La stadiazione patologica e le sue problematiche

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1. Problems and methods in pN detection

2. Problems and methods in pT and margin evaluations

Salivary gland and thyroid neoplasms not included

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Problems and methods in pN detection

Pre-operatory node status

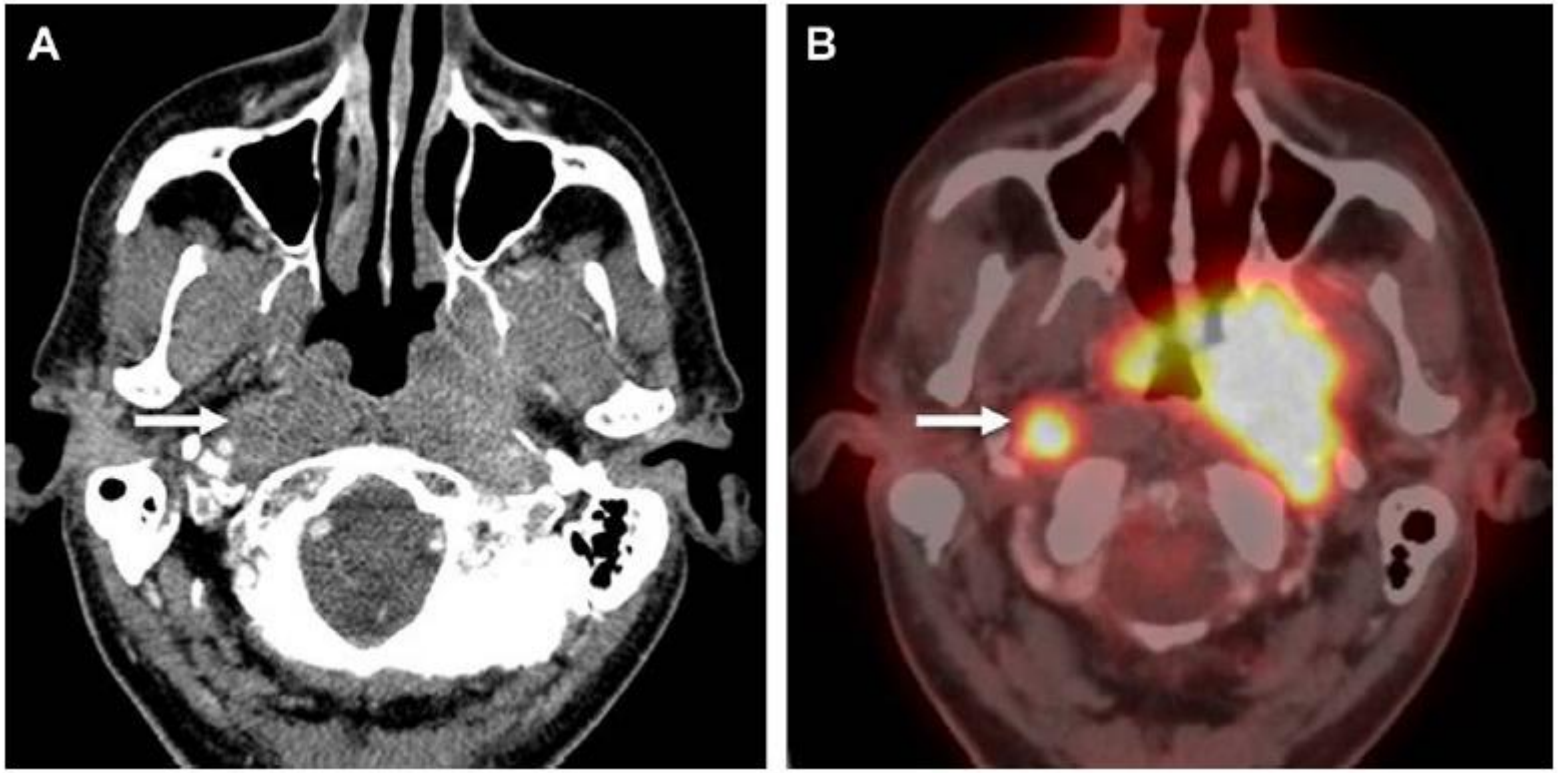
Clinical examination:

False-negative: 15% to 20%

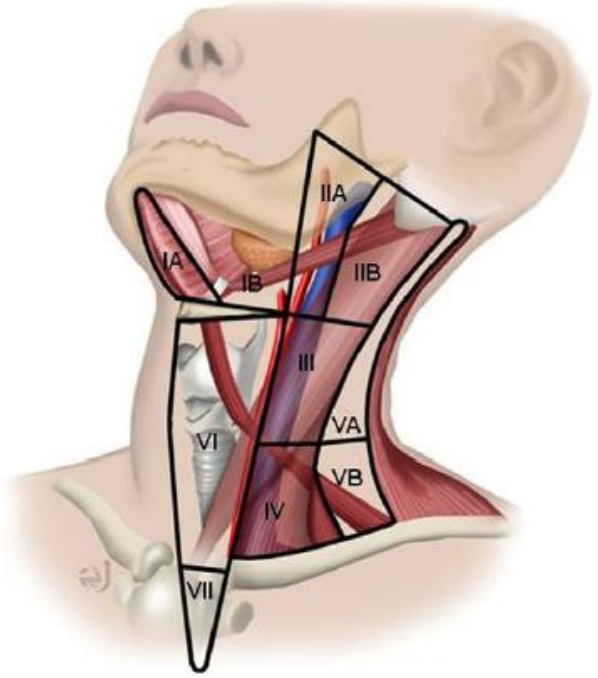
False-positive: 30% to 50%

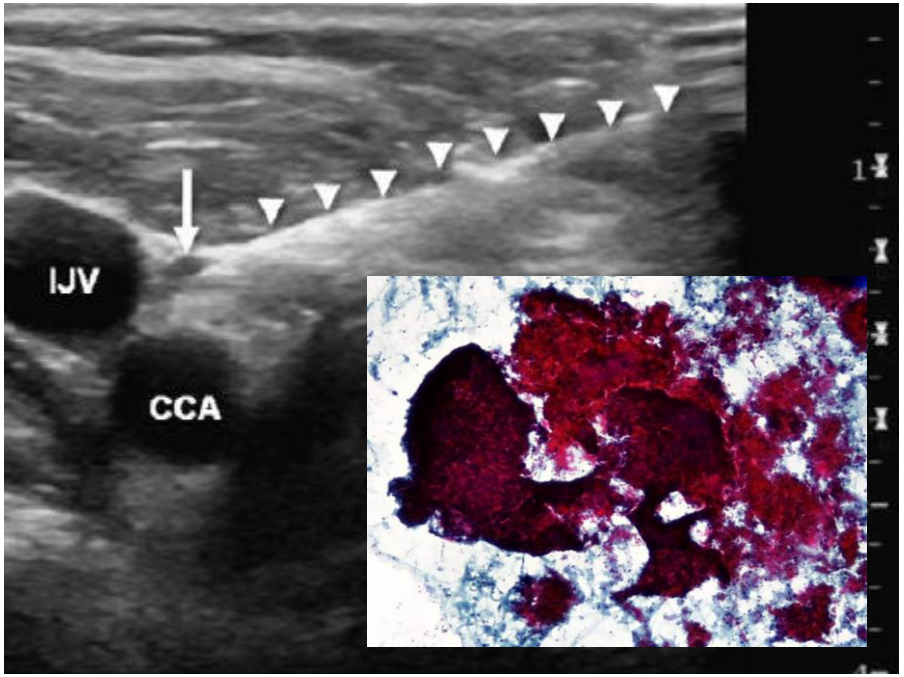
- **32% of patients with clinically negative lymph nodes who are not treated will develop LN metastases**
- **Given the high risk of clinically occult cervical LN metastases most head & neck surgeons perform neck dissection**
- **75% of neck dissections prove to be free of tumor at histologic examination so it follows that the majority of neck dissections have no therapeutic benefit and merely provide confirmatory negative staging data**

Crucial role of radiology


A
B

US-guided FNA





Dept.

pN assessment

Regional Lymph Nodes (N)* (See Part II Head and Neck Figures II.1–II.4)

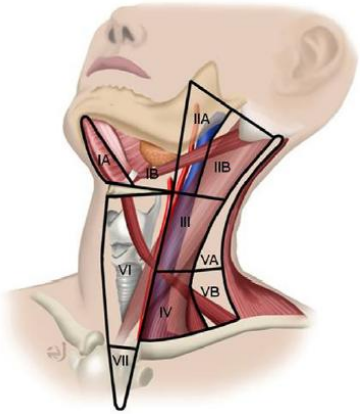
NX	Regional lymph nodes cannot be assessed
N0	No regional lymph node metastasis
N1	Metastasis in a single ipsilateral lymph node, 3 cm or less in greatest dimension
N2	Metastasis in a single ipsilateral lymph node, more than 3 cm but not more than 6 cm in greatest dimension, or in multiple ipsilateral lymph nodes, none more than 6 cm in greatest dimension, or in bilateral or contralateral lymph nodes, none more than 6 cm in greatest dimension
N2a	Metastasis in a single ipsilateral lymph node more than 3 cm but not more than 6 cm in greatest dimension
N2b	Metastasis in multiple ipsilateral lymph nodes, none more than 6 cm in greatest

Additional features to insert in the pathological report

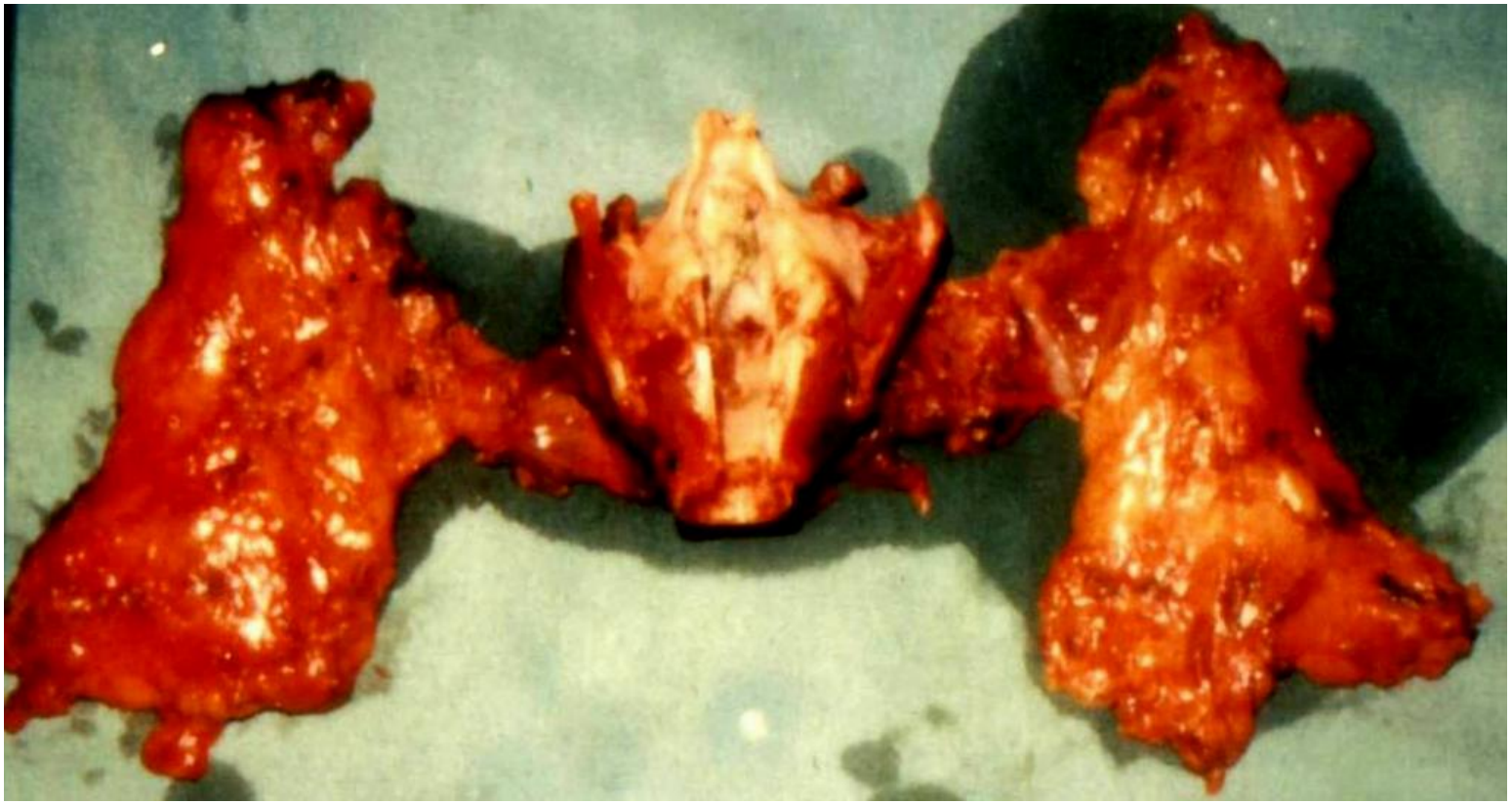
- **Lymph node location**
- **Extracapsular spread**

