The International Federation of Head and Neck Oncologic Societies

Current Concepts in Head and Neck Surgery and Oncology 2017

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of Head and Neck Oncologic Societies
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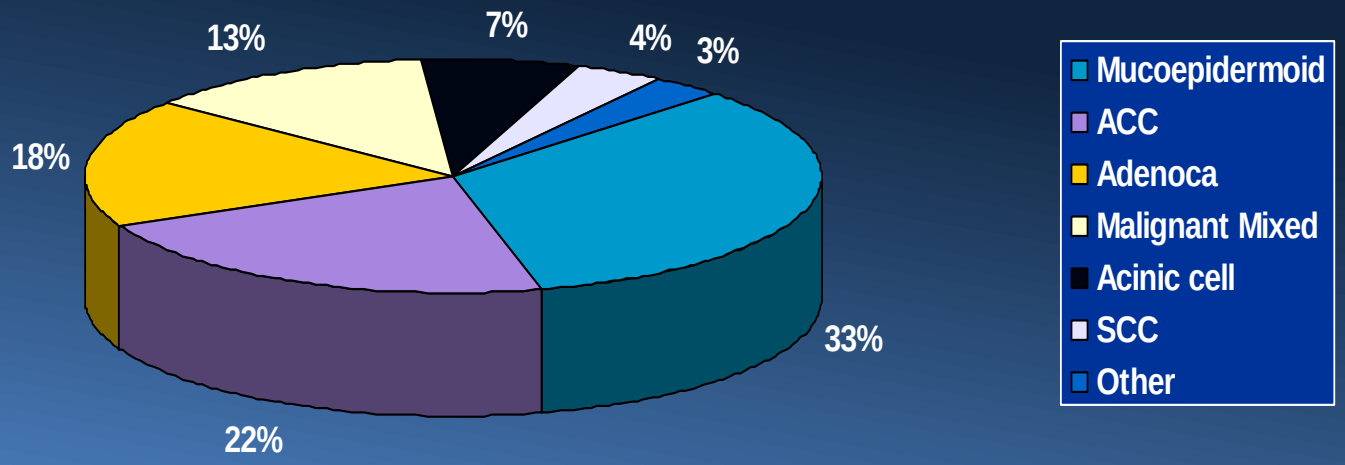
Surgery for Salivary Glands Cancer

Ehab Hanna

Major Salivary Gland Cancer

Histology



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Outline

- Questions
  - Preoperative clinical evaluation
  - Extent of surgery for the primary tumor
  - Management of the facial and other cranial nerves
  - Role of neck dissection
  - Loco-regional palliative surgery in the presence of distant disease
  - Indications of postoperative adjuvant therapy
  - Management of unresectable disease

Patient Evaluation

- Clinical features
- Imaging
- Fine Needle Aspiration

Case Presentation

- 51 yo female with a six month history of a painless parotid mass
- She reports significant growth over the last 6 months.
- She denies pain, facial weakness, otalgia, dysphagia, odynophagia, symptoms of airway obstruction, trismus.




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Clinical Features

- What is the most common presentation of parotid neoplasms?

1. Painless mass
2. Well defined
3. Non-tender
4. Mobile
5. Tail of the parotid

Deep Lobe Tumors

Signs and Symptoms of Malignancy?

- Pain
- Rapid increase in size
- Facial Paralysis
- Skin involvement
- Nodal metastasis
- History of cutaneous cancer
  - scalp, face, ear, lids

Differential Diagnosis

Inflammatory Disease

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Inflammatory Pseudo Tumor

Imaging
Indications, Type of study?

- Indications
  - Suspected or confirmed malignancy
  - Deep lobe tumors
  - Larger tumors
  - Minor salivary gland tumors
- Studies
  - MRI (soft tissue detail, PNS)
  - CT (bone invasion)
  - US (diagnosis of lesion and associated LN)
  - PET-CT?
- Findings
  - Intra or extra glandular
  - Extent of tumor
  - Relationship to critical structures
  - Associated LN
  - Diagnosis?


88
DOB: 1


Axial T1 +C
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SL:31.0434
A
MD Anderson
MORALES, ORALIA
MR# 1021326
DOB: 11/14/1962
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FOV: FA:160.0
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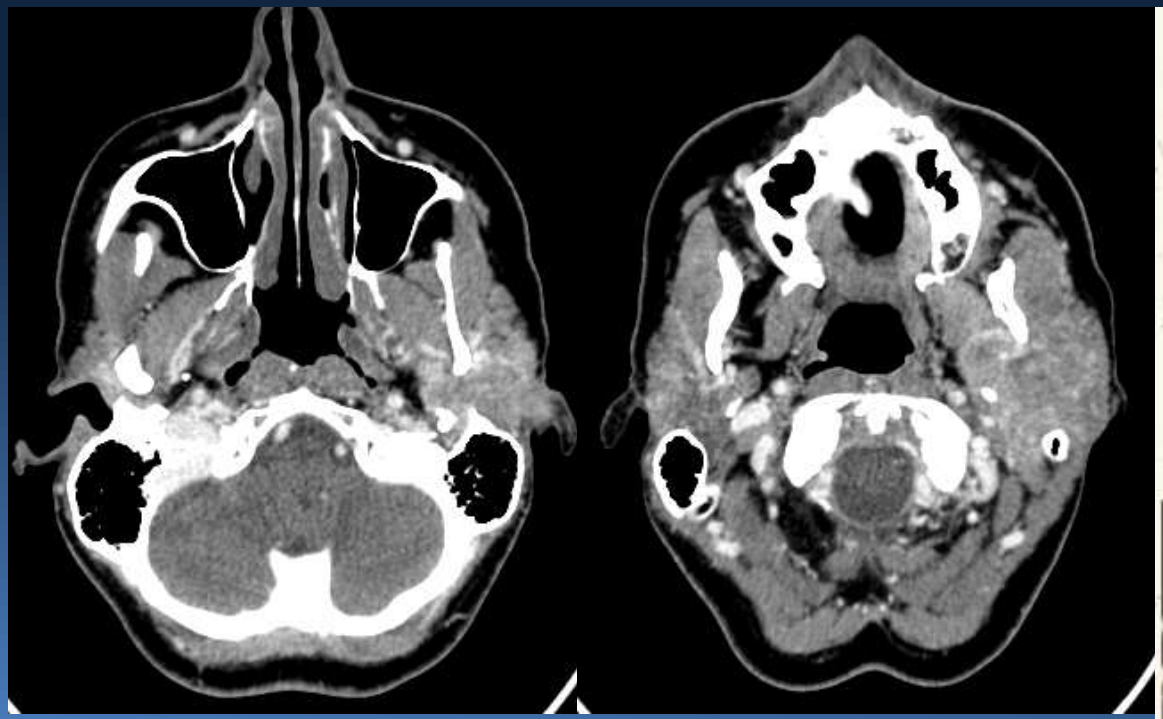
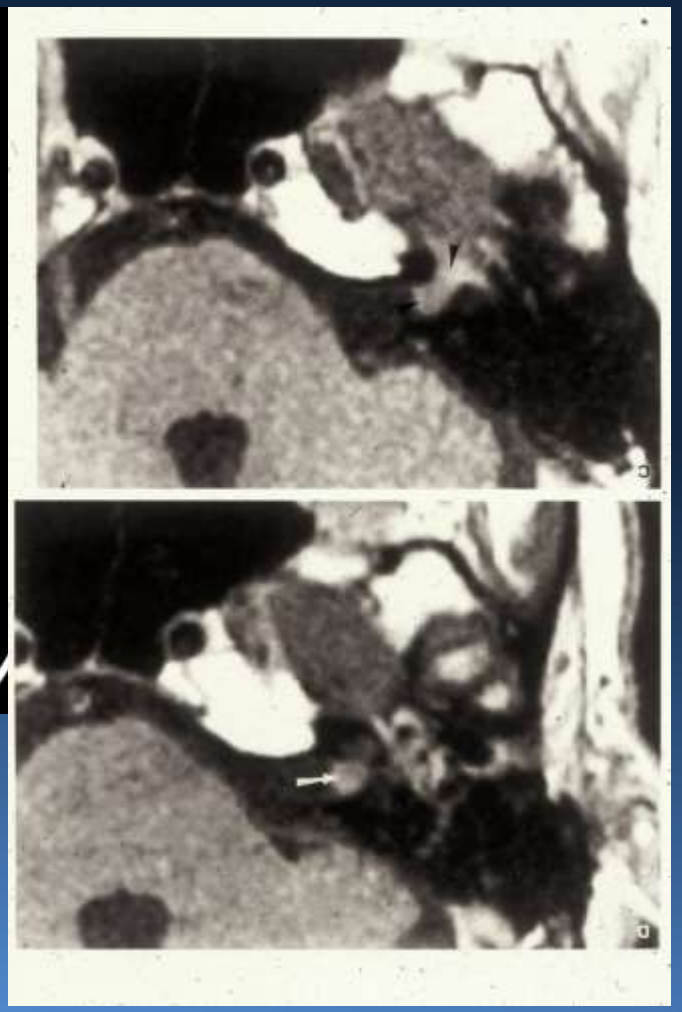
Evaluating Extent of Disease





CT & MRI Complimentary

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KJ (254255): parapharyngeal mass

- overall 3D reference from CT + mass from hybrid CT/MR segmentation
- parotid in blue and submandibular in green, lesion in magenta and mandible in ocre

Accuracy of FNAB

Sensitivity to diagnose malignancy	**83%**
Specificity to diagnose malignancy	**99%**
Positive predictive value	**98%**
Negative predictive value	**97%**

Head and Neck 32:104-108, 2010

FNAB

- Is FNAB really necessary? Would it change the course of management ?
- Overall, FNAB resulted in a change in the clinical approach to 35% of a study of 100 patients
- Examples:
  - avoiding surgical resection for lymphomas and inflammatory masses.
  - adopting a more conservative approach with benign tumors in elderly and high surgical risk patients.
  - better preoperative counseling of patients regarding the nature of the tumor, the likely extent of resection, management of the facial nerve, and the likelihood of a neck dissection.

  - Heller KS, et al: Value of fine needle aspiration biopsy of salivary gland masses in clinical decision-making. American J of Surgery 164:667-70, 1992



Treatment of Major Salivary Gland Cancer

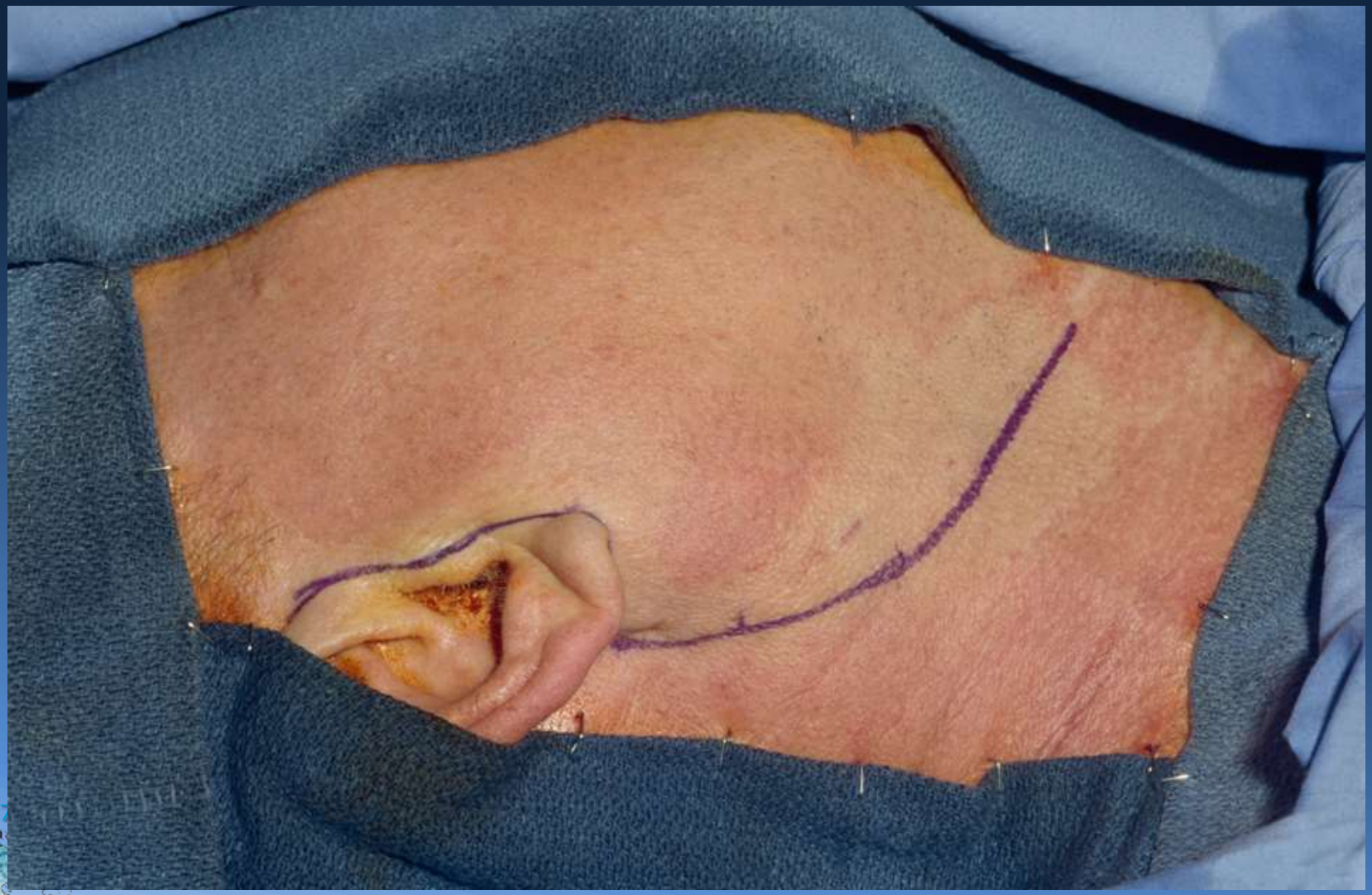
Principles of management

- Resect disease to negative margins whenever possible.
- Therapeutic neck dissection for clinically positive necks.
- Elective neck dissection for select indications.
- Adjuvant radiotherapy in select cases.
- Chemotherapy under study

