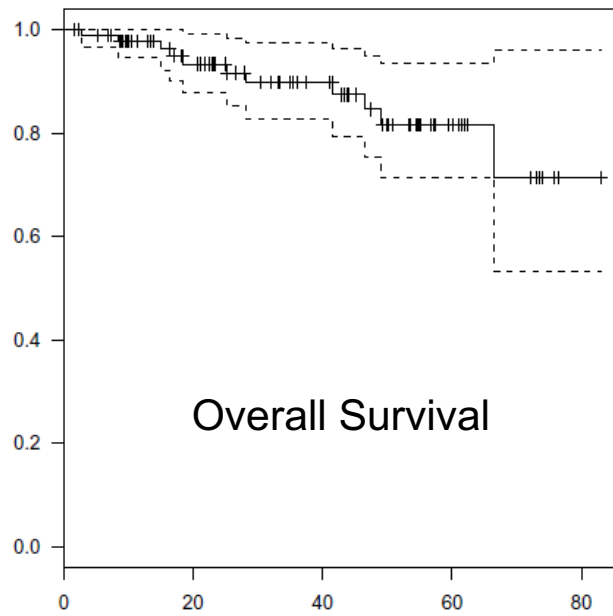


FIGURE 4. Disease-specific survival in patients with sentinel lymph node (SLN)-negative and -positive tumors. [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]

■ Overall survival (OS) at 5 years

- N0 89.2% (77.8-100%)
- N0 (i+) 66.7% (30-100%)
- N+ 65.6% (46.1-93.2%)



■ Disease-free survival (DFS) at 5 years

- N0 82.1% (70.0-96.3%)
- N0 (i+) 75% (42.6-100.0%)
- N+ 62.8% (44.9-87.7%)

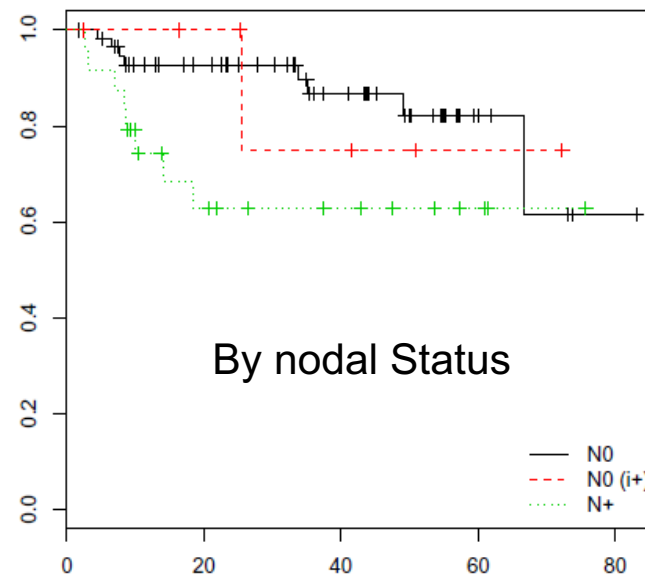
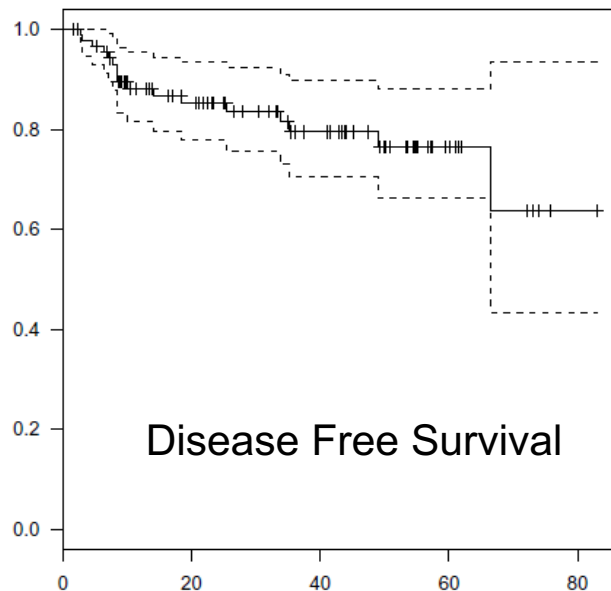


TABLE 1. Hazard ratio for overall survival, disease-specific survival, and disease-free survival.