The distribution and the prognostic impact of regional lymph node spread from nasopharynx cancer, particularly of the undifferentiated type, are different from those of other head and neck mucosal cancers and justify the use of a different N classification scheme.

NX	Regional lymph nodes cannot be assessed
N0	No regional lymph node metastasis
N1	Unilateral metastasis in cervical lymph node(s), 6 cm or less in greatest dimension, above the supraclavicular fossa, and/or unilateral or bilateral, retropharyngeal lymph nodes, 6 cm or less, in greatest dimension* (Figure 4.19)
N2	Bilateral metastasis in cervical lymph node(s), 6 cm or less in greatest dimension, above the supraclavicular fossa* (Figure 4.20)
N3	Metastasis in a lymph node(s)* >6 cm and/or to supraclavicular fossa
N3a	Greater than 6 cm in dimension (Figure 4.21)
N3b	Extension to the supraclavicular fossa** (Figure 4.21)



Surgical specimens



Head and Neck Pathol (2009) 3:231–237
DOI 10.1007/s12105-009-0132-3

HEAD AND NECK PRE-MEETING OF THE 22ND EUROPEAN CONGRESS OF PATHOLOGY

Head and Neck Sentinel Lymph Node Biopsy: Current State of the Art

Philip Sloan

- **Review of the literature reveals scant published information regarding the utility of histopathologic techniques for sentinel node examination in the head and neck.**
- **The biological significance of either micrometastasis or individual tumor cells in head and neck cancer remains unanswered at present.**
- **Frequent benign lymph node inclusion: warning for PCR use**
- **Which is the best practice: frozen section or conventional procedure?**
- **Little has been published on the cost effectiveness of sentinel node biopsy in head and neck cancer.**

Problems and methods in pT and margin evaluations

- Different sites and subsites
- Division between anatomic sites and subsites sometime arbitrary
- Different types of surgery: open versus endoscopic
- Margins evaluation:
  - Intra-operatory frozen section
  - Fixed specimens

problems and difficulties in pT detection

Problems and methods in pT and margin evaluations

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- Margins evaluation:
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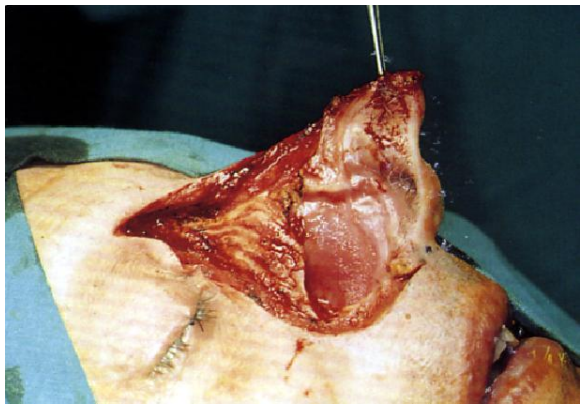
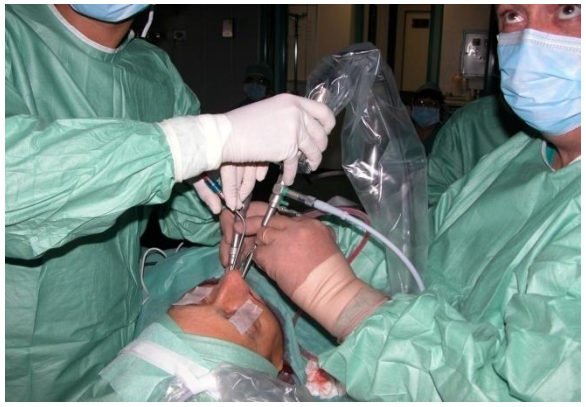
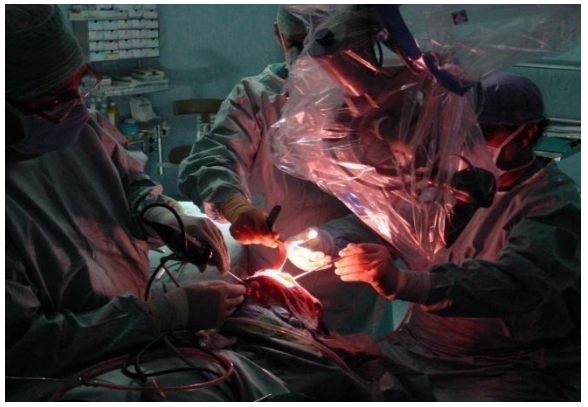
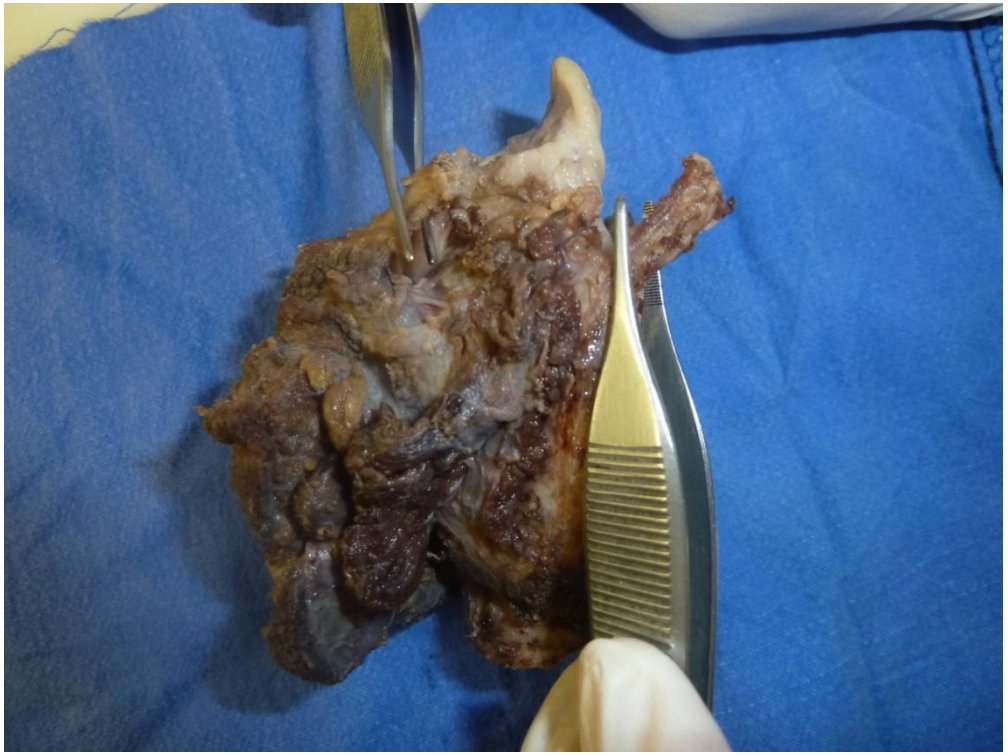
  - Fixed specimens