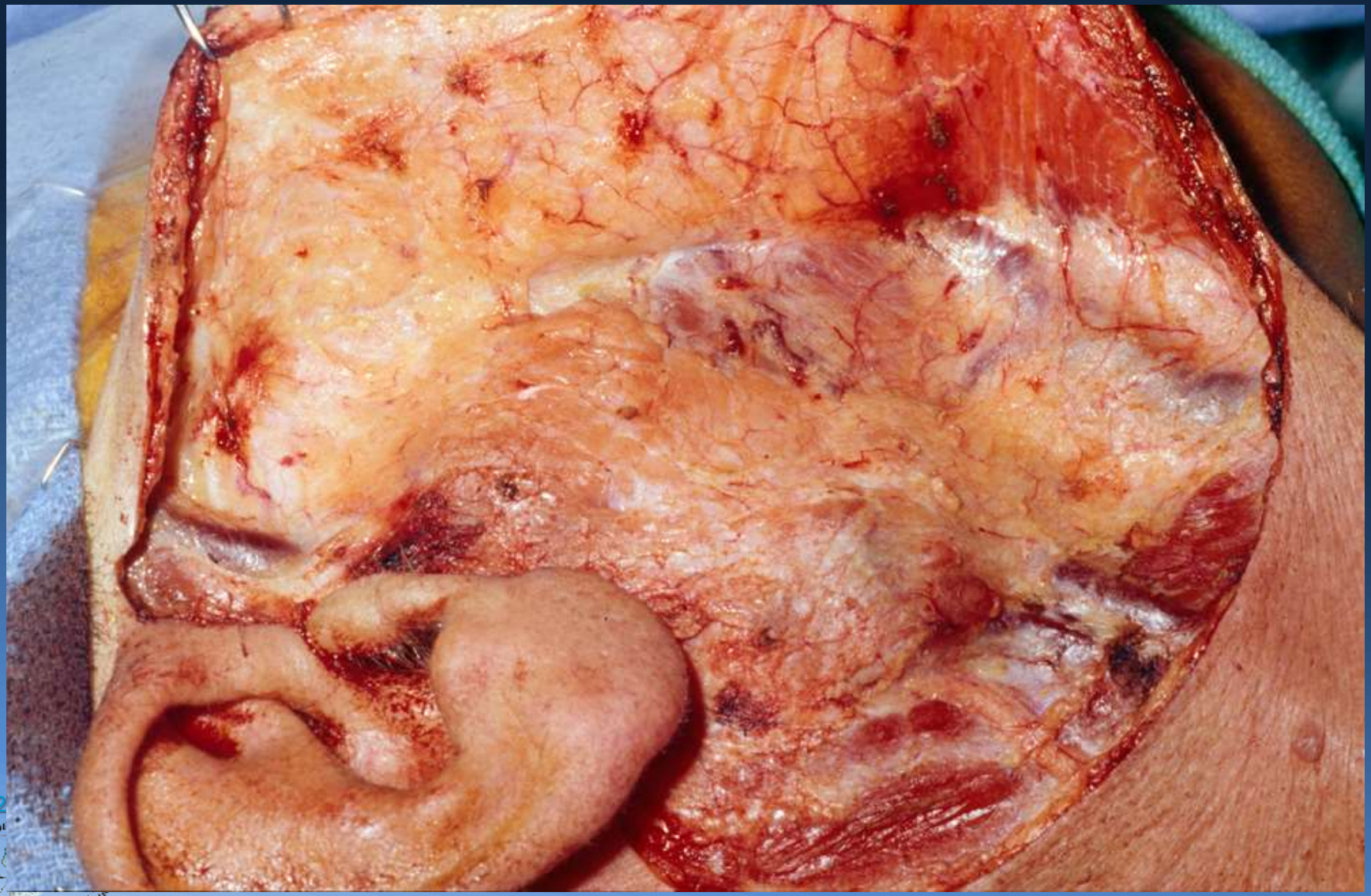
Parotidectomy Extent of Resection?

- Partial Parotidectomy
  - Small, localized, lesions of the parotid (usually tail)
  - Adequate cuff of normal parotid tissue
- Lateral Lobe "Superficial" Parotidectomy
  - Larger tumors of the superficial lobe
- Total Parotidectomy
  - Tumors extending to the deep lobe
  - Tumors with intra-parotid LN metastasis
- Extended Parotidectomy
  - Skin
  - Ear and temporal bone
  - Mandible
  - Parapharyngeal space
  - Infratemporal fossa