Covariate	HR (95% CI)	<i>p</i> value
OS		
SLNB positivity	4.871 (1.523–15.576)	.008
ECS	7.980 (1.679–37.929)	.009
T classification	3.283 (1.099–9.805)	.033
Sex	1.474 (0.511–4.257)	.437
RT	1.376 (0.178–10.669)	.760
Tumor site	1.154 (0.683–1.951)	.593
Age	1.037 (0.992–1.083)	.110
DSS		
SLNB positivity	16.058 (2.004–128.640)	.009
ECS	13.295 (2.532–69.804)	.002
T classification	3.644 (0.910–14.588)	.068
RT	2.064 (0.255–16.709)	.497
Sex	1.523 (0.409–5.673)	.531
Tumor site	1.111 (0.568–2.175)	.759
Age	1.034 (0.97–1.091)	.227
DFS		
SLNB positivity	15.989 (1.996–128.007)	.009
ECS	13.274 (2.527–69.729)	.002
T classification	3.613 (0.902–14.467)	.070
RT	2.063 (0.255–16.701)	.497
Sex	1.538 (0.413–5.727)	.521
Tumor site	1.113 (0.568–2.182)	.755
Age	1.034 (0.980–1.092)	.222

Abbreviations: HR, Hazard ratio; OS, overall survival; DSS, disease-specific survival; DFS, disease-free survival; CI, confidence interval; SLNB, sentinel lymph node biopsy; ECS, extracapsular spread; RT, radiation therapy.

TABLE 2. Hazard ratio for overall survival, disease-specific survival, and disease-free survival of different size of metastases.

Covariate	HR (95% CI)	<i>p</i> value
OS		
ITCs	4.06 (0.73–22.55)	.109
Micrometastases	4.81 (1.28–18.08)	.02
Macrometastases	6.58 (1.32–32.75)	.02
DSS		
ITCs	10.1 (0.62–163.1)	.103
Micrometastases	16.26 (1.8–146.1)	.013
Macrometastases	19.49 (2.01–188.44)	.010
DFS		
ITCs	10.1 (0.62–163.1)	.103
Micrometastases	16.26 (1.8–146.1)	.013
Macrometastases	19.42 (2.0–187.8)	.010

Abbreviations: HR, Hazard ratio; OS, overall survival; DSS, disease-specific survival; DFS, disease-free survival; CI, confidence interval; ITCs, isolated tumor cells.

Rational for current indications

RESEARCH ARTICLE

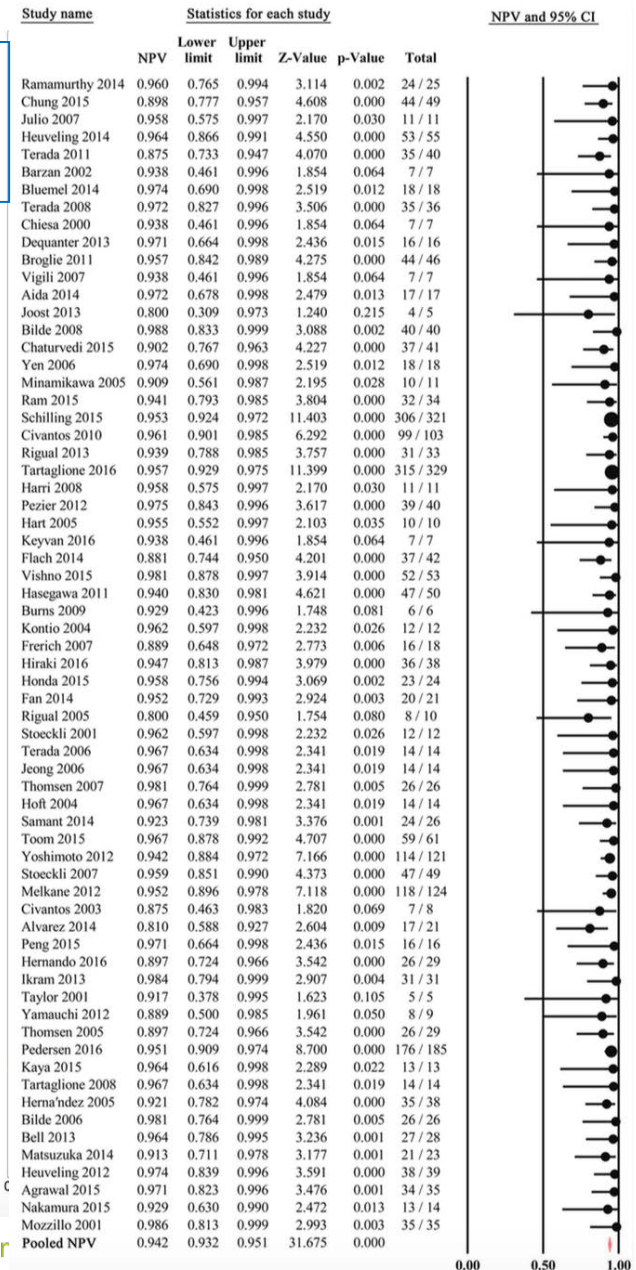
Diagnostic Efficacy of Sentinel Lymph Node Biopsy in Early Oral Squamous Cell Carcinoma: A Meta-Analysis of 66 Studies