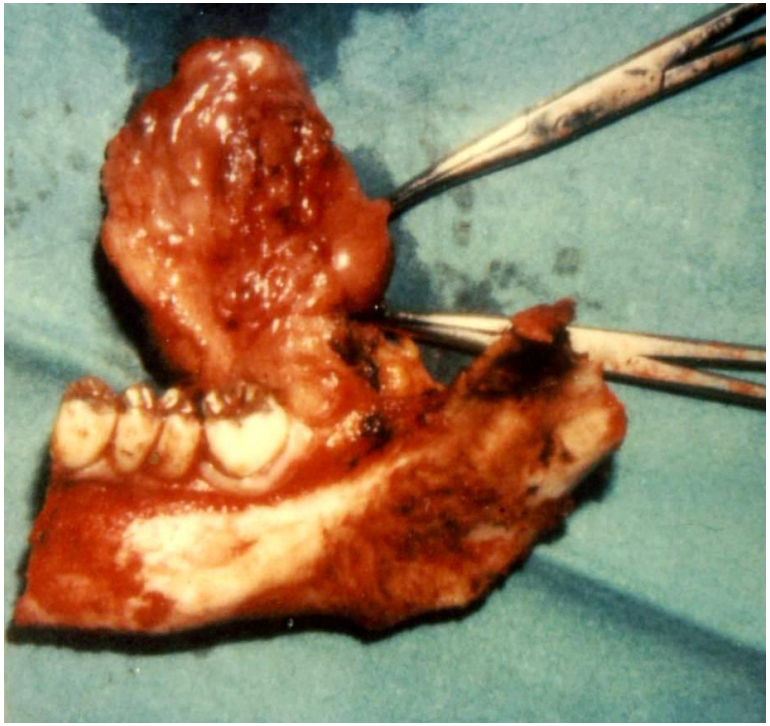




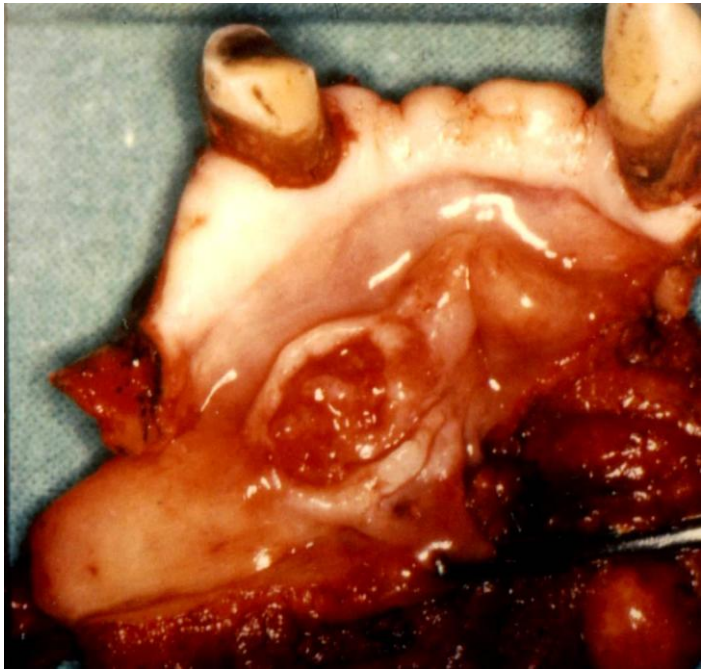
Open surgery

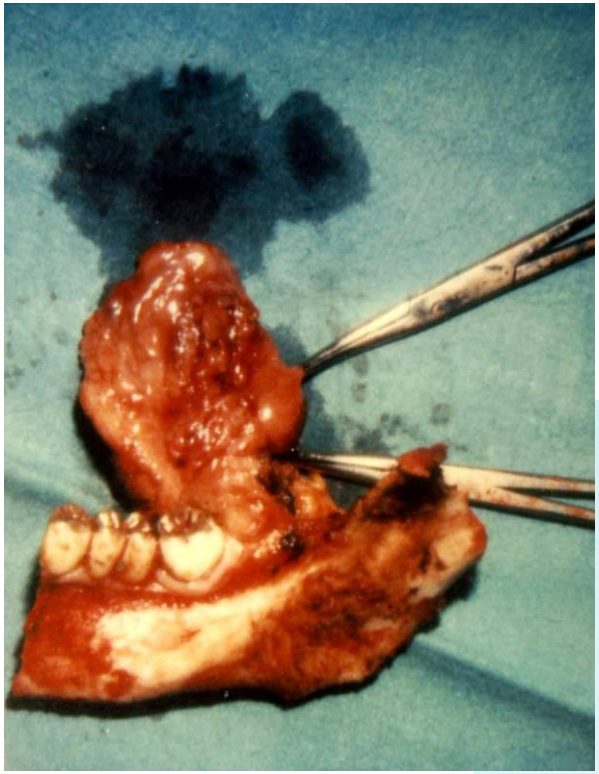
- **Distortion of resection specimens can lead to poor orientation and incomplete or inaccurate identification of surgical margins.**
- **The surgical staff should provide a simple line drawing or photograph showing the limits of the resection and marking, by ink or sutures, any areas of the margins, which are of concern or special interest.**

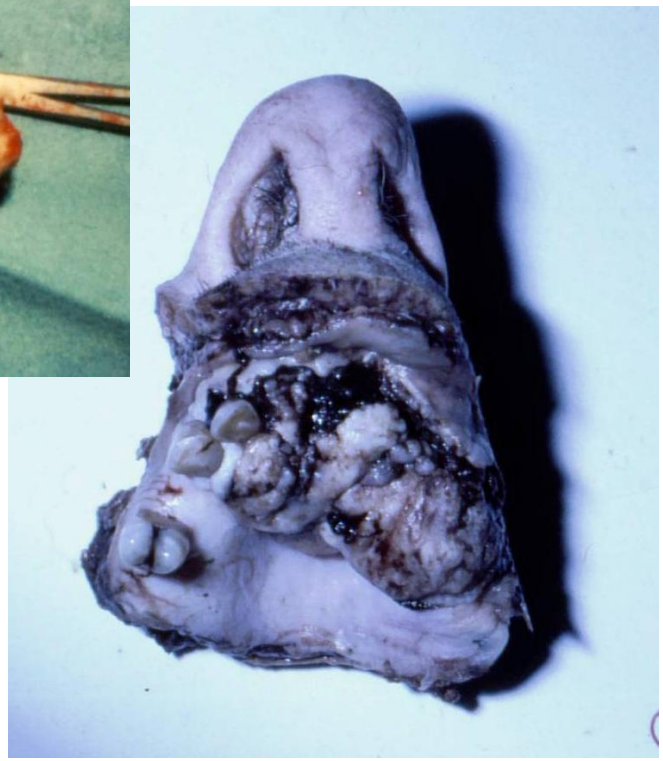


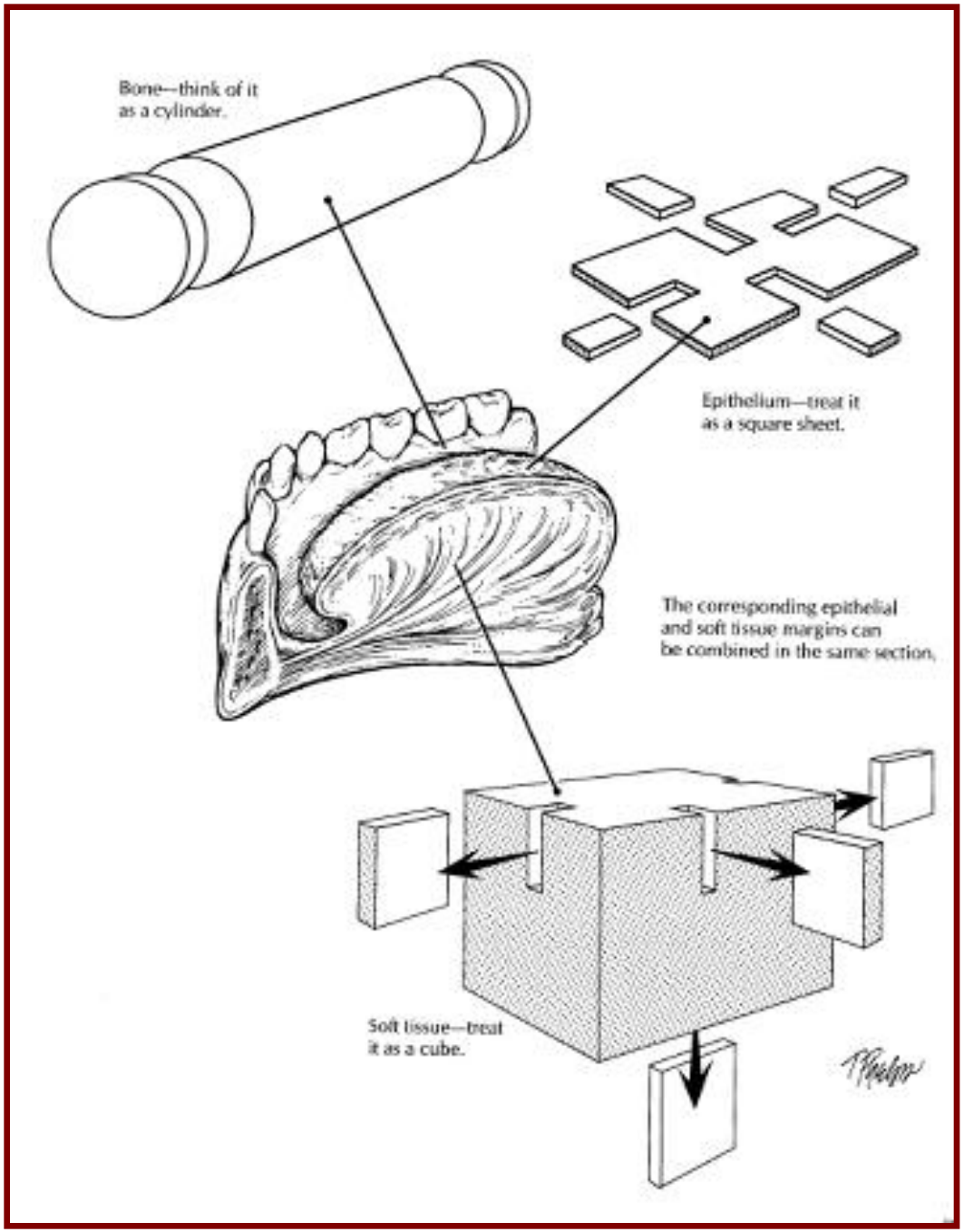
- **Care should be taken by the pathologist when inking the surgical margins – both peripheral and deep, bearing in mind that the deep aspect of large resections of the floor of mouth, may have been anatomically in contact with the tissues of nodal level I of the ND.**
- **Failure to recognize this anatomical relationship can lead to misinterpretation of the margin of clearance and confusion between the extent of direct spread of the primary tumor and extracapsular spread of metastatic tumor**