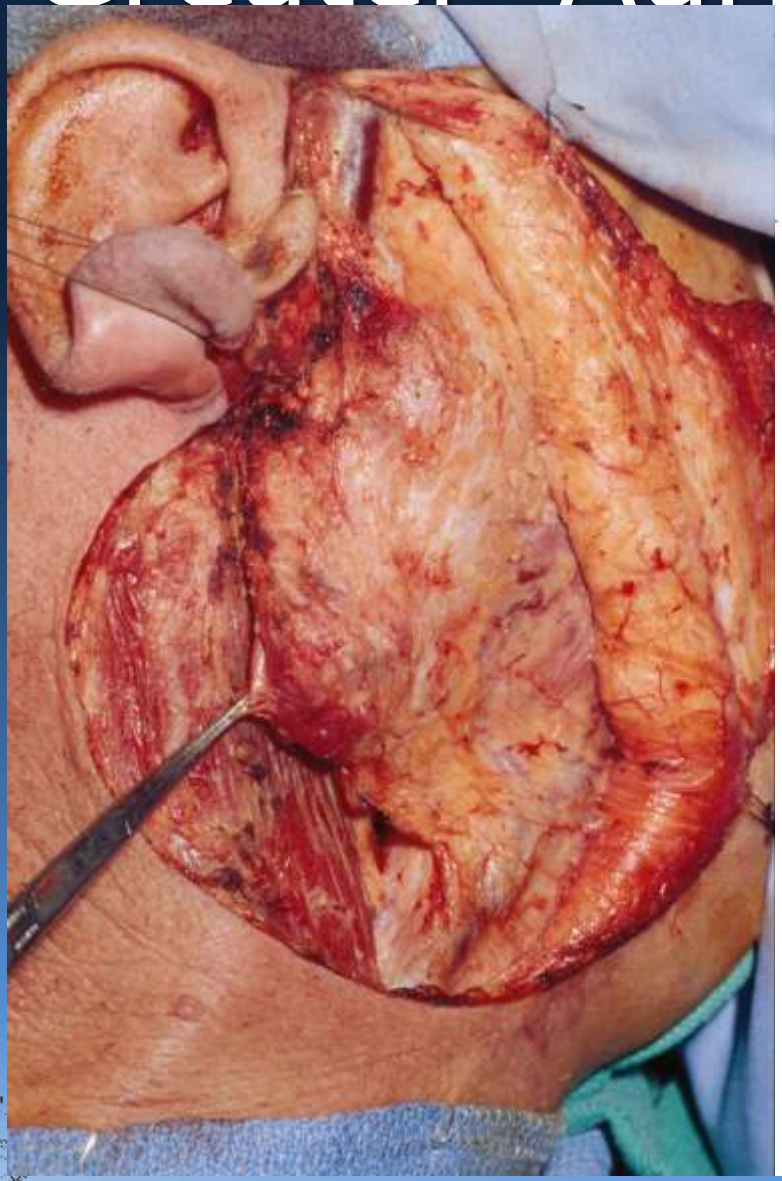
Parotidectomy Incision

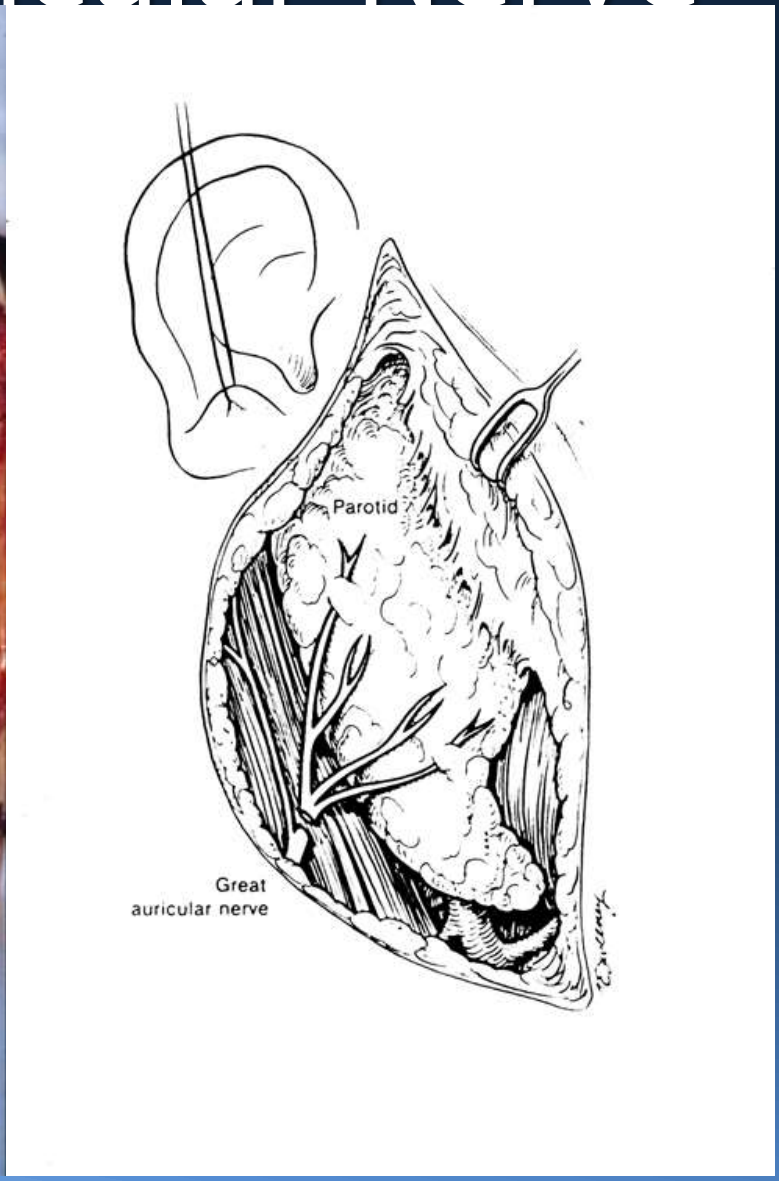


Flap Elevation

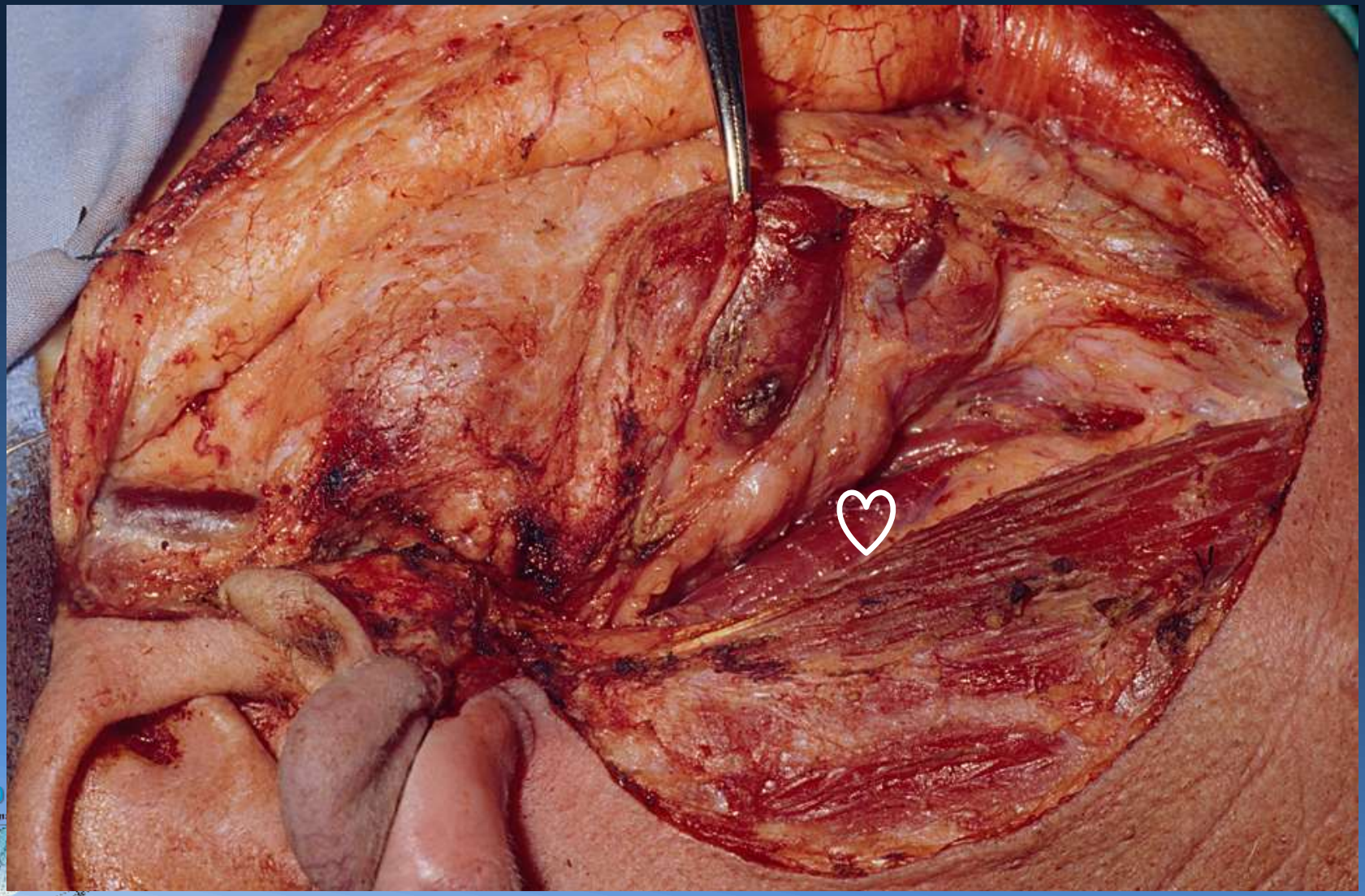


Greater Auricular Nerve

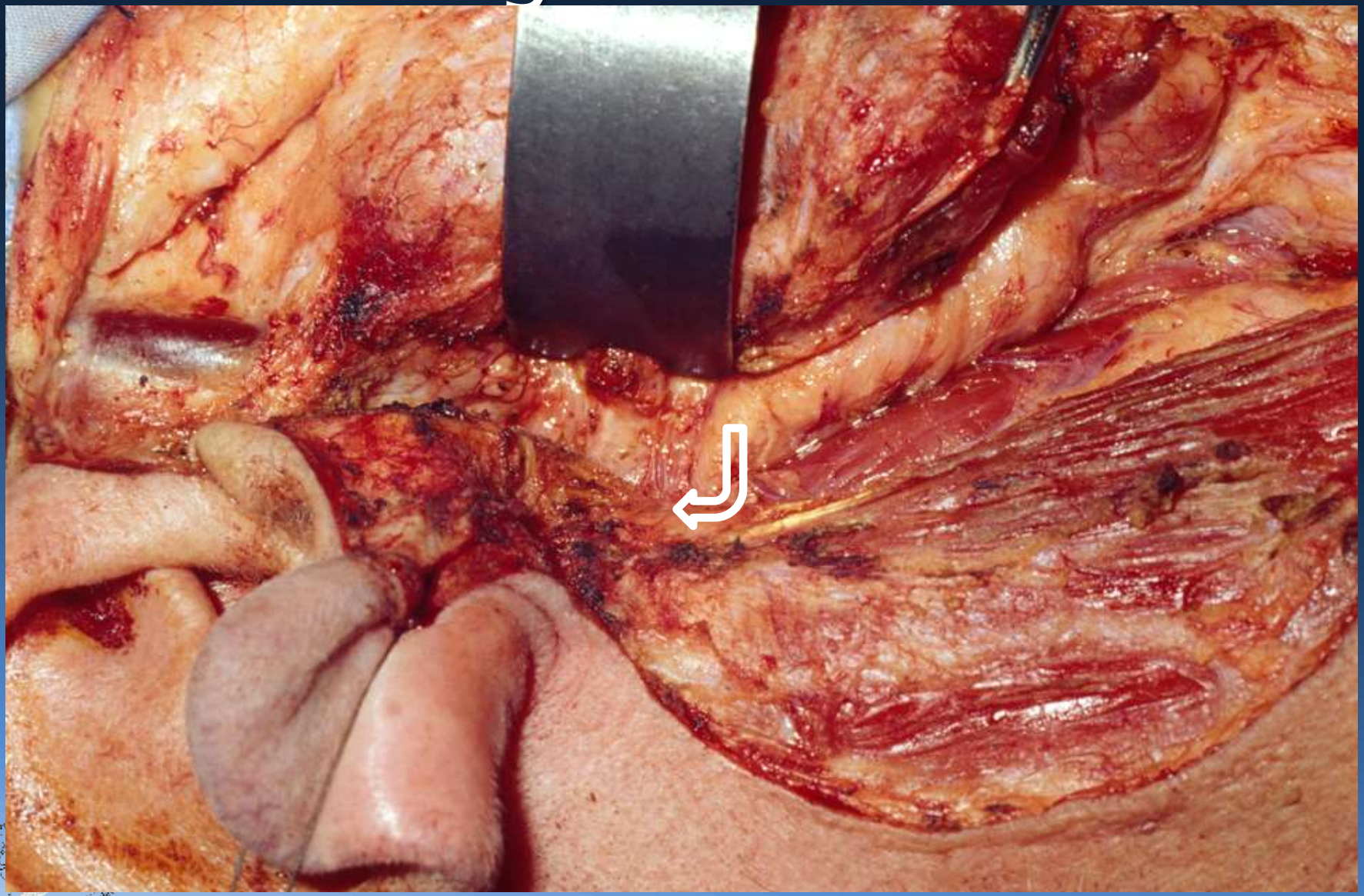




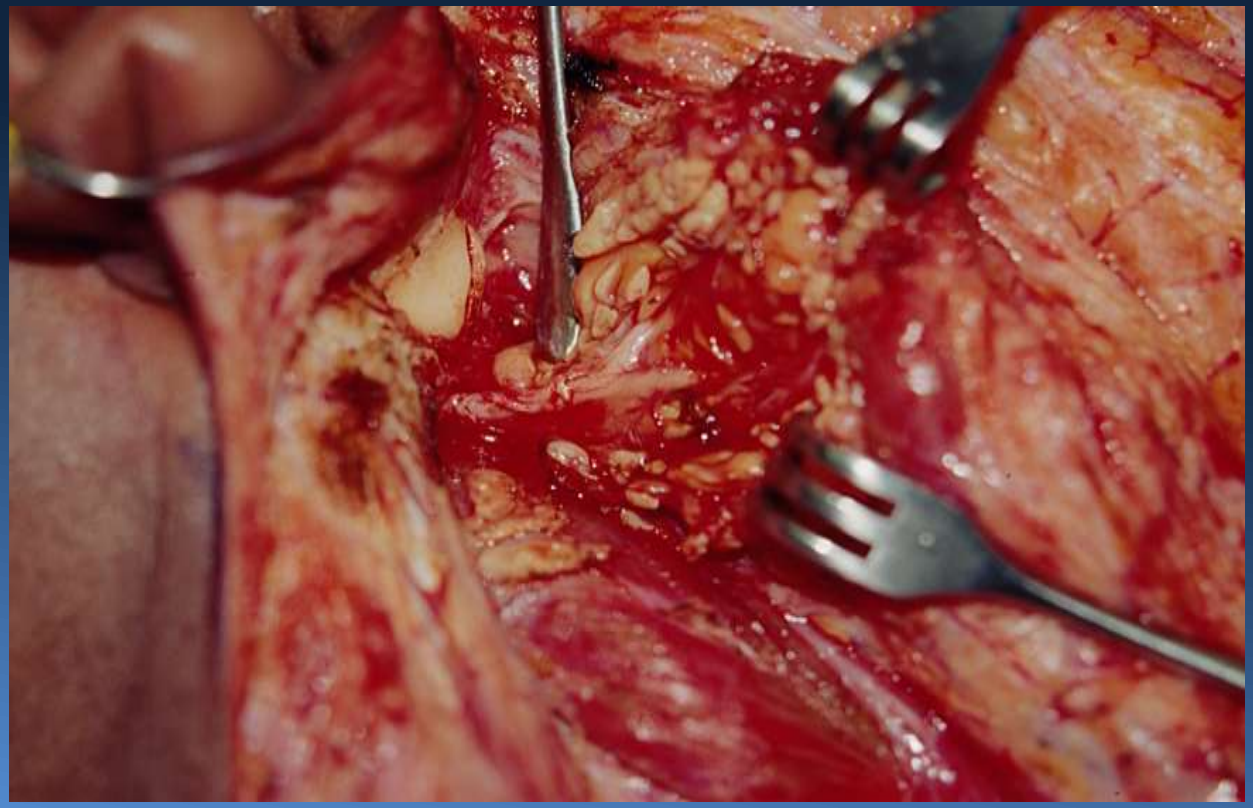
Posterior Belly of Digastric Muscle



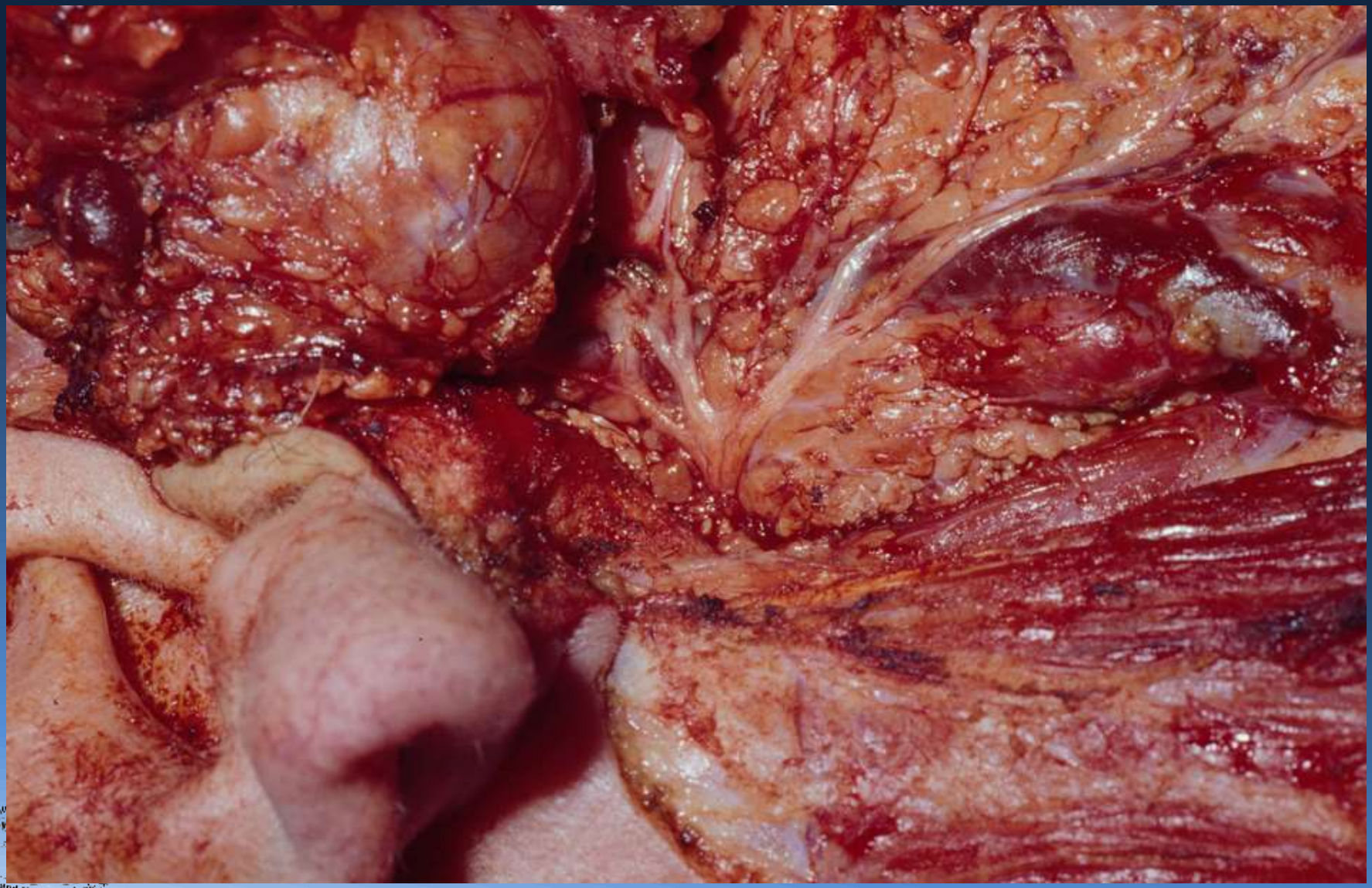
Tragal Pointer



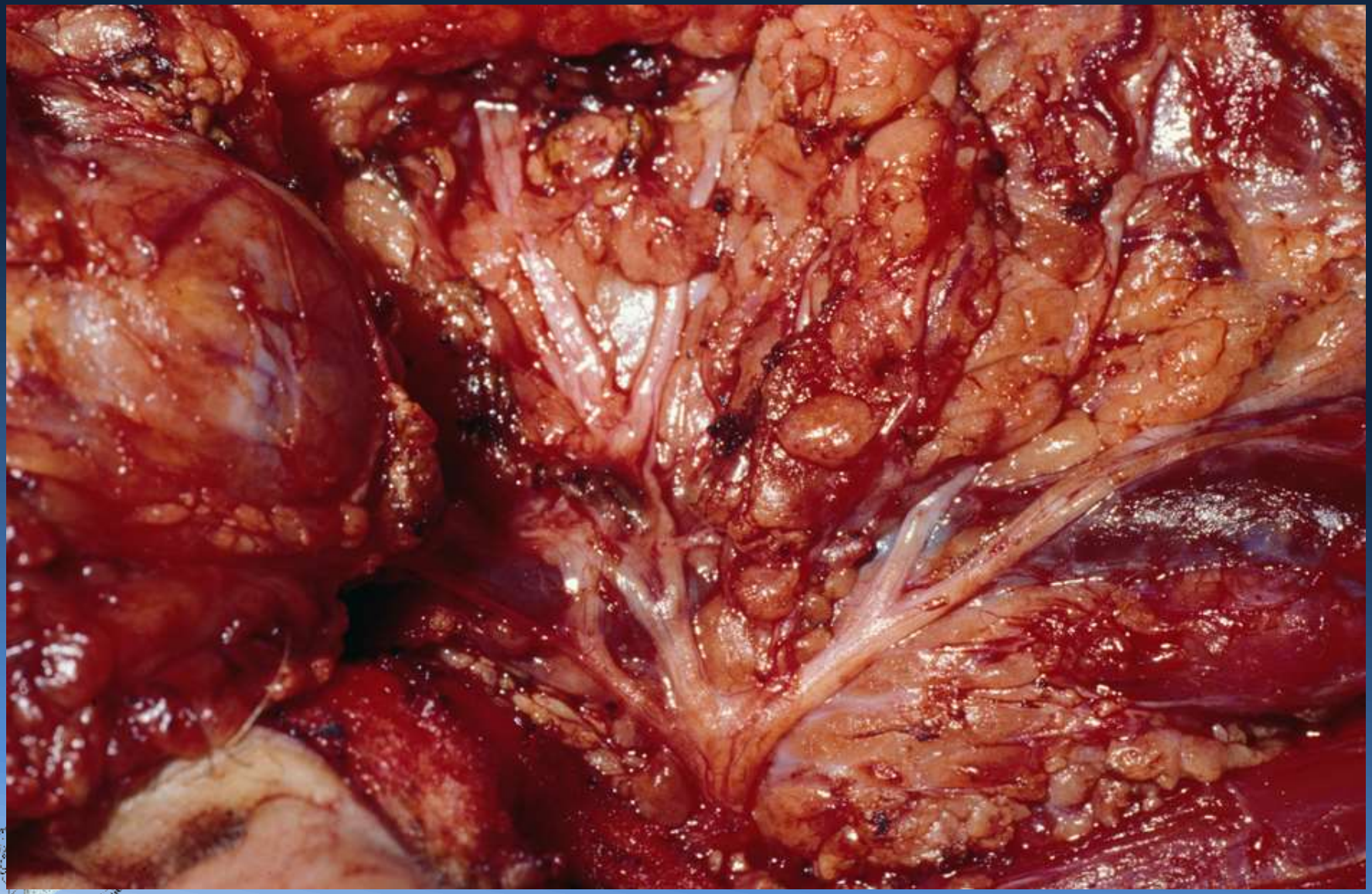
Identification of Main Trunk of the Facial Nerve



Inferior Division of the Facial Nerve



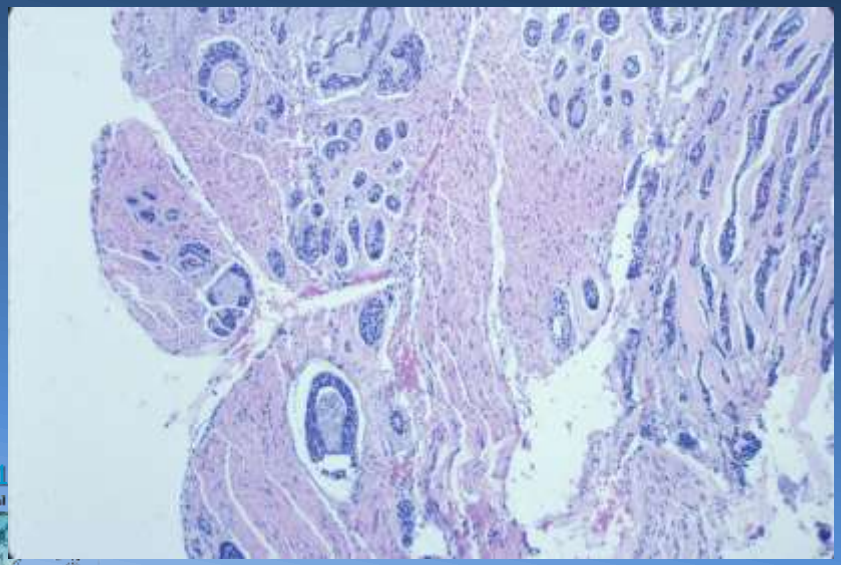
Superior Division of the Facial Nerve

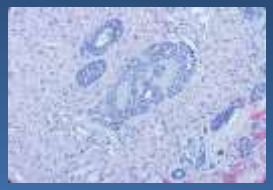


Removal of the lateral "superficial" lobe

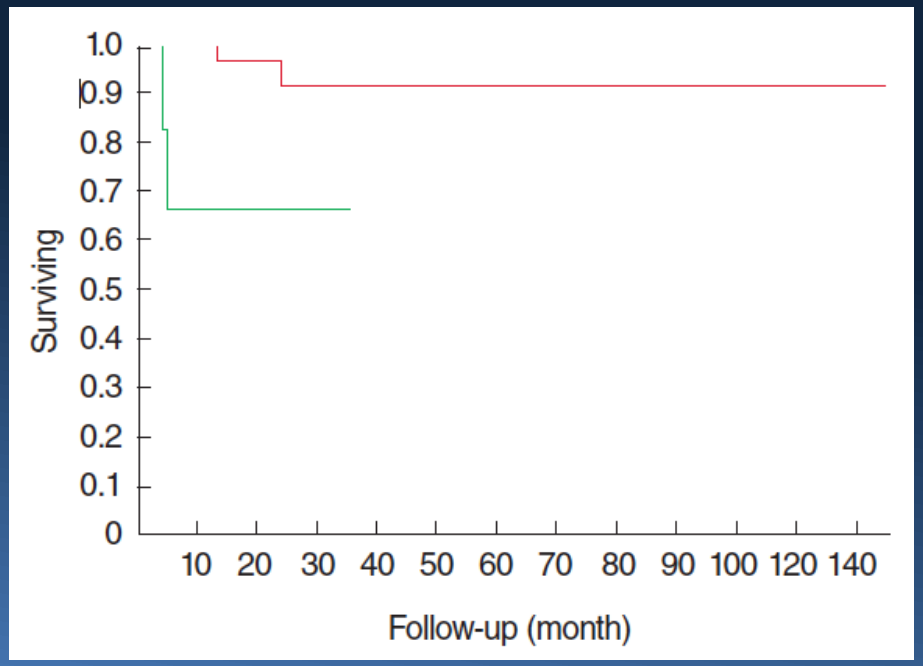
Management of the Facial Nerve

- The facial nerve is dissected and preserved unless
  - Directly involved by the tumor
  - Facial paralysis or paresis prior to surgery
- Nerve Margins