Muyuan Liu¹*, Steven J. Wang²*, Xihong Yang¹, Hanwei Peng¹*

N= 3566 patients
Pooled SNB identification rate : 96.3%

Sensitivity 87%

NPV: 94%



Conclusion

- SNB for early oral and oropharyngeal SCC is feasible
- SNB is the most accurate staging procedure for the cN0
- SNB seems to be accurate in longterm follow-up of observational studies
- Occult metastases detected by SNB have impact on survival

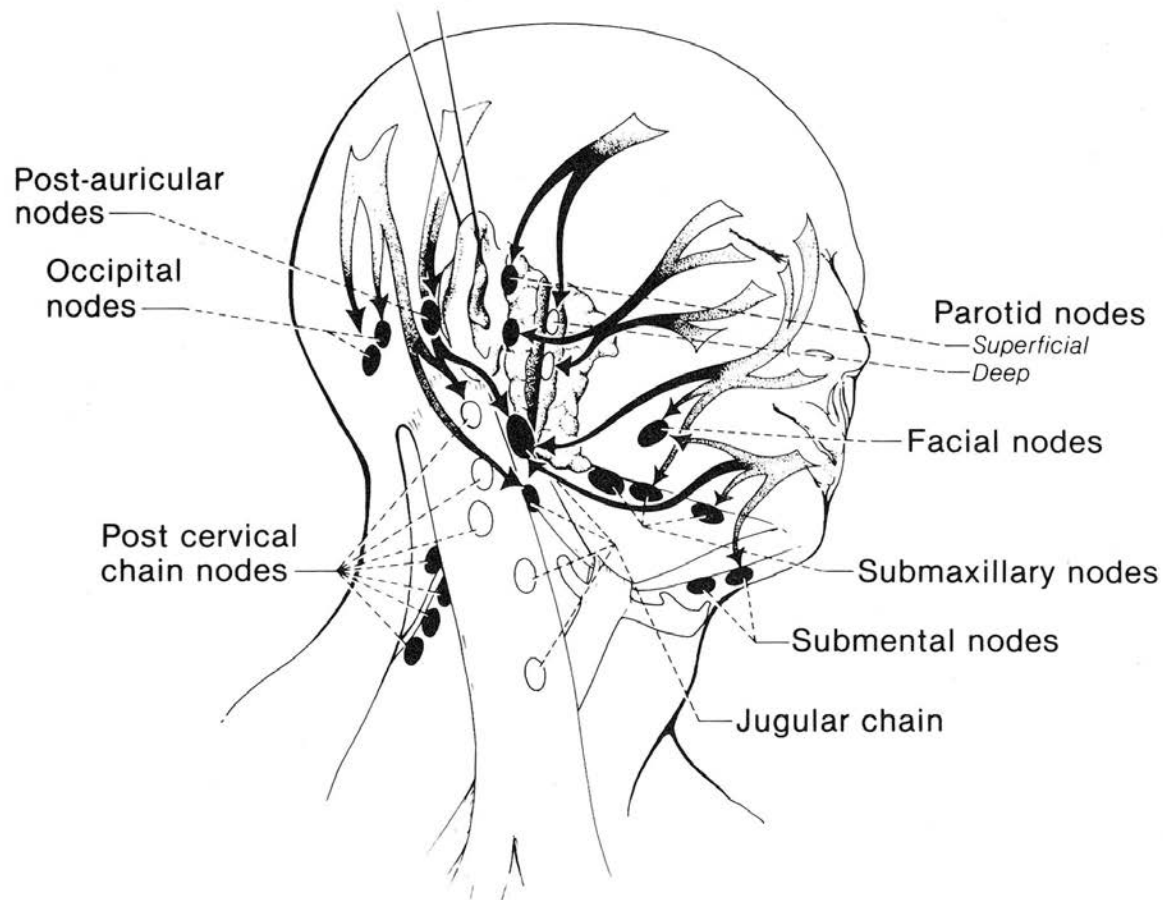
Neck dissection in salivary gland cancer

- Neck dissection in N+
- Adjuvant RT in N+
- N0 controversial
 - Neck dissection in large (T3/4) and/or high grade tumors
 - Alternatively: RT of the neck