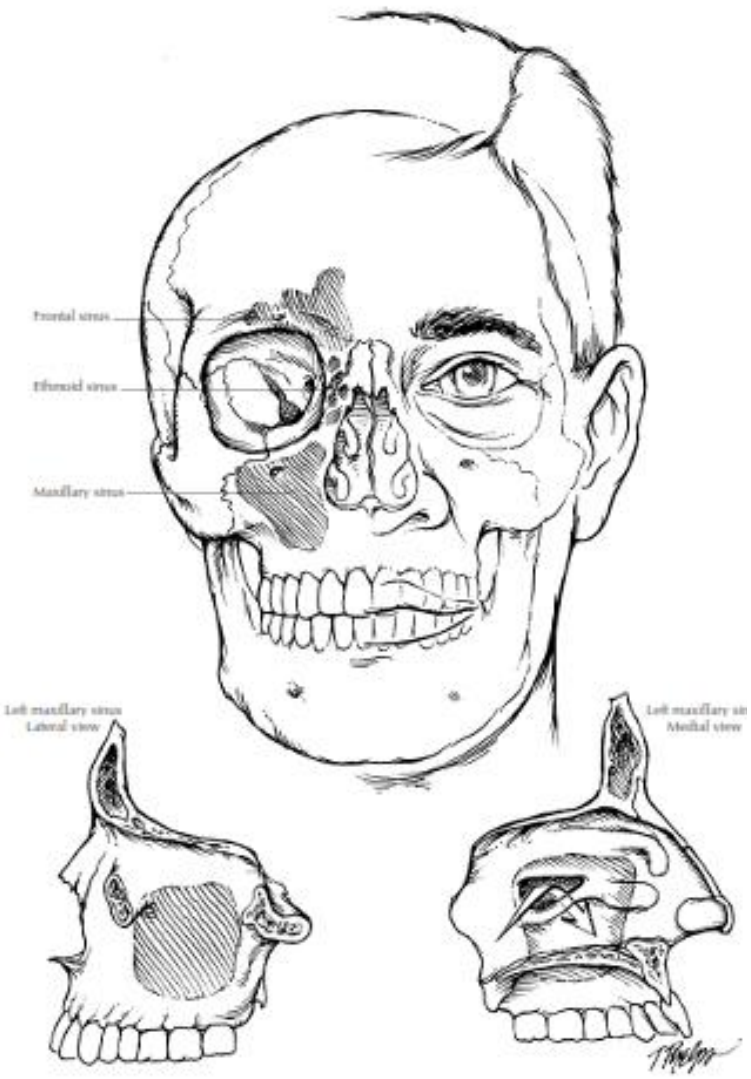


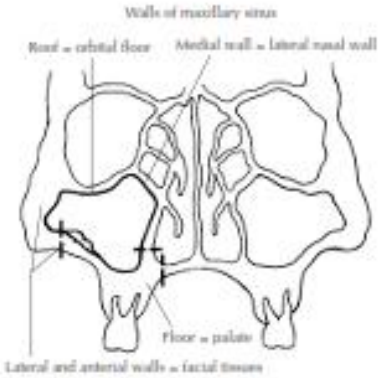


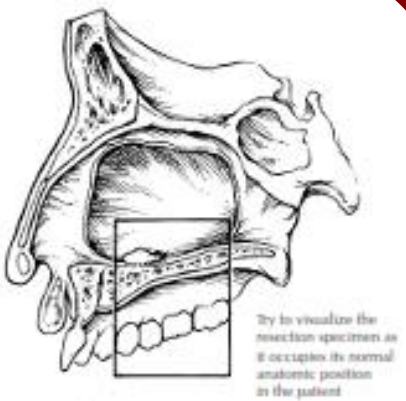


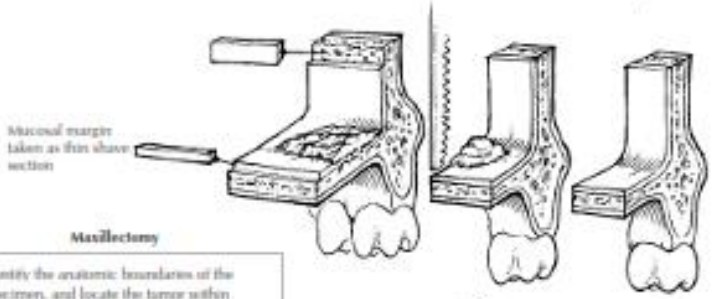



Bone—think of it as a cylinder.
Epithelium—treat it as a square sheet.
The corresponding epithelial and soft tissue margins can be combined in the same section.
Soft tissue—treat it as a cube.



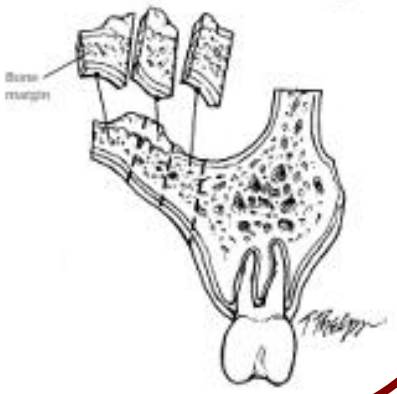






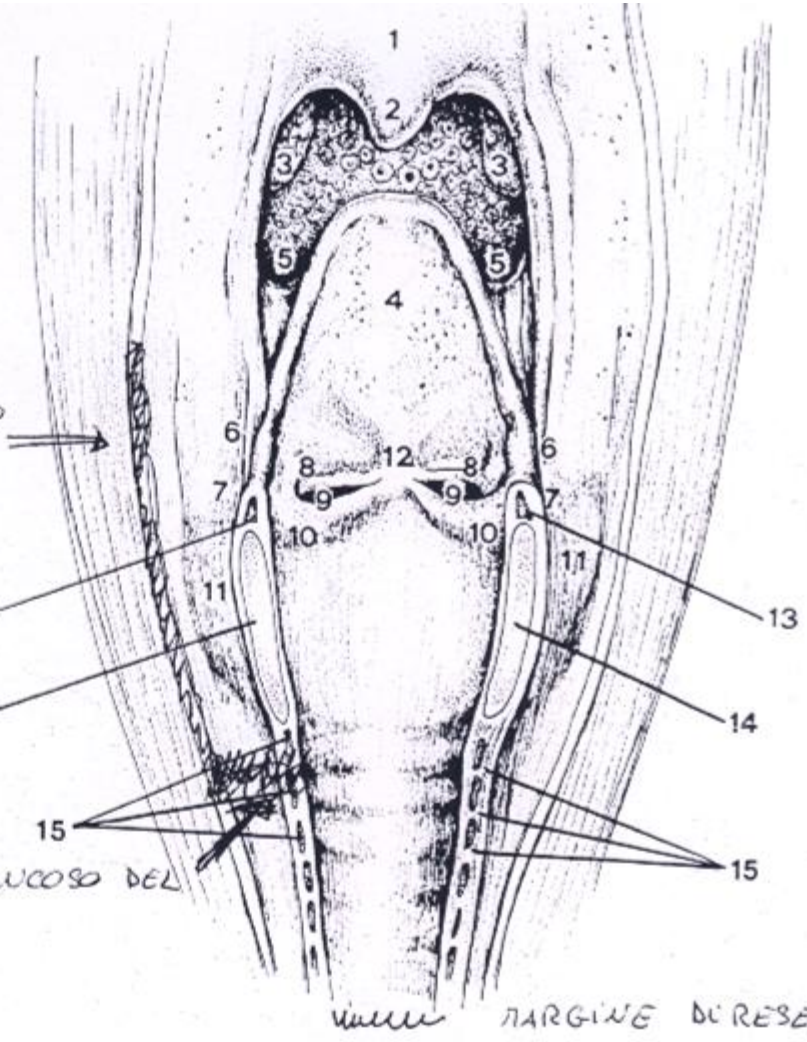
Maxillectomy

1. Identify the anatomic boundaries of the specimen, and locate the tumor within the maxillary sinus.
2. Ink the mucosal and soft tissue margins.
3. Sample all of the margins including the soft tissue, bone, mucosa, and skin. It may be most practical to submit the mucosal margins as thin shave (parallel) sections that are peeled off the underlying bone.
4. Section the specimen along a plane that best demonstrates the tumor's relationship to adjacent structures and compartments. These sections may require the use of a bone saw. Make additional sections to determine the tumor's size and extent of spread.
5. Submit sections of the tumor that demonstrate its relationship to adjacent anatomic structures and compartments.



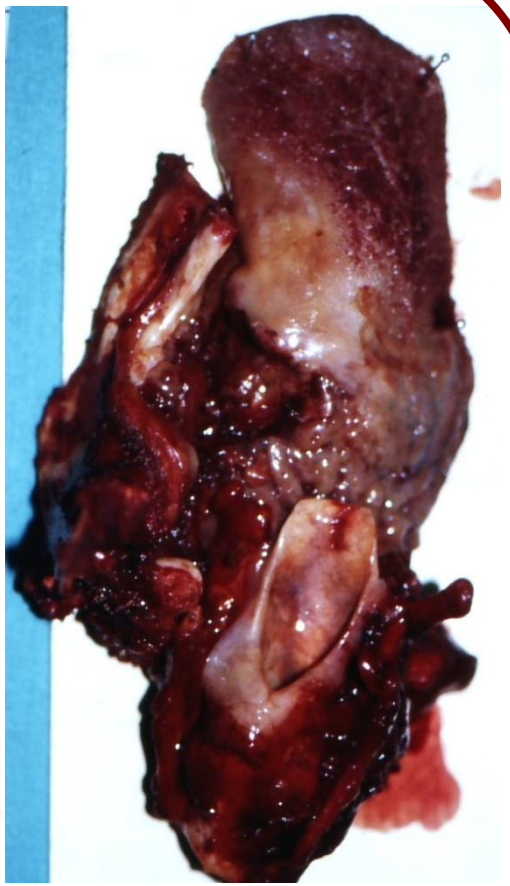
4. epiglottide
5. plica faringo-epiglottica
6. plica ariepiglottica
7. aritenoide
8. corda vocale falsa
9. ventricolo laringeo
10. corda vocale vera
11. seno piriforme
12. commissura anteriore
13. commissura posteriore
14. cartilagine cricoidea
15. anelli tracheali

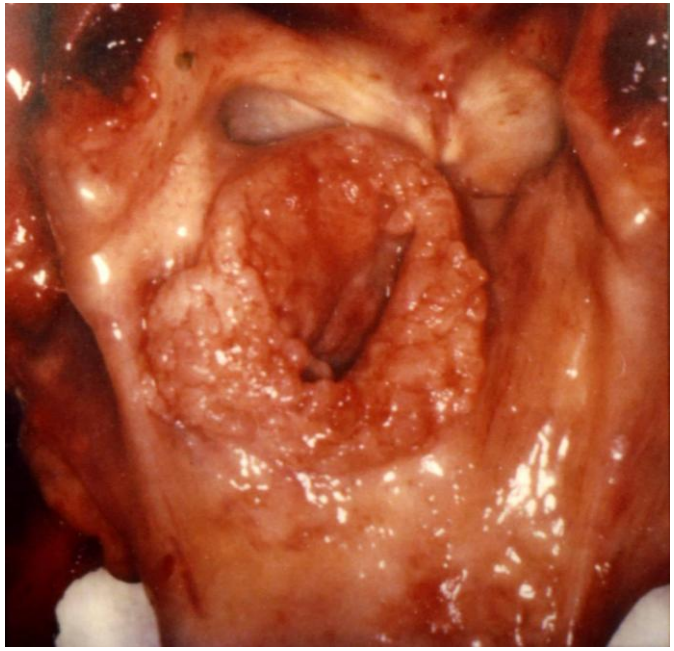
MARGINE LATERALE MUCOSO DEL SENO PIRIFORME
- terzo superiore
- terzo medio
- terzo inferiore