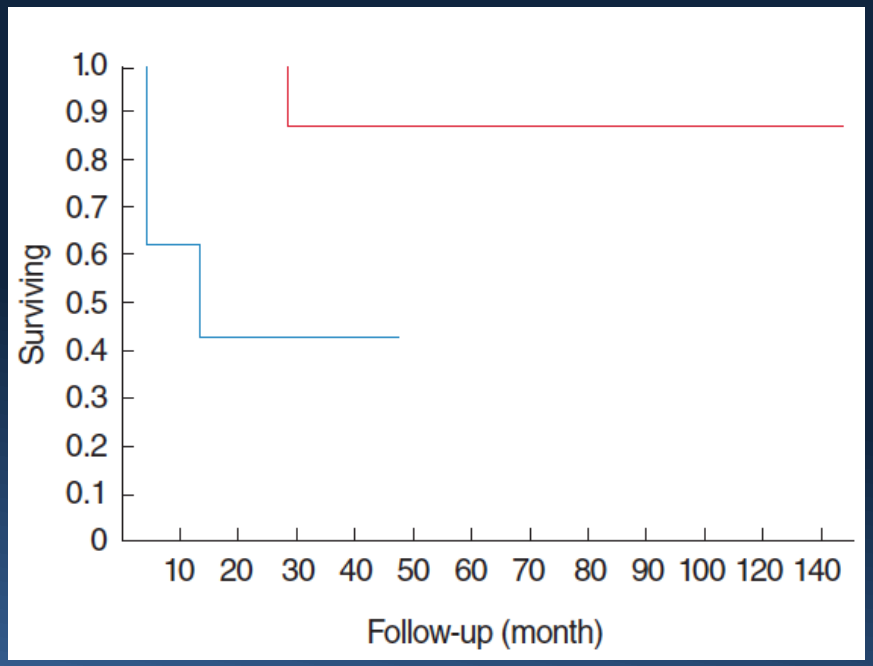




Management of the Facial Nerve Rationale



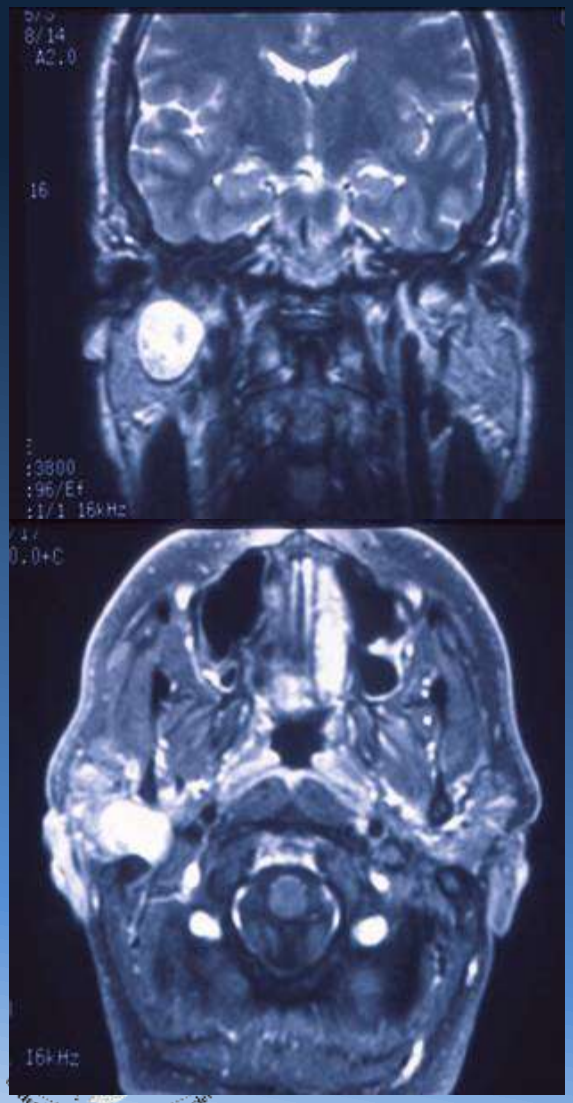
Preoperative Facial Paresis

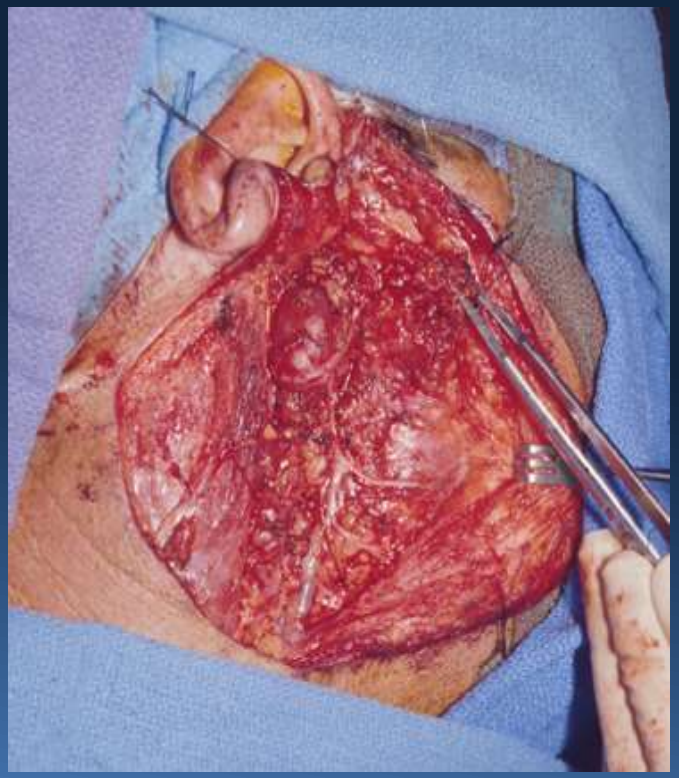


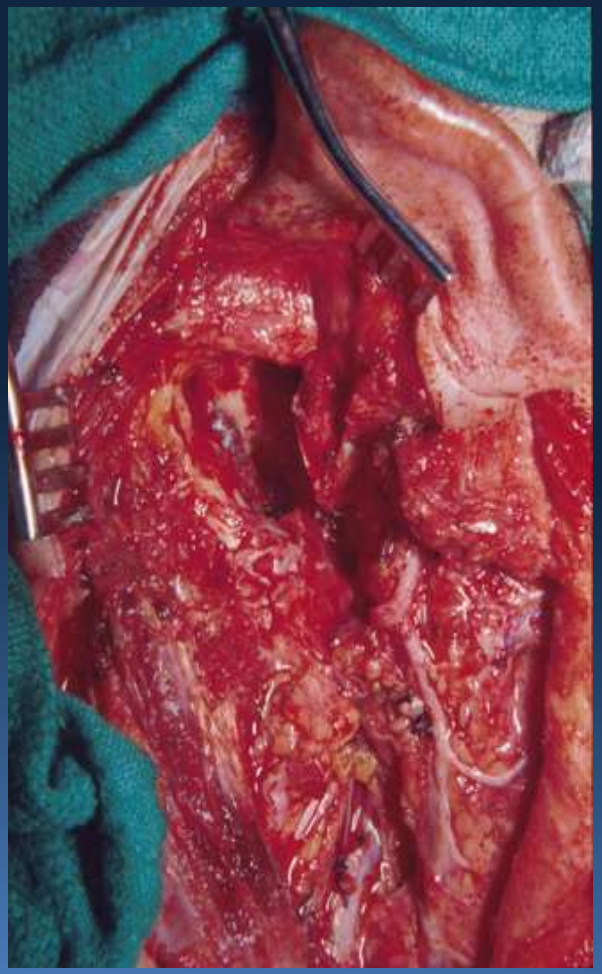
Involvement of surrounding structures

Clinical History, Prognostic Factors, and Management of Facial Nerve in Malignant Tumors of the Parotid Gland. Bussu F. et al *Clinical and Experimental Otorhinolaryngology* Vol. 7, No. 2: 126-132, June 2014

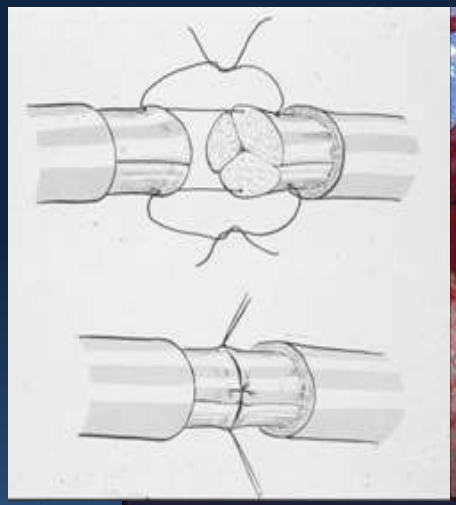
Resection of the Facial Nerve

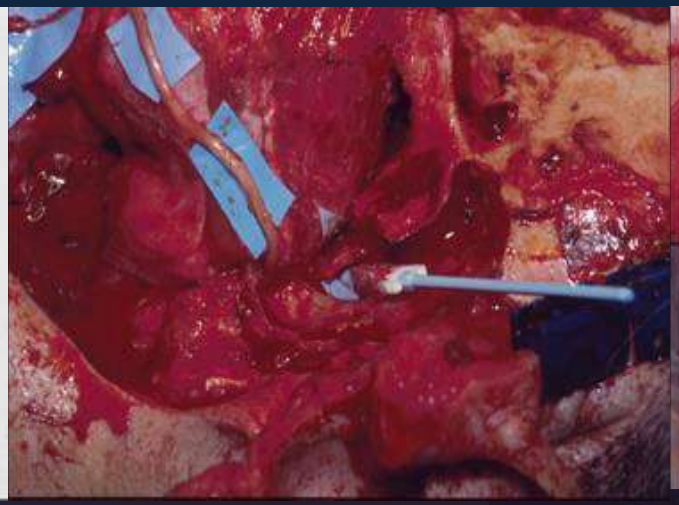


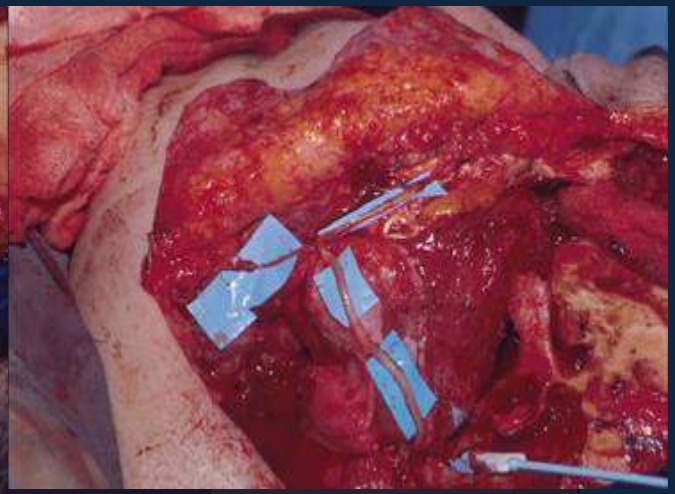




Nerve Graft







Facial Nerve Rehabilitation

- If the facial nerve is sacrificed
  - Nerve anastomosis or Cable grafts
  - Eye care
  - Gold weight
  - Tarsal strip canthoplasty
  - Trasorrhaphy
  - Brow lift
  - Static slings
  - Dynamic reanimation

Facial Nerve Monitoring

	Postoperative Outcome, n (%)*					
	Normal Function		Facial Paralysis			
Surgical Technique	EMG Group	Control Group	EMG Group	Control Group	All	*P*
Superficial parotidectomy	29 (71)	22 (58)	12 (29)	16 (42)	79	*P* = 0.23
Total parotidectomy	2 (22)	6 (50)	7 (78)	6 (50)	21	*P* = 0.21

	Time, Average±SD (min)				
Surgical Technique	EMG Group	Control Group	All	n	*P*
Superficial parotidectomy	115.3±37.4	141.2±53.9	129.5±48.7	69	*P* =.04
Total parotidectomy	140.0±67.4	147.3±44.3	144.5±51.7	13	*P* =.72
Sum[A]	118.7±42.4	142.2±52.0	131.9±49.1	82	*P* =.03

	Final Outcome, n (%)*					
	Total Recovery		Defective Healing			
Surgical Technique	EMG Group	Control Group	EMG Group	Control Group	All	*P*
Superficial parotidectomy	37 (90)	36 (95)	4 (10)	2 (5)	79	*P* =.45
Total parotidectomy	9 (100)	12 (100)	0	0	21	*P* =1.0
Sum	46	48	4	2	100	