Neck dissection in skin cancer

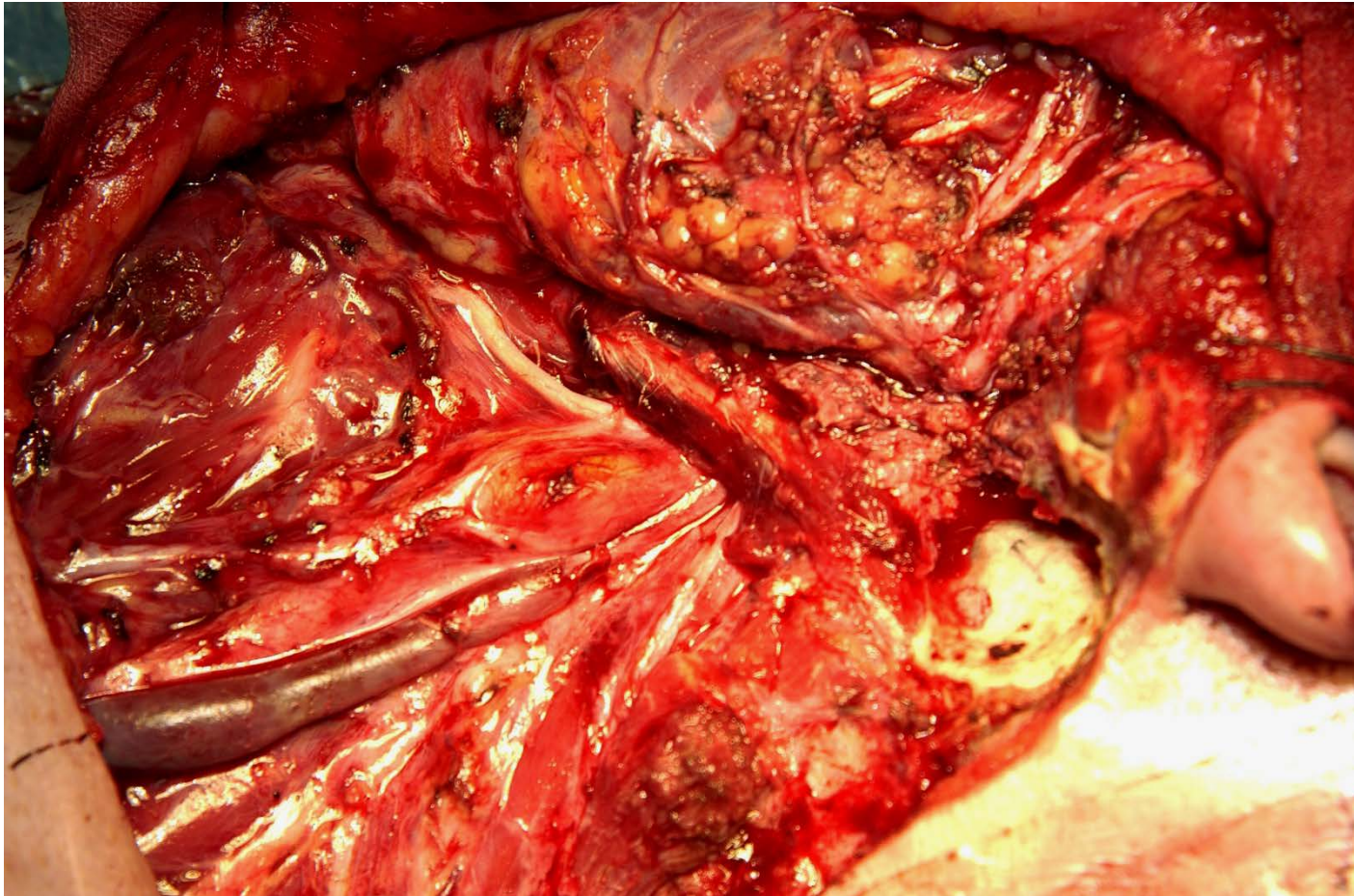
- Do always stage the neck ! US !
- Lymphatic drainage of the skin
 - Vertical line through the ear canal divides anterior from posterior lymphatic drainage
 - Parotid and facial lymph nodes are crucial

Lymphatic drainage of the skin



Treatment Options

- Neck dissection +/- Parotidectomy
 - According to Location of the Primary Tumor
 - Preservation of Spinal Accessory Nerve, Internal Jugular Vein and Sternocleidomastoid muscle (and Facial Nerve)
- Radiotherapy



Evidence in SCC of the skin

- No evidence for benefit of END vs. watchful waiting
- Some evidence for SNB or END in high risk tumors
- Strong evidence for adjuvant radiation after neck dissection pN > 1 and/or ECS

Evidence in Melanoma

- Good evidence against END
- Increasing evidence for SNB
- Some evidence for adjuvant radiation after neck dissection pN+ with multiple nodes

Algorithm for Melanoma

- No prophylactic END in clinically and radiologically cN0 neck
- SNB in clinically and radiologically cN0 neck if Breslow > 1mm
- SNB in clinically and radiologically cN0 neck if Breslow > 0.75mm and ulceration or high mitosis rate (pT1b)
- Therapeutic Neck Diss +/- parotidectomy in cN+ necks (no distant metastases in PET)
- Adjuvant radiation after neck diss with multiple lymph node metastases