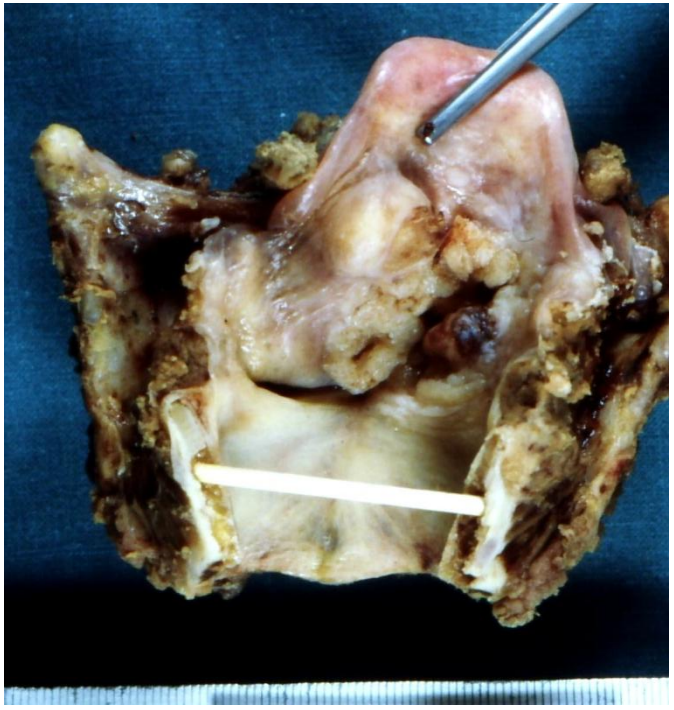


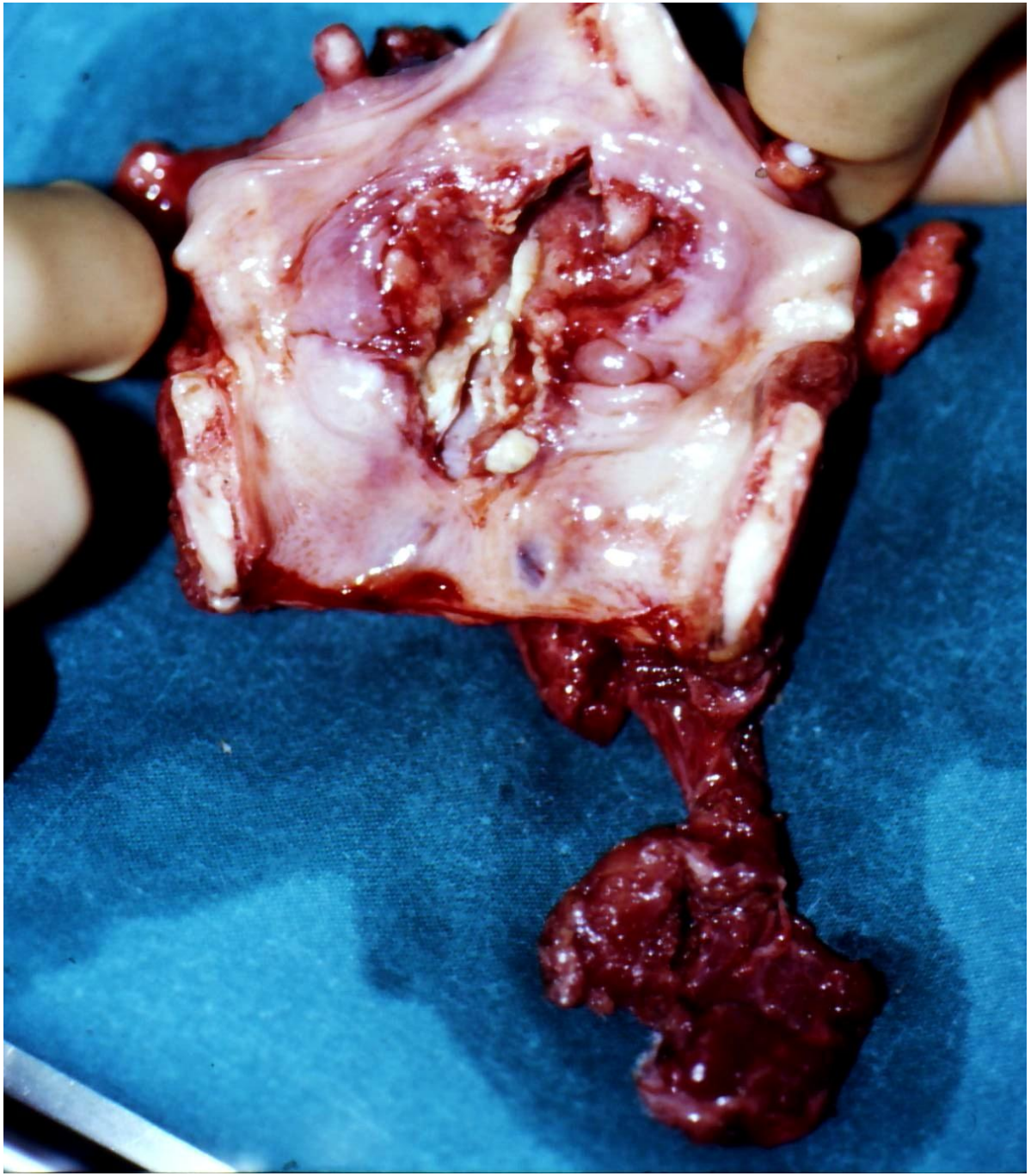
MARGINE INFERIORE MUCOSO DEL SENO PIRIFORME

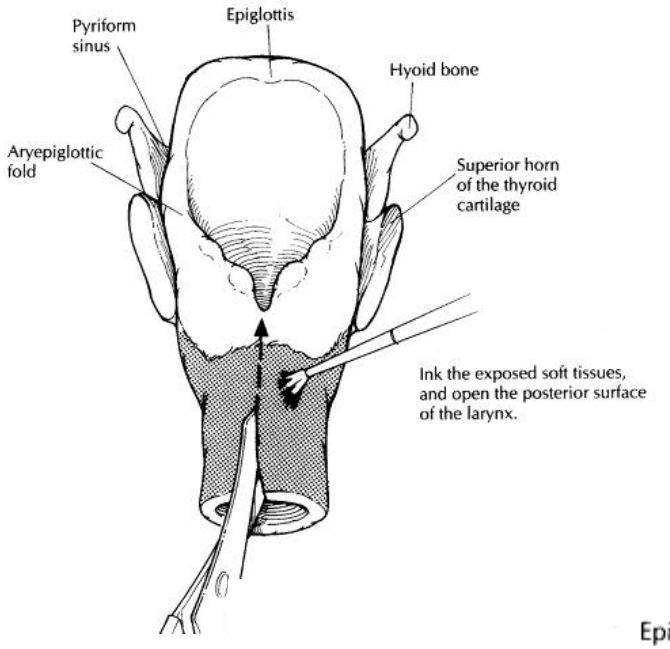
MARGINE DI RESEZIONE

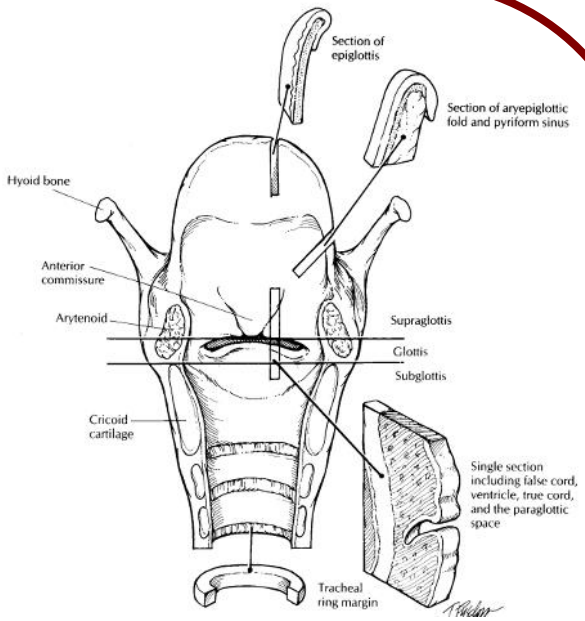









Pyriform sinus
Epiglottis
Hyoid bone
Aryepiglottic fold
Superior horn of the thyroid cartilage
Ink the exposed soft tissues, and open the posterior surface of the larynx.


Section of epiglottis
Section of aryepiglottic fold and pyriform sinus
Hyoid bone
Anterior commissure
Arytenoid
Supraglottis
Glottis
Subglottis
Cricoid cartilage
Single section including false cord, ventricle, true cord, and the paraglottic space
Tracheal ring margin

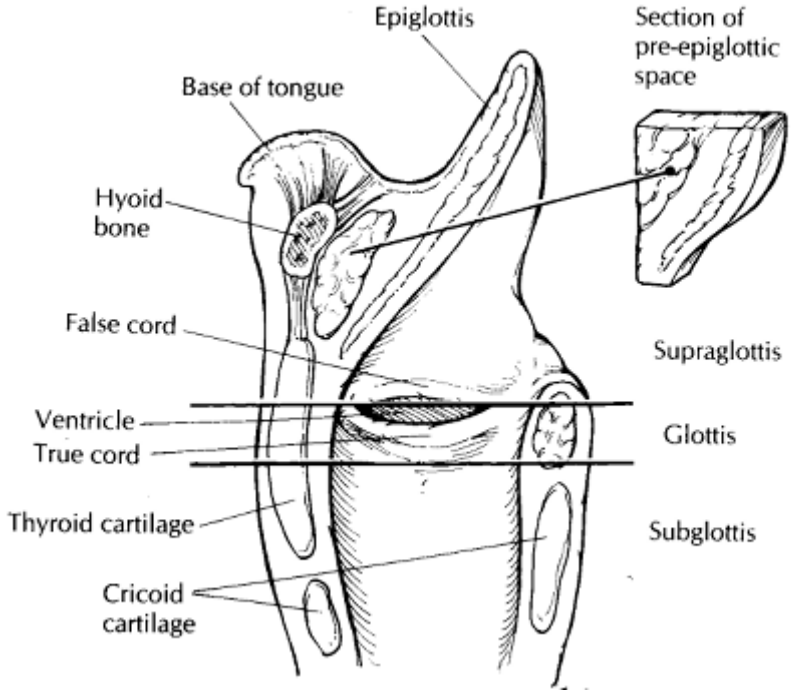

Epiglottis
Section of pre-epiglottic space
Base of tongue
Hyoid bone
False cord
Supraglottis
Ventricle
True cord
Glottis
Thyroid cartilage
Subglottis
Cricoid cartilage

TABLE III. Guidelines for Frequently Used Source Data for Capturing Elements for the TNM Head and Neck Classification

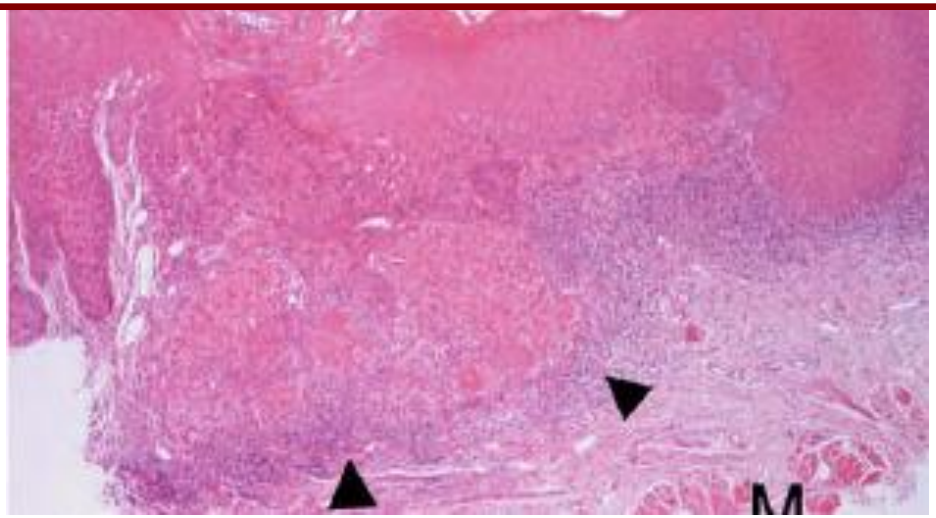
Anatomic site	Disease subset		Clinical description (including clinical diagrams)	MRI scan[a]	CT scan[a]	Endoscopy and examination under anesthesia
Oral cavity and oropharynx	Early[b]	Primary	+++	+	+	++
		Neck[c]	+++	+++	+++	+
	Advanced[b]	Primary	+++	+++	++	+++
		Neck	+++	+++	+++	+
Larynx and hypopharynx	Early[b]	Primary	+++	Not used routinely	+++	+++
		Neck	+++	+++	+++	+
	Advanced[b,d]	Primary	+++	++	+++	+++
		Neck	+++	+++	+++	+
Nasopharynx and paranasal sinus	All stages	Primary	++	+++	+	+
		Neck	+++	+++	++	+
Salivary gland and thyroid[e]	All stages	Primary	++	+++	+	+
		Neck	+++	+++	+++	+