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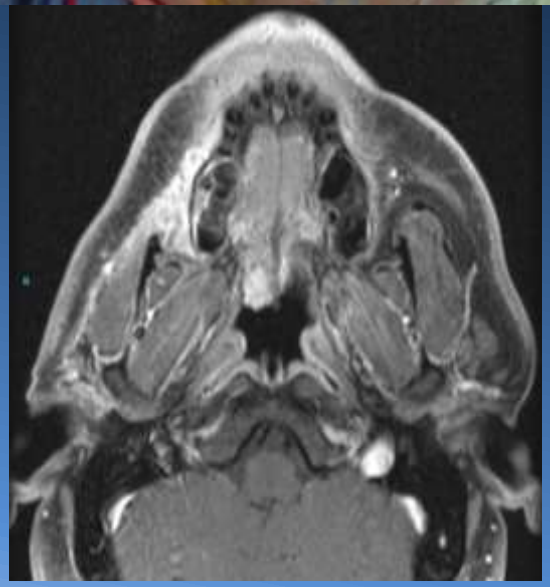
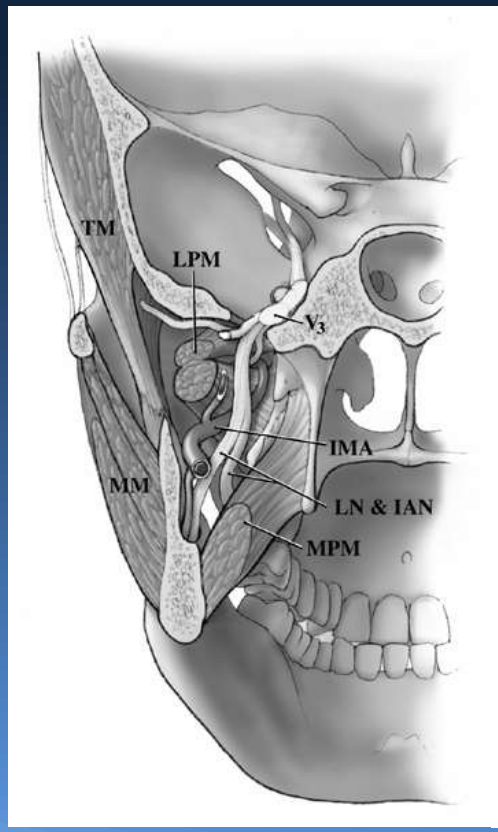
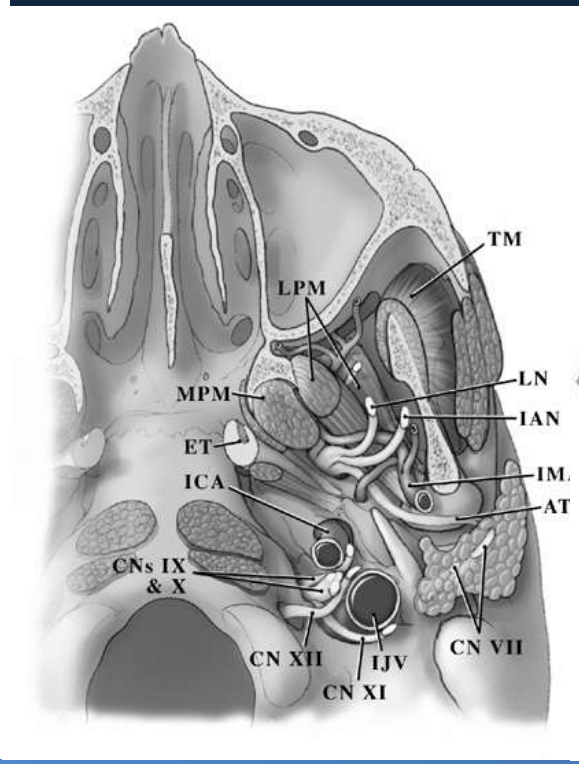
Electromyographic facial nerve monitoring during parotidectomy for benign lesions does not improve the outcome of postoperative facial nerve function: A prospective two-center trial. Grosheva et al. Laryngoscope 119: December 2009

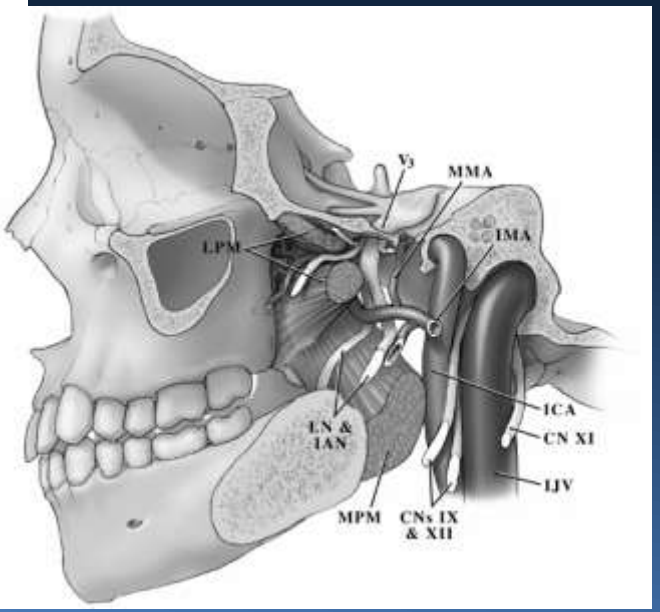
Facial Nerve Monitoring
Revision Parotidectomy



Parapharyngeal Space
Spaces and Contents







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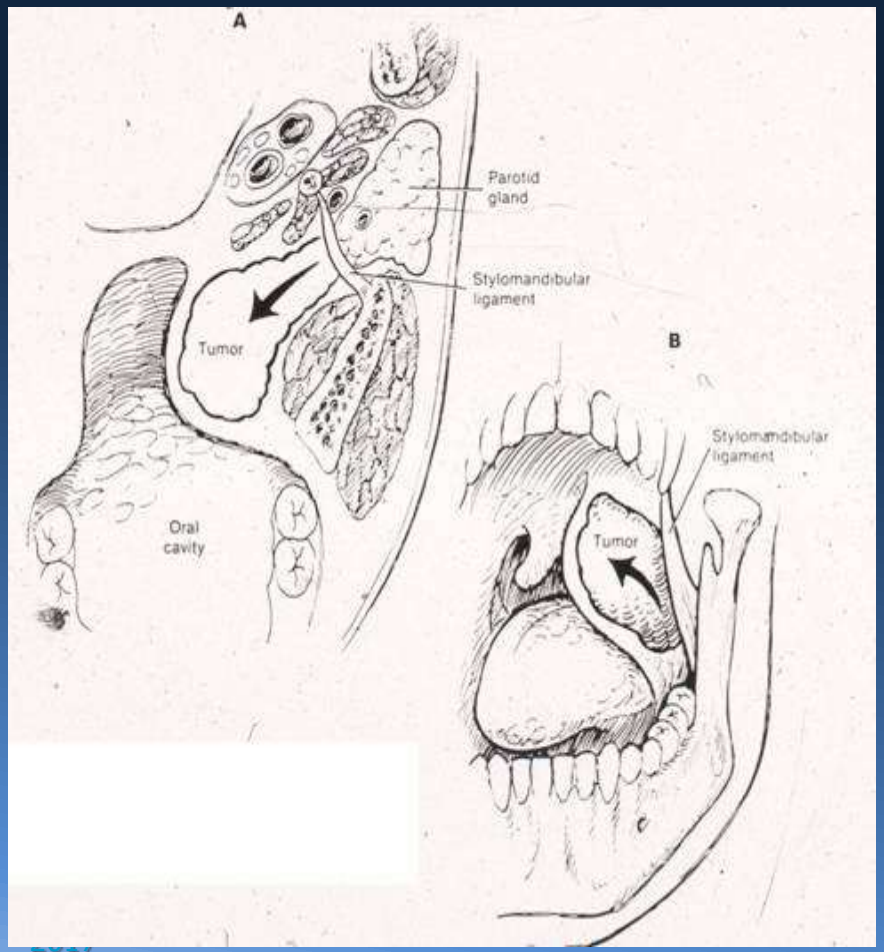
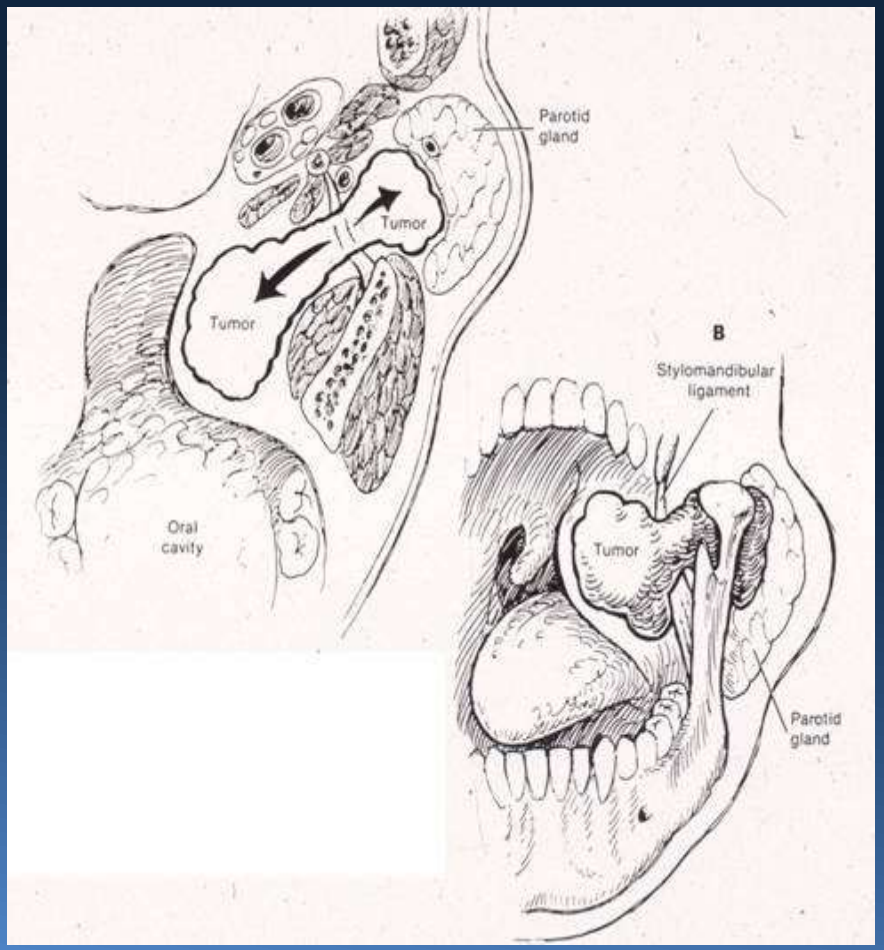
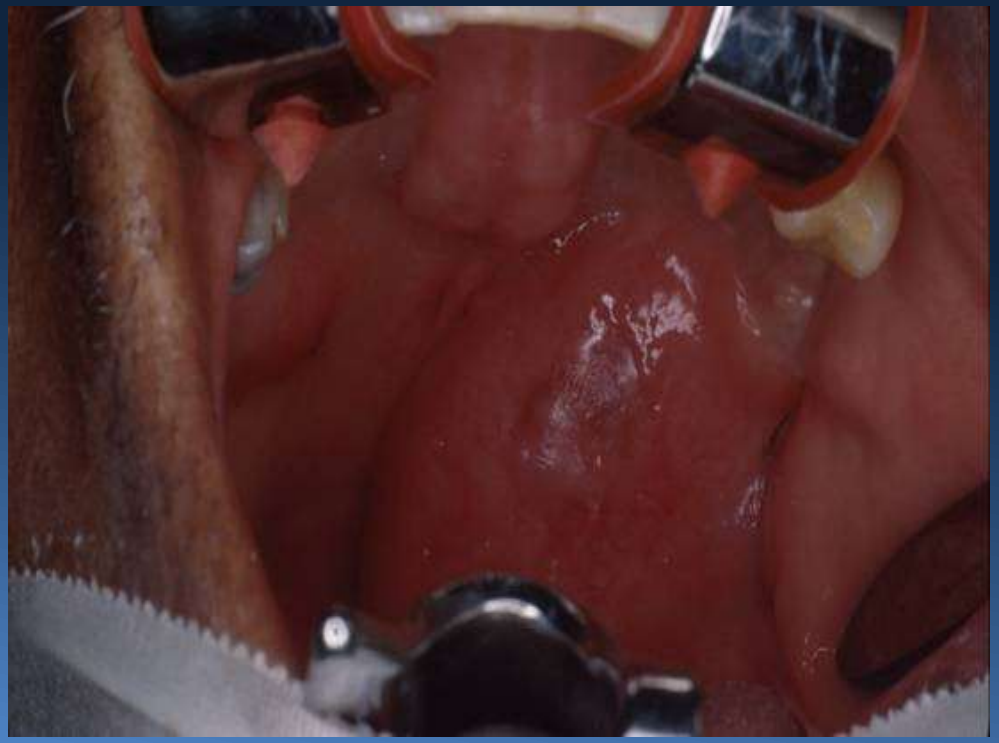
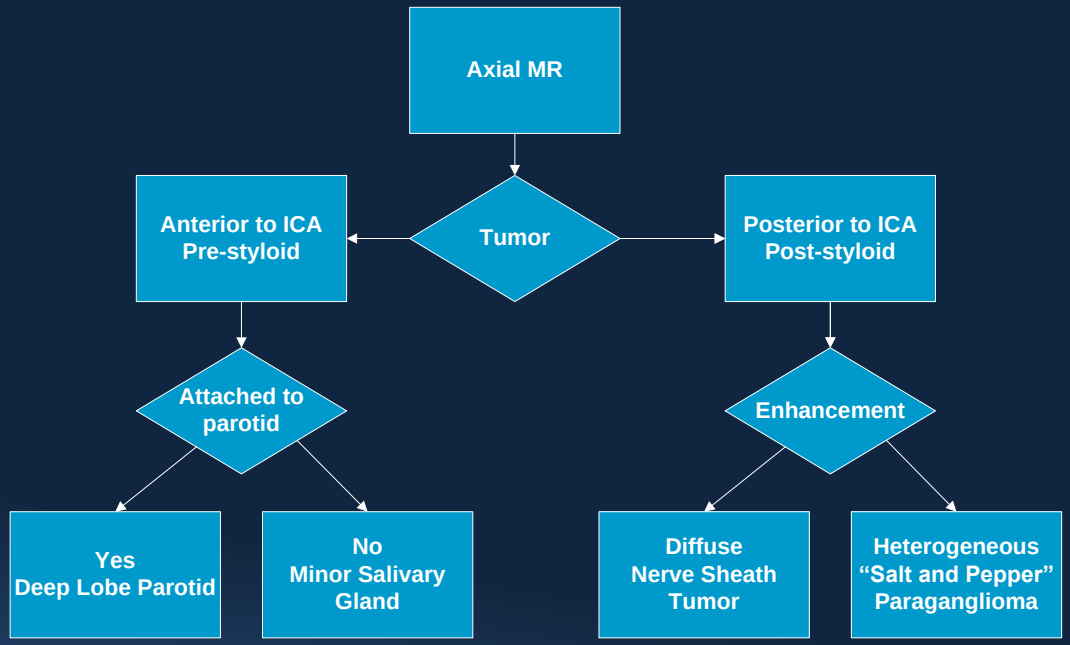
Parapharyngeal Salivary Tumors



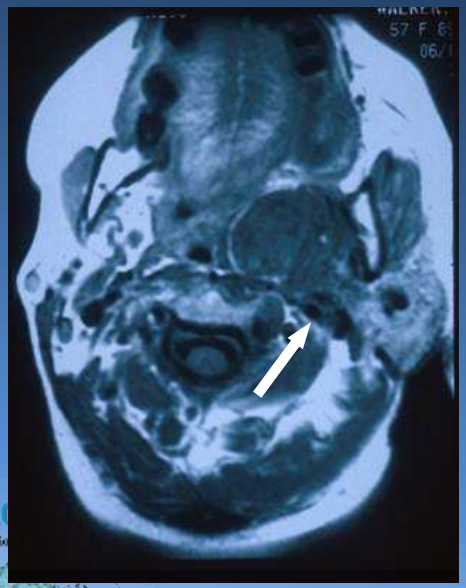


Parapharyngeal Tumors Imaging: Coronal Plane





Pre-styloid, attached to parotid



Tumor of the deep lobe parotid

Post-styloid, diffuse enhancement

Neurogenic tumor

Post-styloid, "Salt and Pepper"

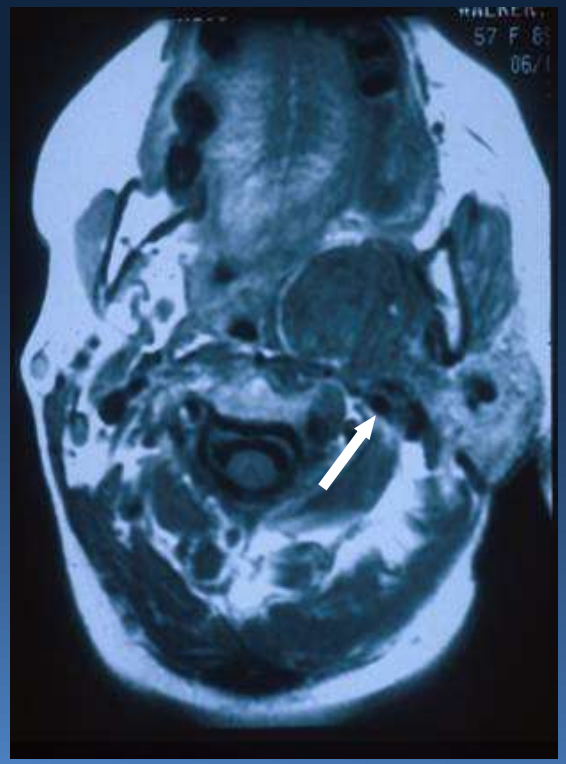
Paraganglioma

Imaging: Axial Plane
Pre-styloid or Post-styloid?
Relationship to parotid?

Enhancement?

Post-styloid, diffuse enhancement

Neurogenic tumor



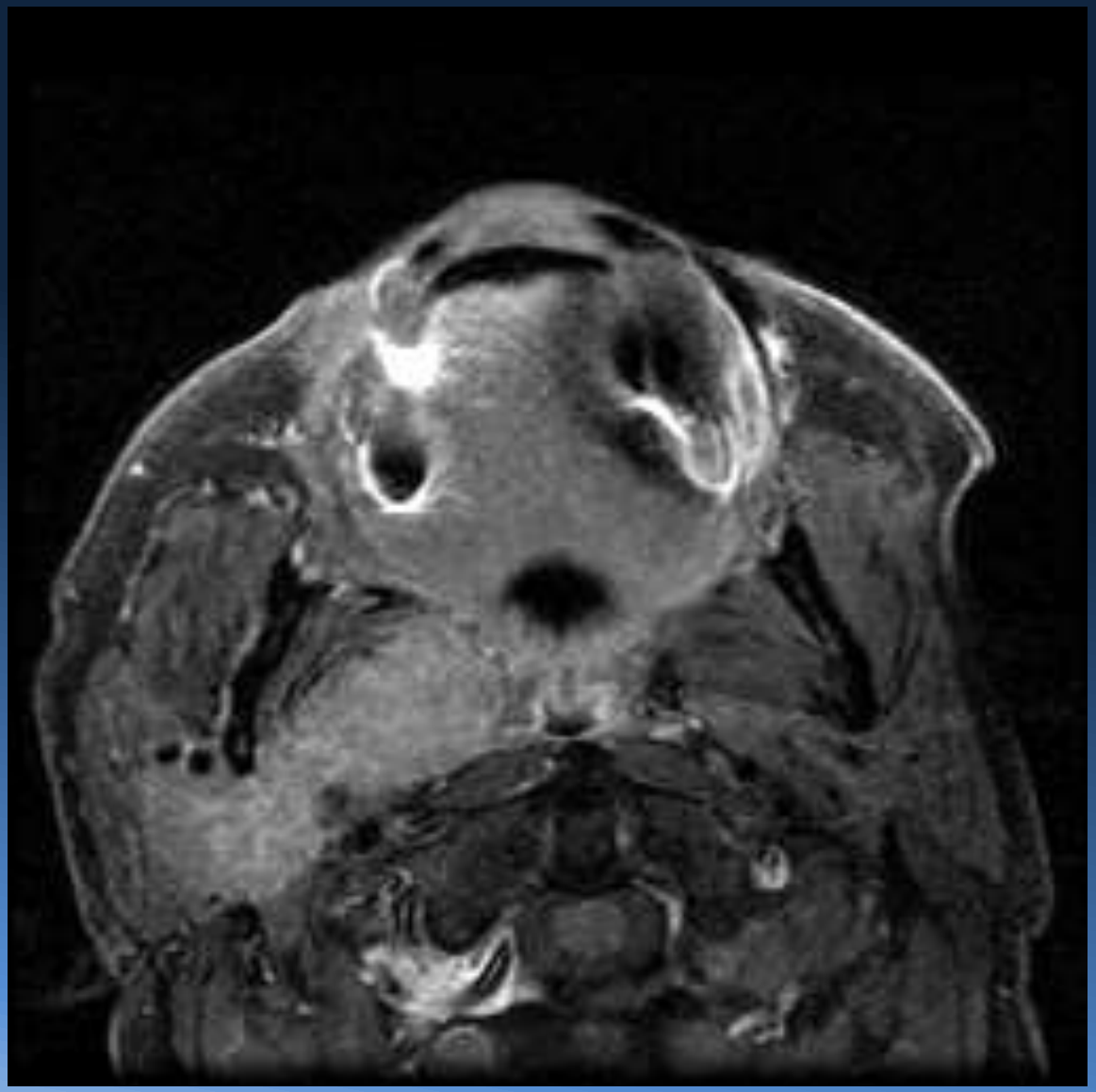
Pre-styloid, connected to parotid

Tumor of the deep lobe of the parotid

Post-styloid, non-diffuse enhancement, flow voids "Salt and Pepper"

Paraganglioma

Dumbell Tumor



Parapharyngeal Tumors Imaging: Sagittal Plane Cranial Base Extension

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Parapharyngeal Tumors Angiography

KJ (254255): parapharyngeal mass

- overall 3D reference from CT + mass from hybrid CT/MR segmentation
- parotid in blue and submandibular in green, lesion in magenta and mandible in ocre

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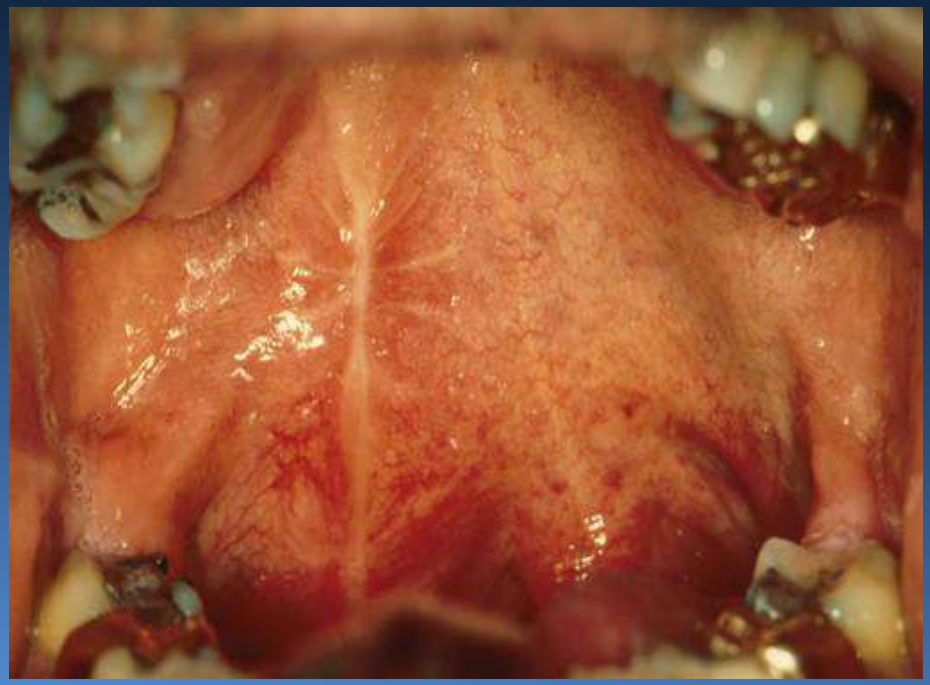
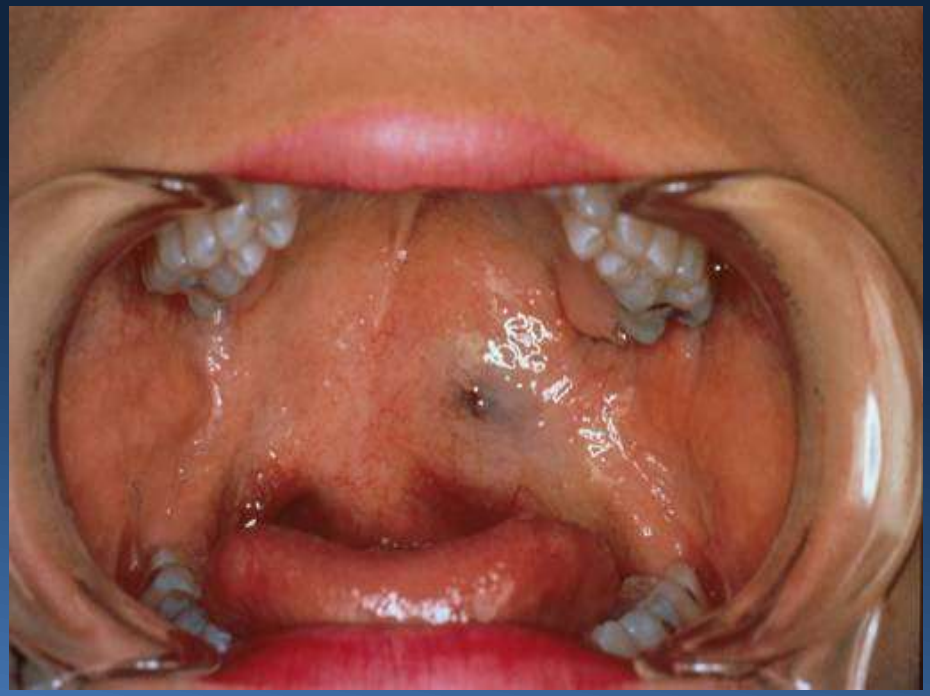
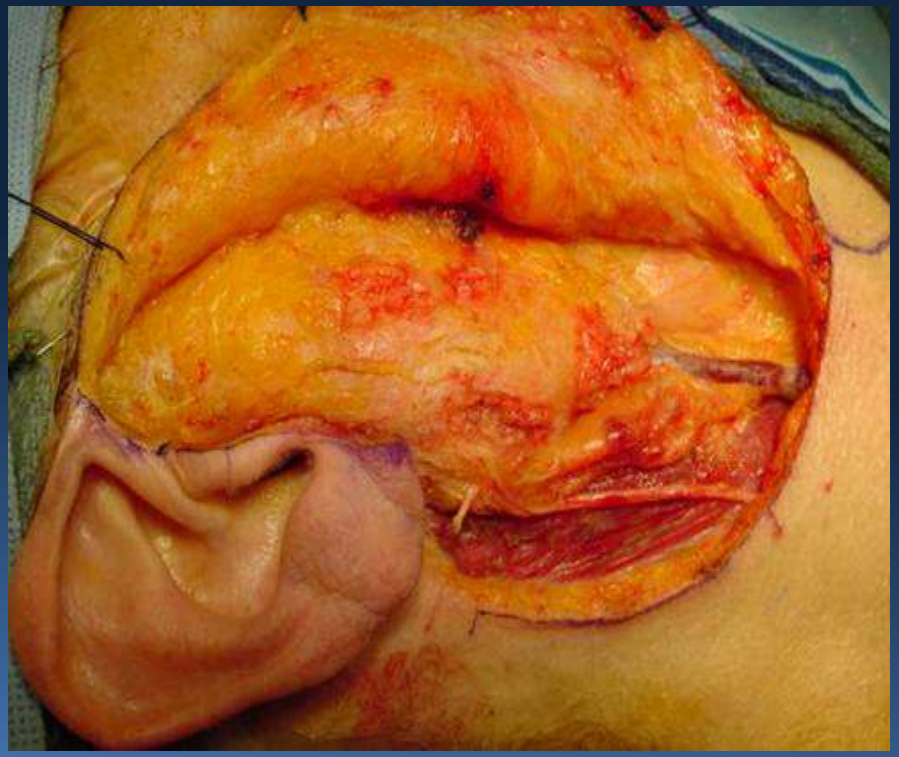
Parapharyngeal Tumors: Biopsy