Semin Surg Oncol 21:30-42,2003

Oral squamous cell carcinomas

Additional features to insert in the pathological report

- **Tumor thickness measurement**



Endoscopic surgery

EEC: multilayer technique with craniectomy

1) Tumor debulking

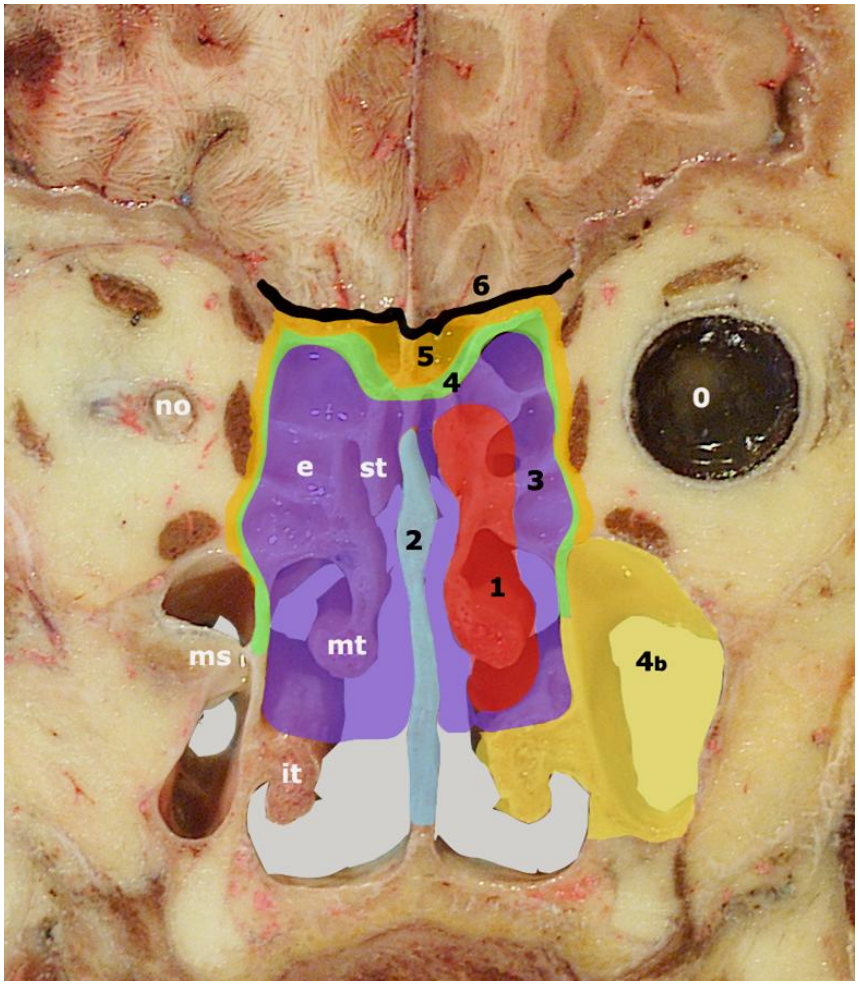
2) Removal of the septum

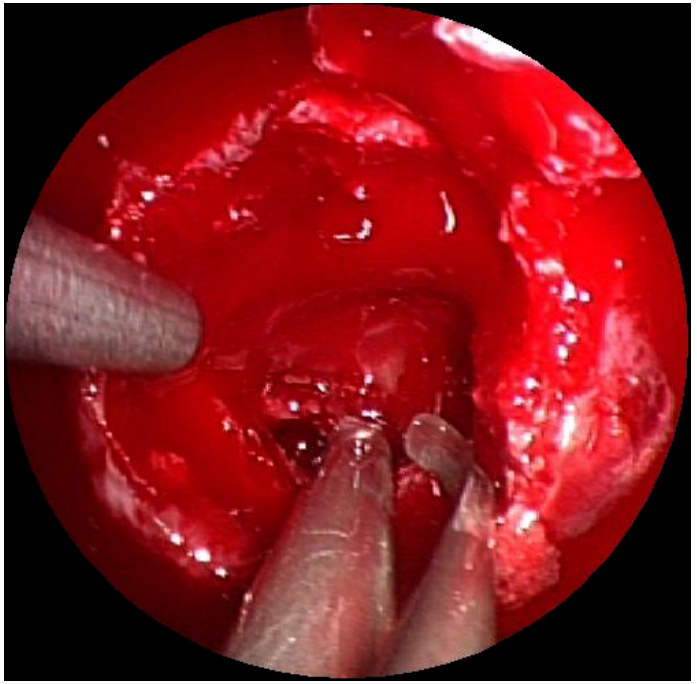
3) Draf III + Centripetal removal with subperiosteal dissection + Draf III

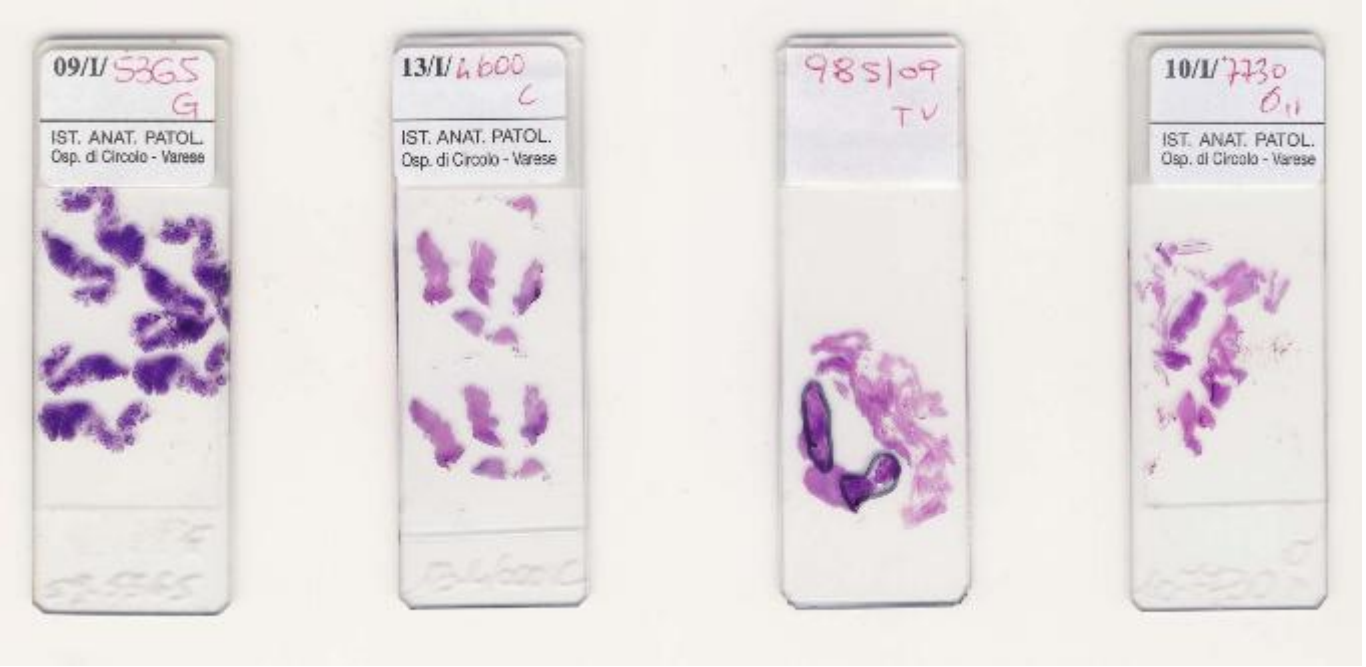
4) Removal of bone/cartilage in contact with tumor (skull base, lamina papyracea)

5) Removal of dura, olfactory bulb, periorbita, i.c. lesion

6) Skull base duraplasty



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Problems and methods in pT and margin evaluations

- Different sites and subsites
- Division between anatomic sites and subsites sometime arbitrary
- Different types of surgery: open versus endoscopic
- **Margins evaluation:**
  - **Intra-operatory frozen section**
  - **Fixed specimens**

Frozen section

A METHOD FOR THE RAPID PREPARATION OF FRESH TISSUES FOR THE MICROSCOPE.

LOUIS B. WILSON, M.D.
Pathologist St. Mary's Hospital.
ROCHESTER, MINN.

While engaged in general pathologic work I shared the common distrust of frozen sections of fresh tissues for microscopic diagnosis. On taking charge recently of the laboratories of the Drs. Mayo, surgeons, I carefully tested the various methods hitherto published and found them either too slow for results while the patient waits under the anesthetic or else giving poorly differentiated cell detail. After considerable experimentation the following technic was discovered, and for the last six months it has given uniformly excellent preparations:

1. Bits of fresh tissue not more than 2x10x10 mm. are frozen in dextrin solution and cut in sections of from 10 to 15 microns thick.
2. The sections are removed from the knife with the tip of the finger and allowed to thaw thereon.
3. The sections are unrolled with camel's-hair brushes in 1 per cent. NaCl solution.
4. The sections are stained from 10 to 20 seconds in neutral Unna's polychrome methylene blue.
5. They are washed out in 1 per cent. NaCl solution.
6. They are mounted in Brun's glucose medium.

The microtome which I use is the Spencer automatic with a CO_2 attachment in which vulcanite is substituted for brass in the wall of the freezing chamber, thus insulating the freezing plate. Thawing the section on the finger prevents to a great extent the formation of bubbles. The well-made camel's-hair brushes used by artists are much more useful for handling tissues than those usually furnished by laboratory supply houses. A heavy, shallow watch glass over a black surface is the best receptacle in which to unroll sections. Sections are best handled in the stain folded over a lifter made of a small glass rod drawn out and bent at convenient angle. The section is kept constantly moving while it is in the stain. The stain is contained in a minute cup to facilitate the rapid recovery of the section should it slip from the lifter. Washing out is done in several ounces of salt solution in a white porcelain dish and is continued only while the stain comes away freely. Brun's glucose medium (which is made by mixing distilled water 140 c.c., glucose 40 c.c., and glycerin 10 c.c., then adding camphorated spirit 10 c.c. and filtering), is held in an oval dish of porcelain (an "undecorated match safe") of such a size that a three-inch slide will rest in a slanting position, with one end in the bottom of the dish and the other on its edge. The section is spread out on the slide while it is in this position. The slide is then carefully withdrawn from the dish, the excess fluid removed, a cover-slip dropped over the section and the specimen is ready for the microscope.

The whole process can be gone through in one and a half minutes from the time the tissue is placed on the freezing plate of the microtome until the stained specimen is on the stage of the microscope. The resulting coloring is uniformly good with the tissue elements sharply contrasted in red, purple and dark blue.

A diagnosis may be made from such preparations in a large percentage of surgical cases in which a diagnosis is possible by a study of sections of the same thickness cut from fixed tissues and stained with hematoxylin and eosin.

Journal of the American Medical Association *(1905;45:1737)*.