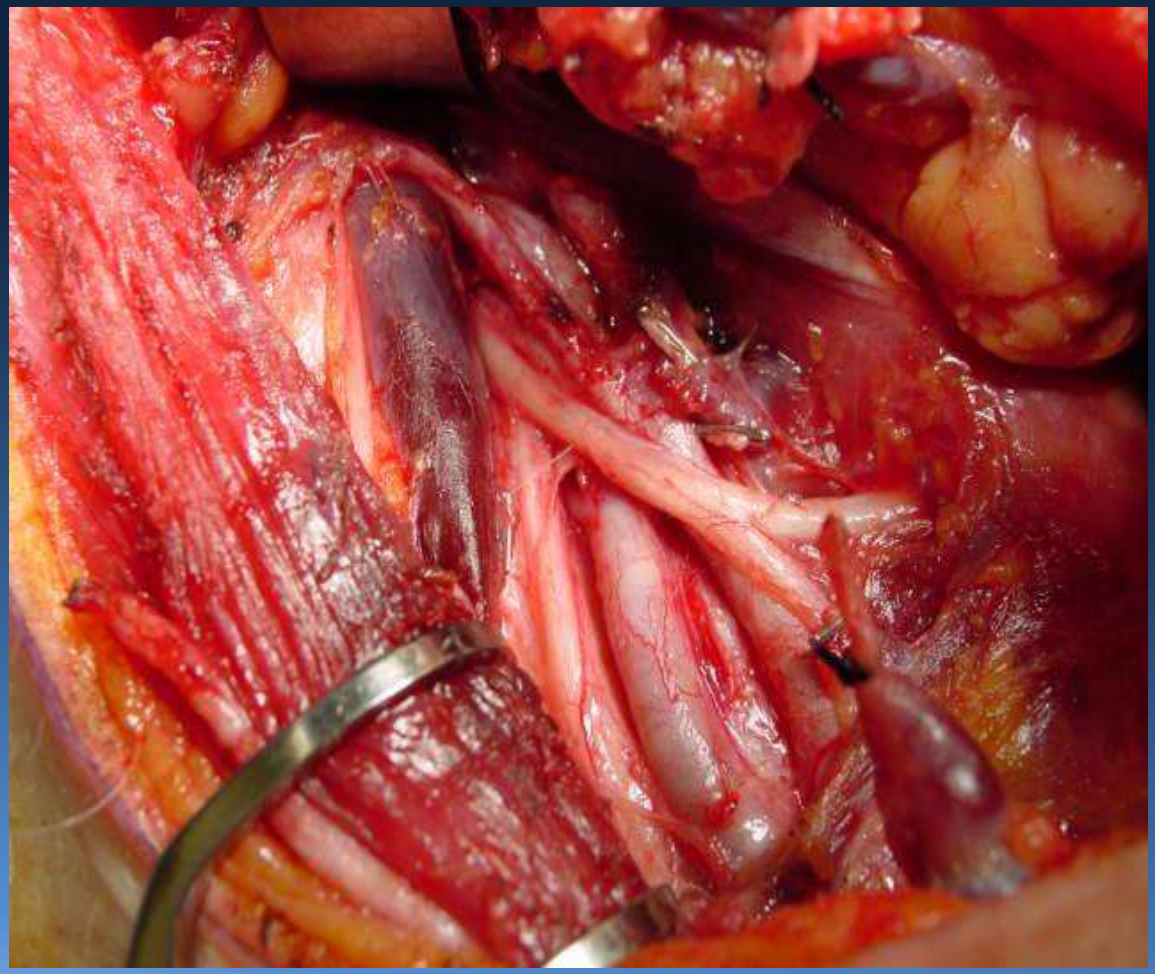




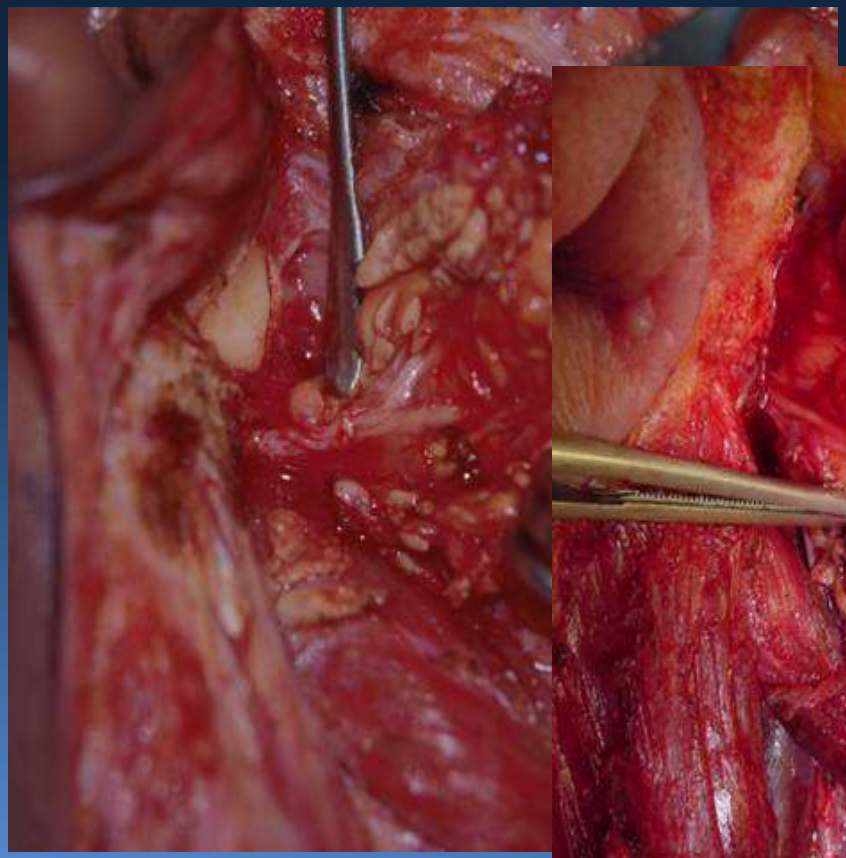
Pre-auricular trans-cervical approach Incision and Flap Elevation

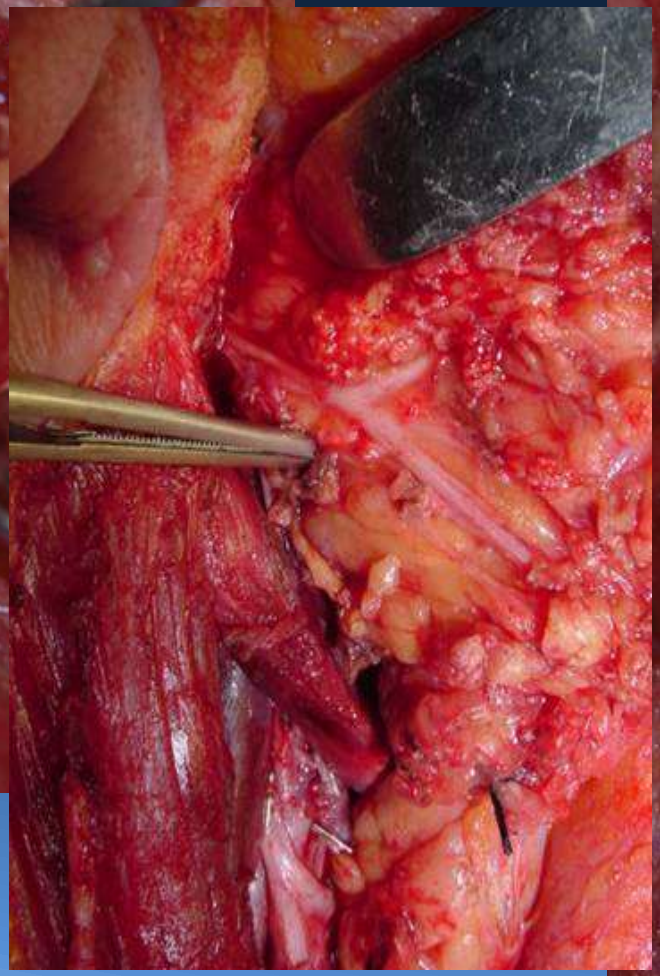


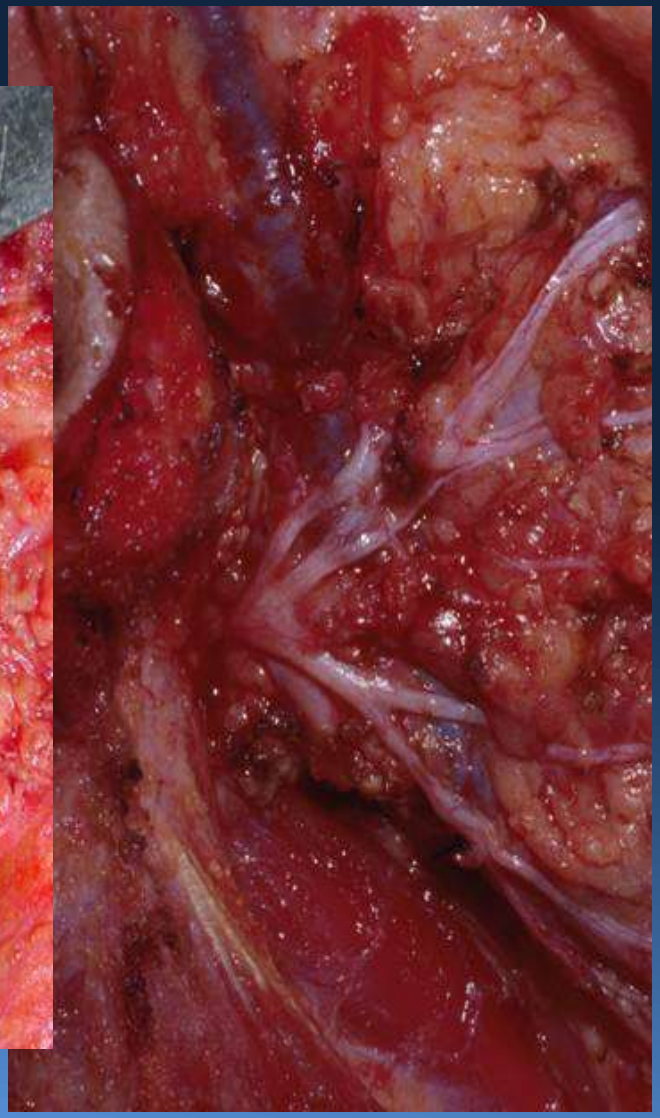
Exposure of the Carotid Sheath Contents



Management of the Facial Nerve







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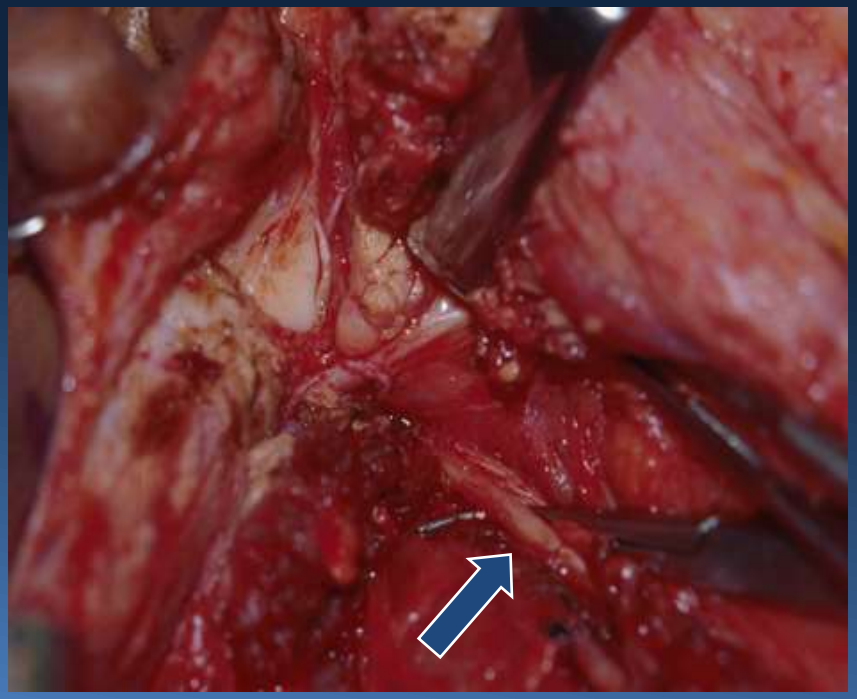
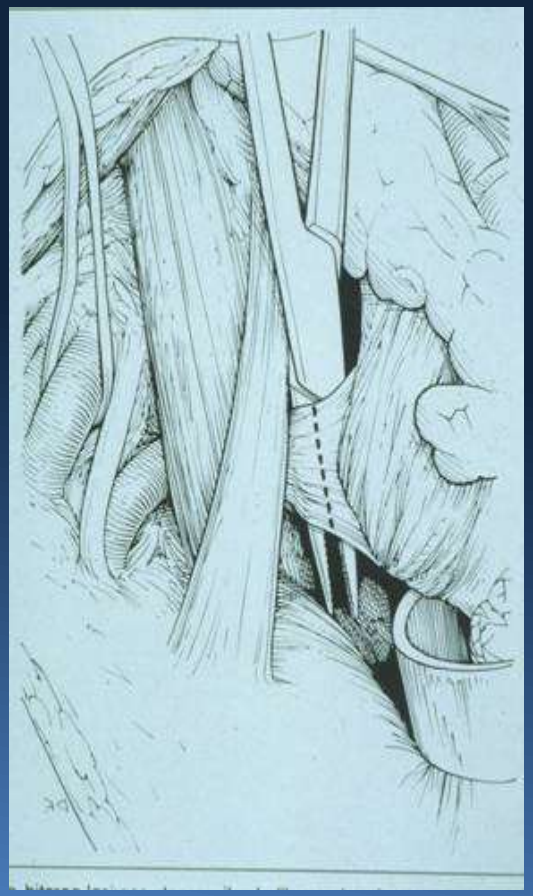
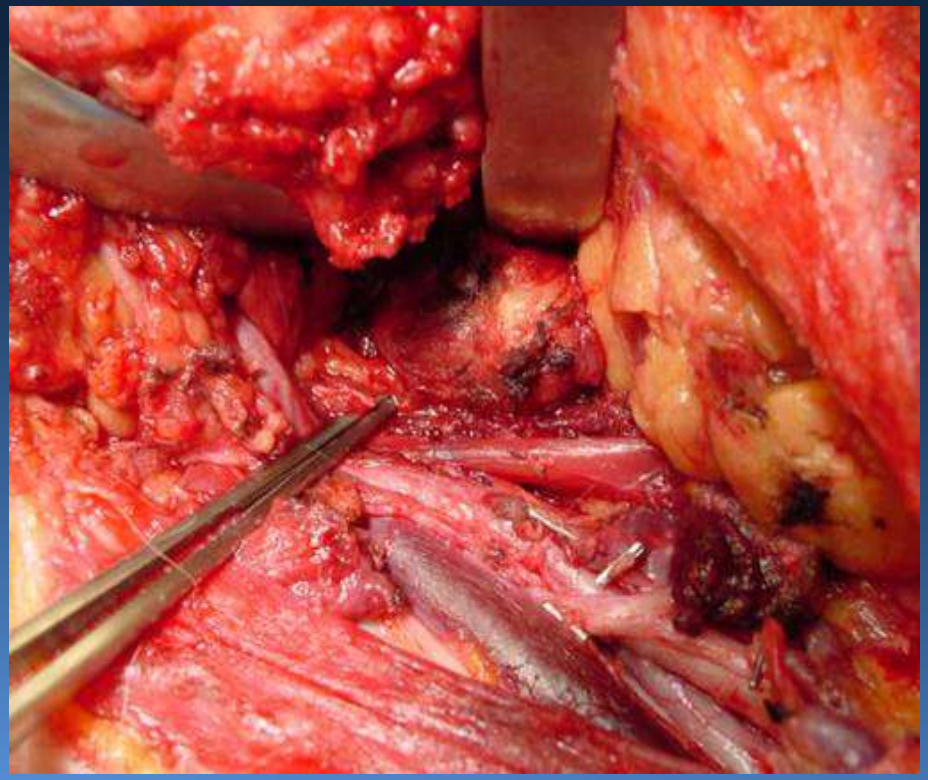
Dividing the Stylo-mandibular Ligament