The four legitimate purposes for frozen section

1. To establish the presence and nature of a lesion
2. To determine the adequacy of surgical margins
3. To establish whether a tissue obtained contains diagnostic material, even though further surgery is not contemplate at the time
4. To identify or diagnose any abnormality of tissue observed during surgery that gives rise to a question in the surgeon's mind

Technical aspects

1. **Frozen-section lab adjacent or not to operatory rooms**

2. **Frozen-section procedure**

Frozen-section lab site

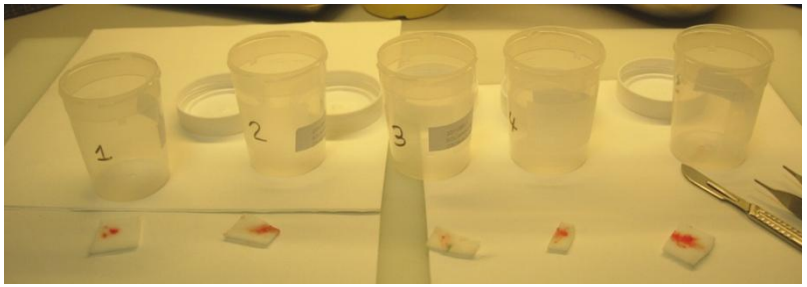
Frozen-section procedure

(10-15 minutes)

Handling of the tissue sample

Tissue specimens should be sent to the pathologist in the unfixed state. Immersion in formalin, even for a brief time, interferes with adherence of the section to the glass slide
To avoid dessication the specimen should be sent wrapped in a piece of gauze moistened with saline solution

Gross specimen examination and tissue selection for cryostat sectioning



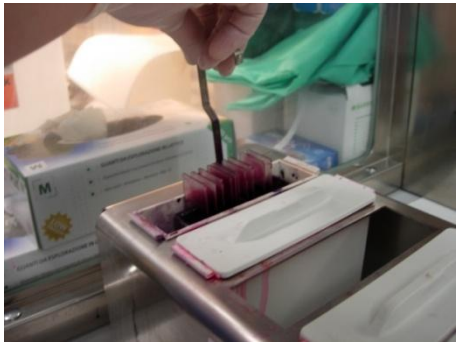
1-Freezing



2-Cutting



3-Staining



4-Diagnosis


Accuracy of frozen-section procedure

In reviewing publications evaluating the accuracy of frozen-section diagnosis in head and neck surgery it clearly appears the high accuracy of the procedure (>90%)

(Remsen et al. *Laryngoscope*, 94: 519,1984; Zarbo et al. *Arch Pathol Lab Med* 115:1187,1991)

Factor involved in improving the reliability of frozen section are:

- **Preparations of high quality**
- **Experience of the pathologist**
- **Familiarity of the pathologist with the clinical history**
- **Direct communication between pathologist and surgeon**
- **Continual retrospective critical analysis of performance**
- **Examination of selected cases and periodic discussion of frozen-section with the surgical team**

Frozen-section indications for sinonasal tumors

1. **To establish the presence and nature of a lesion**

2. **To determine the adequacy of surgical margins**

3. **To establish whether a tissue obtained contains diagnostic material, even though further surgery is not contemplate at the time**

Gandour-Edwards RE et al. *Head Neck Surg* 15:33,1993

2210 frozen sections from 258 patients:

88.1% (1947) surgical margins
11.7% (25) diagnosis
0.2% (5) tissue identification

Contraindications

- The frozen-section diagnosis carries no immediate decision
- Calcified tissue
- Tissue specimen is unique and very small
- Lesions requiring extensive study including ancillary techniques (immunohistochemistry) because their complexity

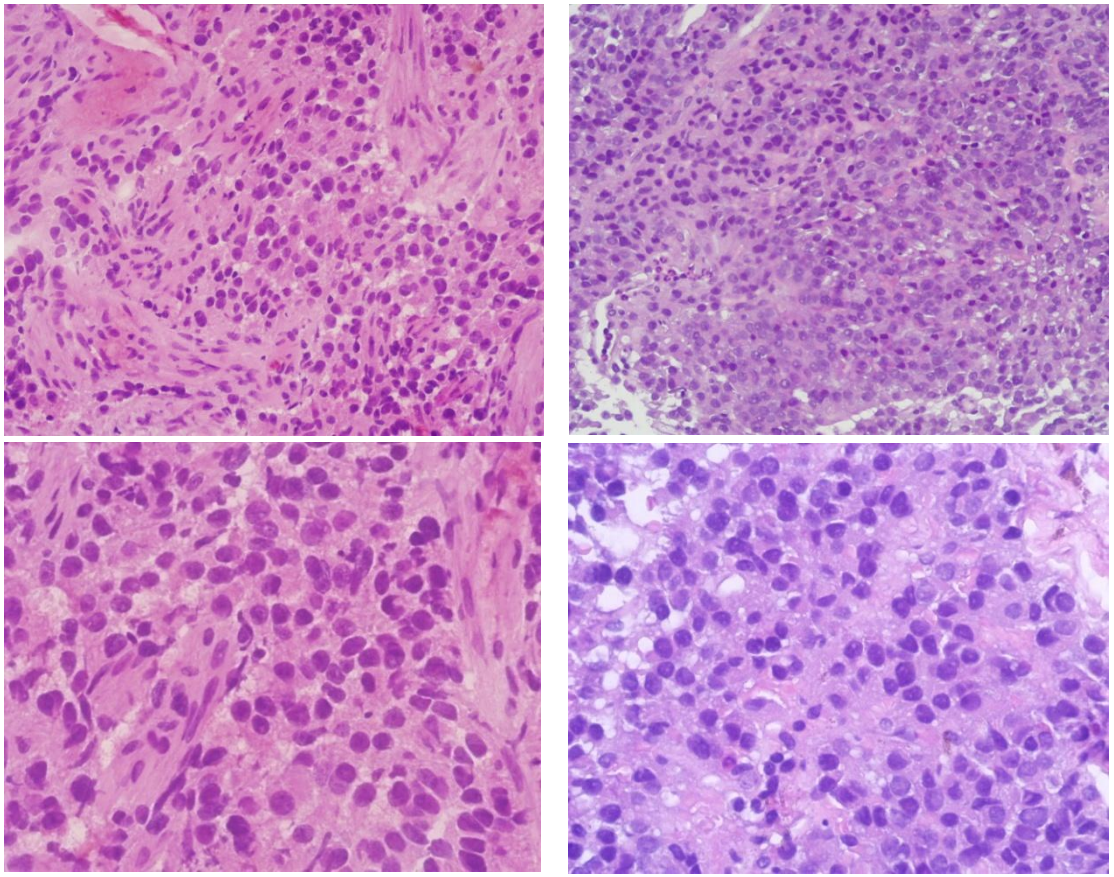
Errors

- Sampling
- Interpretative
- Communicative
- Technical

Surgical pathology technical considerations

- **Quality of section directly correlated with the freezing procedure**
- **Only H&E staining**

Frozen-section *Paraffin-embedded*



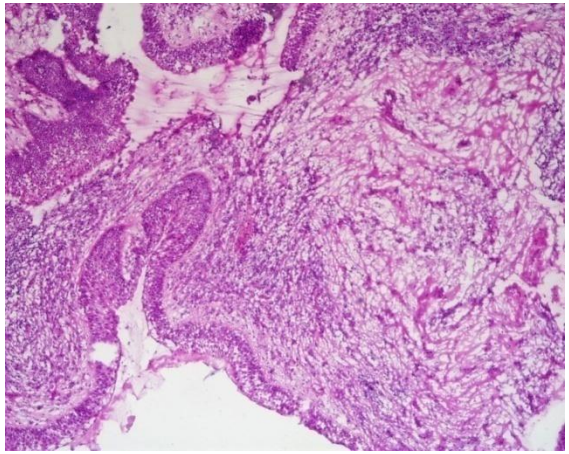
Possible answers:

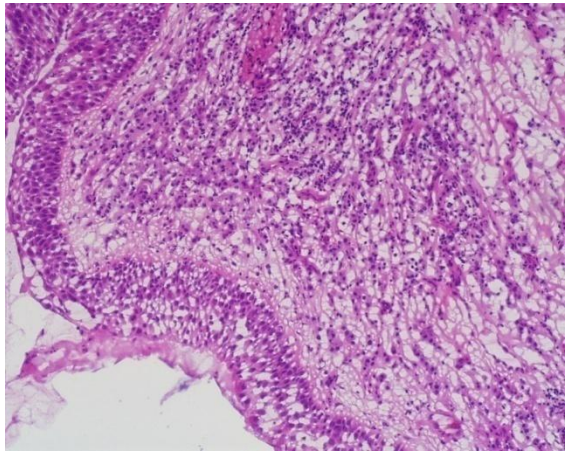
1. **No tumor infiltration**
2. **Tumor infiltration**
3. **Uncertain histological picture**

Simple diagnoses

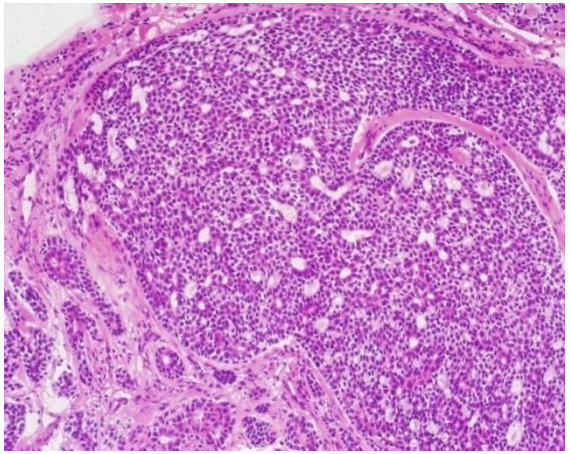
Example

1. No tumor infiltration

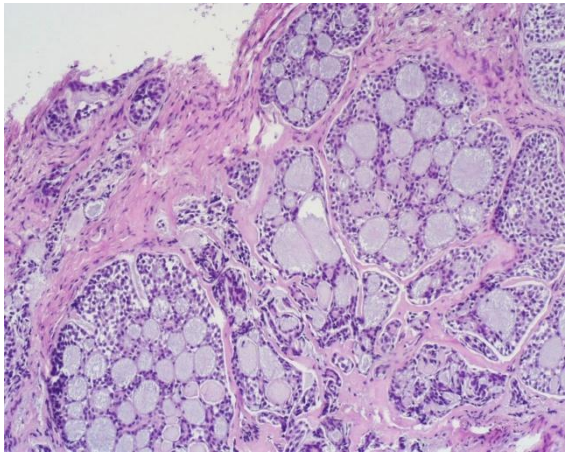




2. Tumor infiltration



Frozen



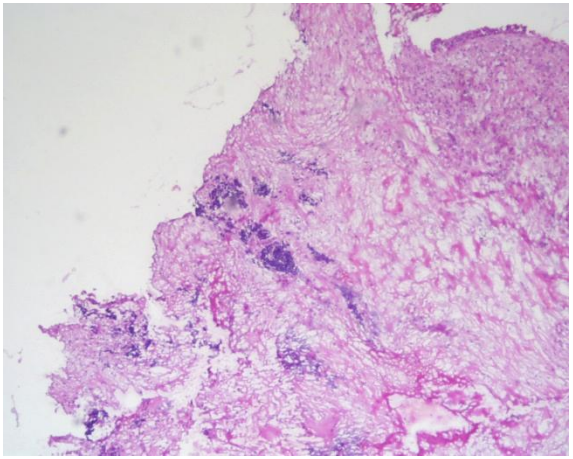
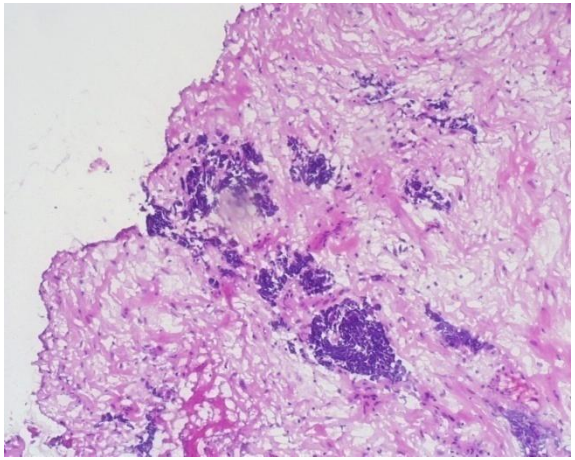
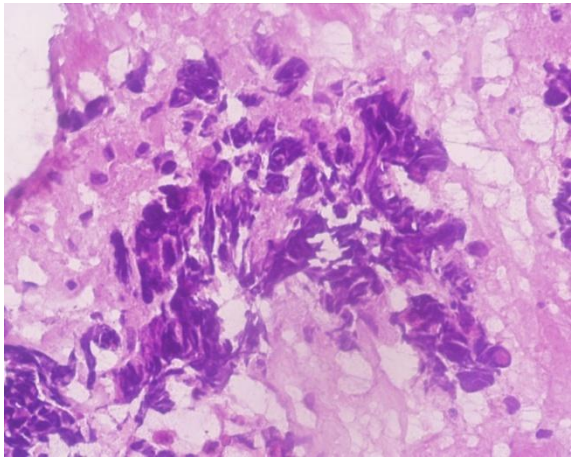
Paraffin

Difficult diagnoses

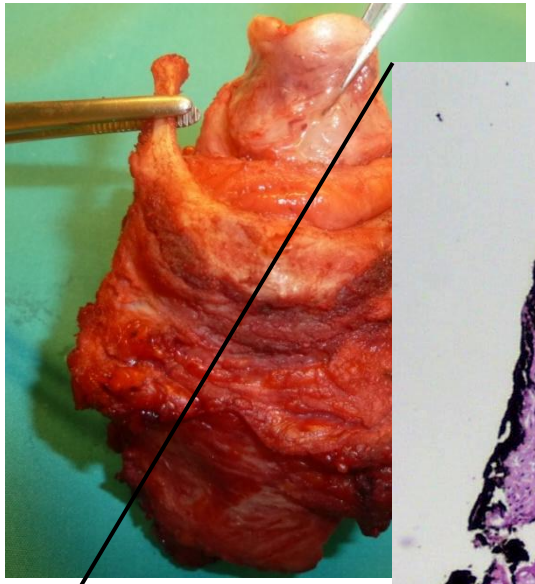
Example

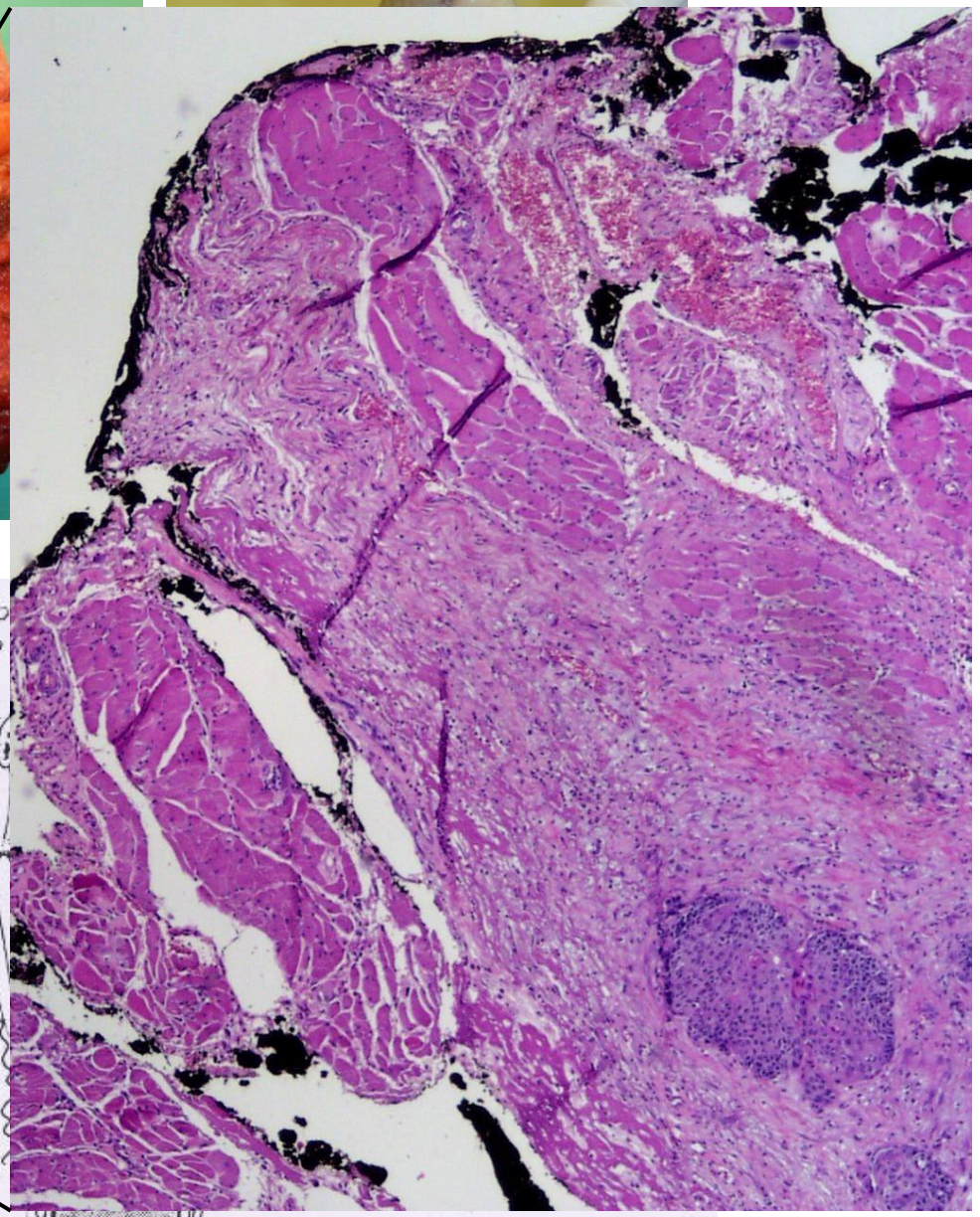
3. Uncertain histological picture

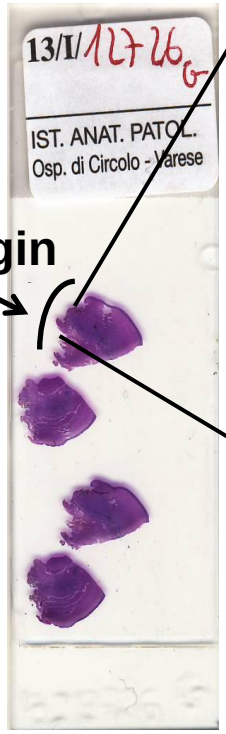
- **Thermic injury of the tissue**
- **Tissue stricture** (lymphoma, NEC, esthesioneuroblastoma)

Fixed specimens



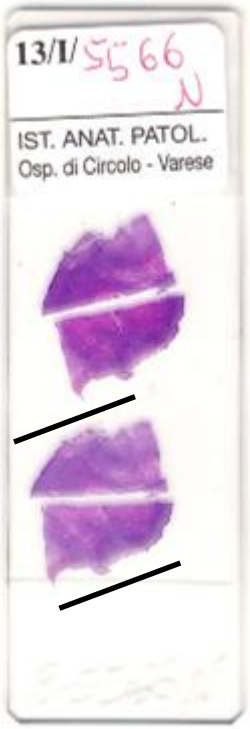


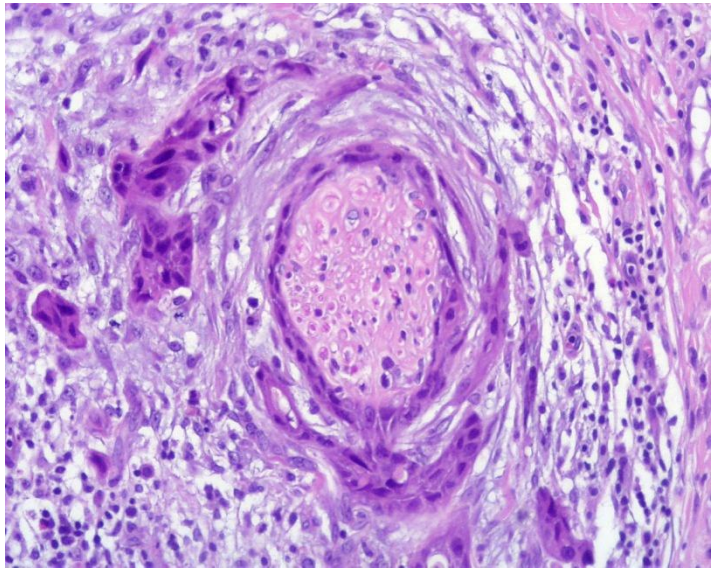

13/I/1726 G
IST. ANAT. PATOL.
Osp. di Circolo - Varese

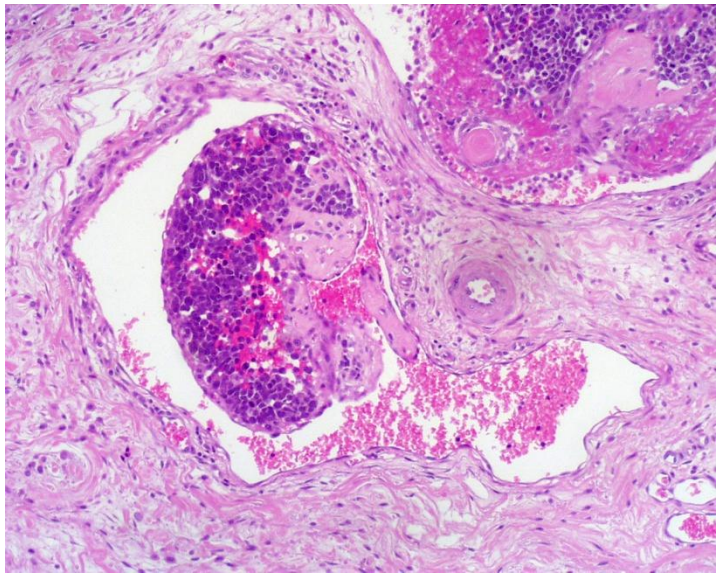
margin

MARGINE PRO
SOPRAIOIDEO
TESSUTI
PRELARINGEI

Perineural and vascular invasion







Conclusions and take-home message

- **Head and neck anatomy is difficult**
- **Different types of surgical approaches**
- **Different types of therapies**
- **The choice of therapy may be influenced by additional parameters not included in TNM**
- **Value of details**

Multidisciplinary approach

Head & neck surgery
Radiology
Pathology
Oncology
Radiotherapy

Ospedale di Circolo Fondazione Macchi

The Insubria University Hospital of Varese

Head & Neck Oncology Team

UNIVERSITAS STUDIORUM INSUBRIAE