Exposure of the Parapharyngeal Space and Delivery of the Tumor

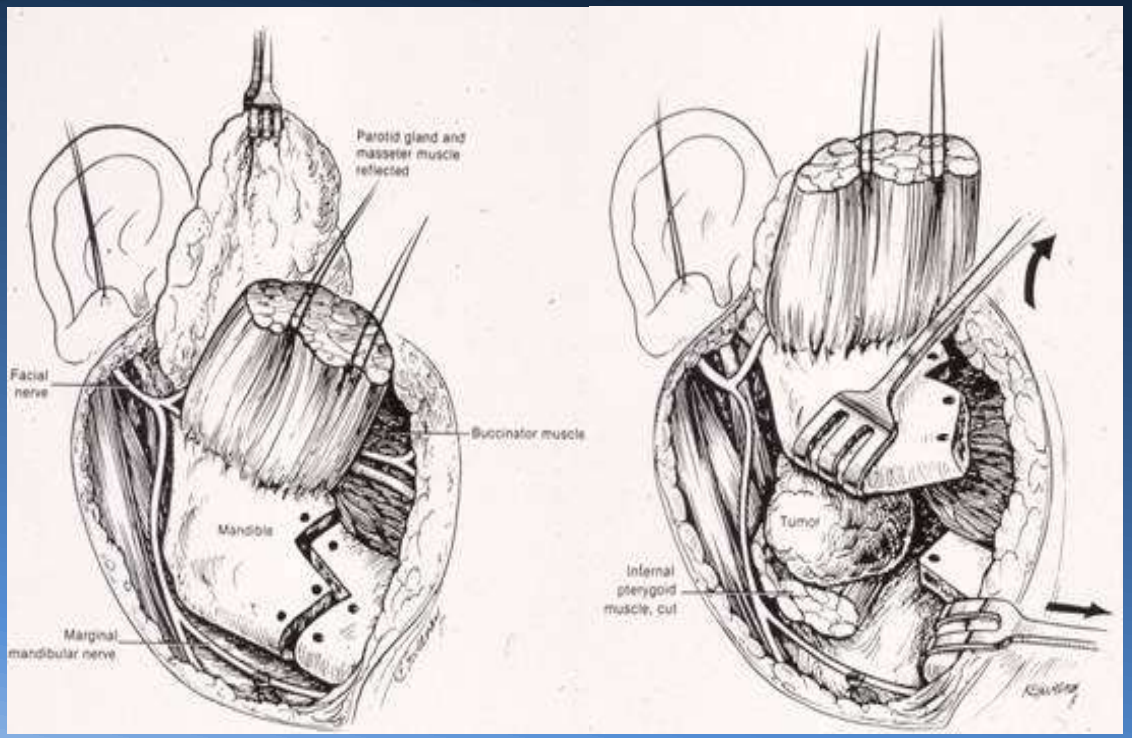



MD Anderson Cancer Center

Postoperative Appearance

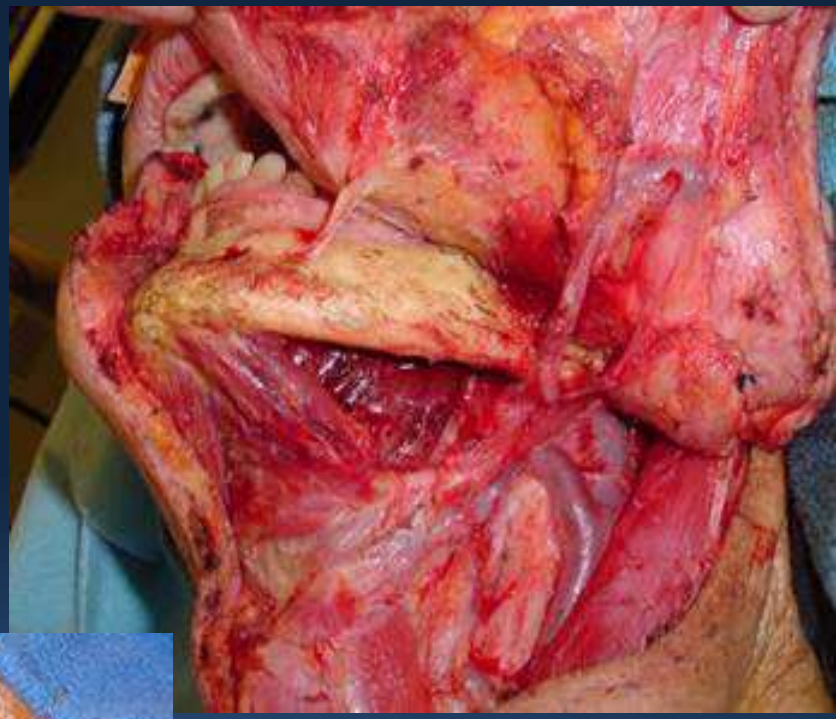
Management of the Mandible
Mandibulotomy

- High Parapharyngeal Space
- Medial Masticator Space
- Pterygo-maxillary Space

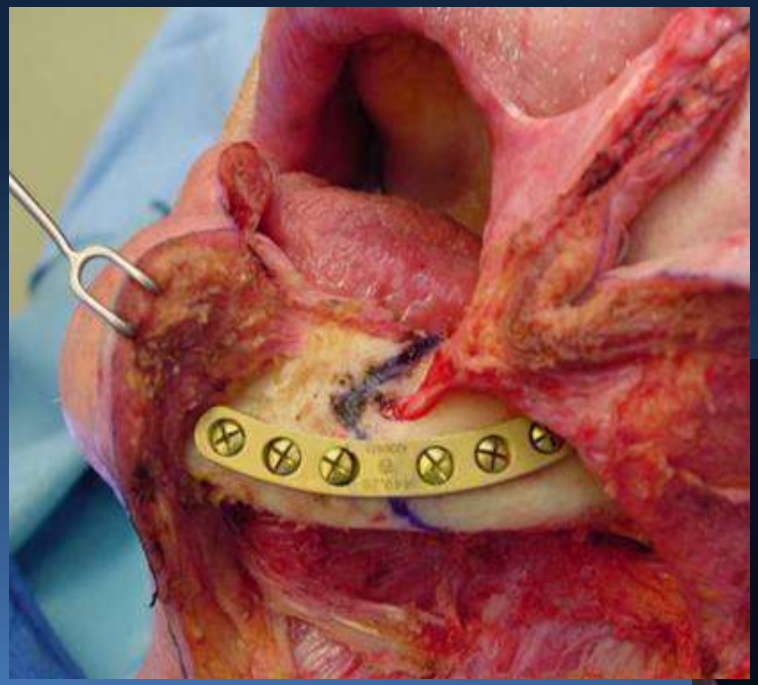


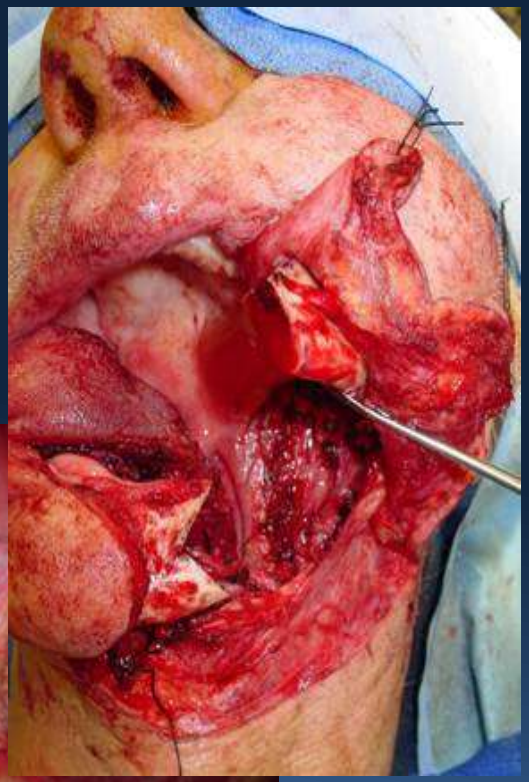
2017

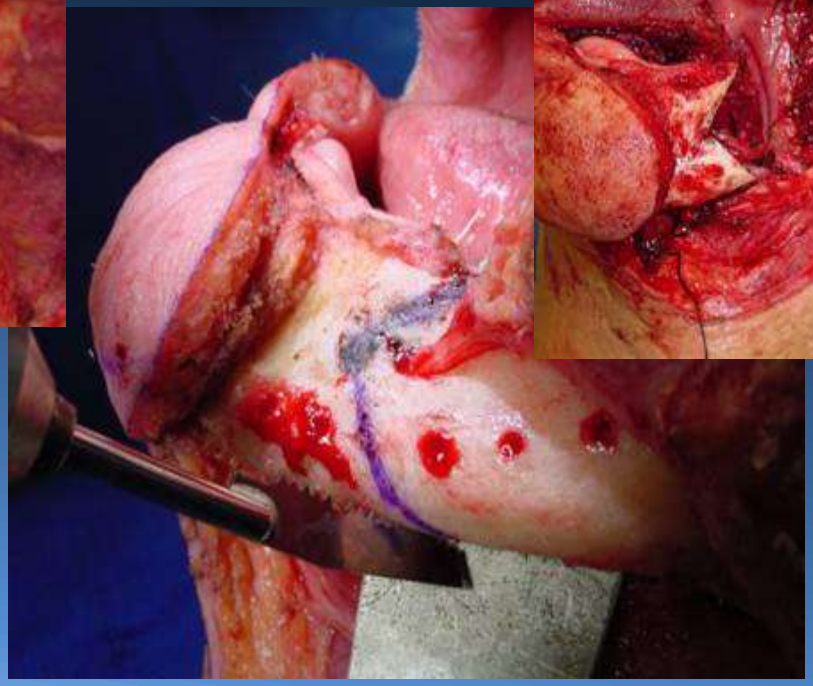
Trans-mandibular Approach



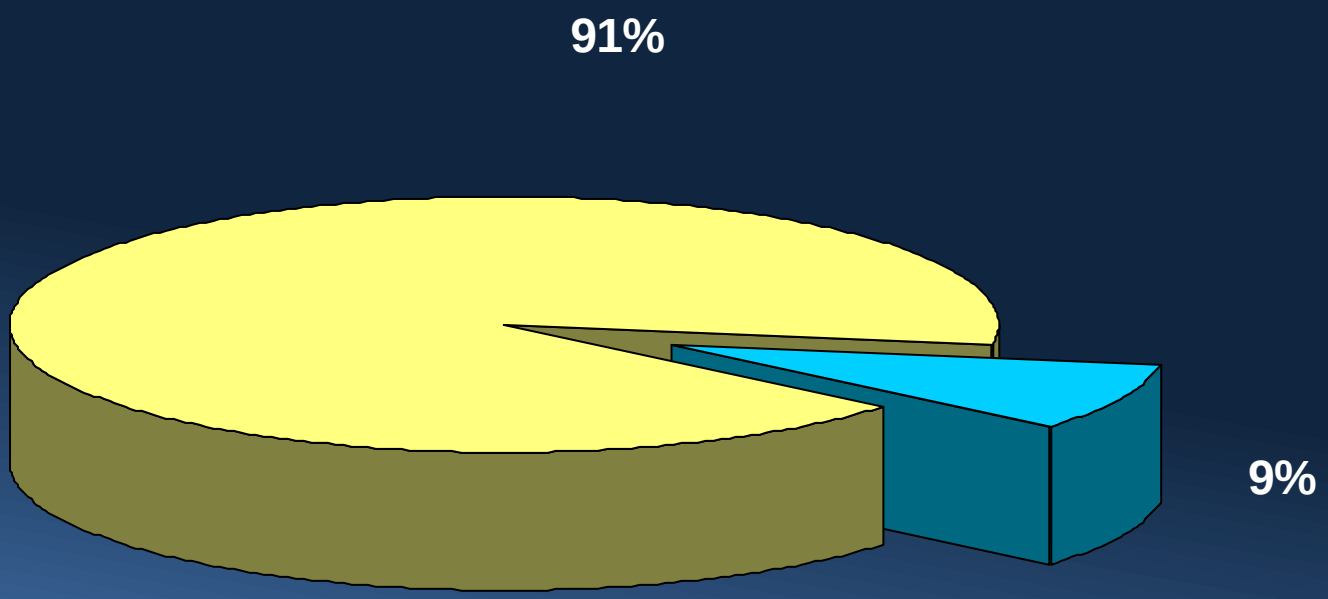
Trans-mandibular Approach



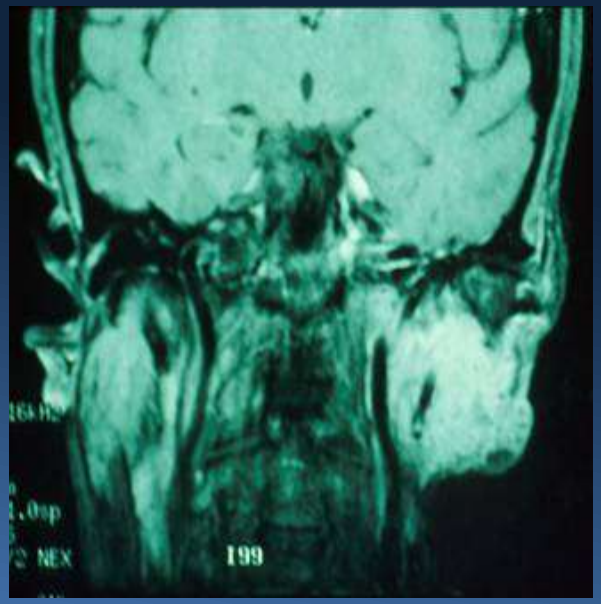


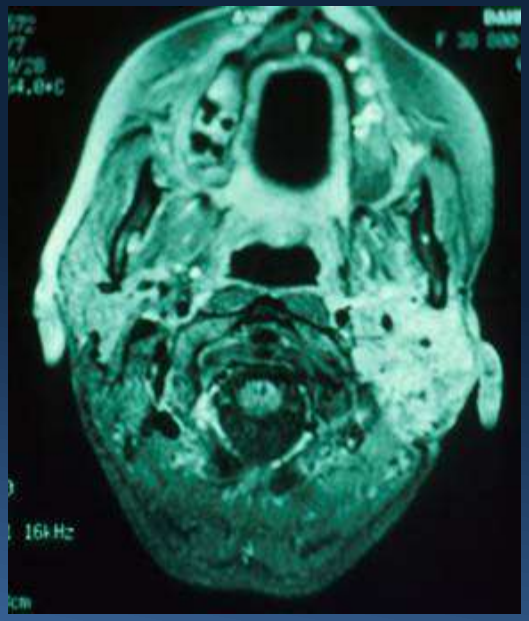


Approach



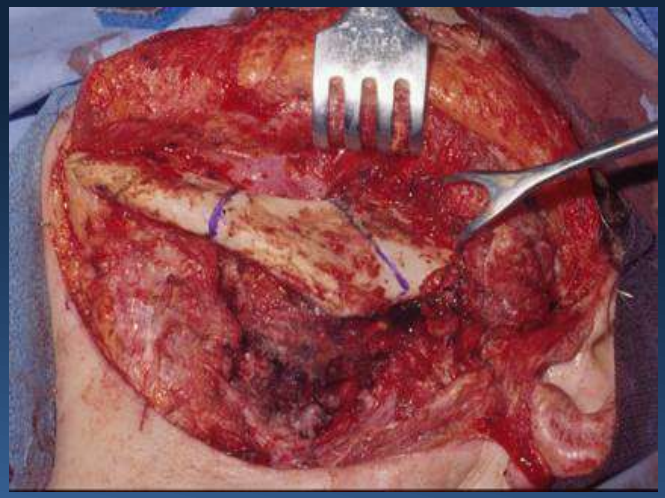
Mandibulectomy

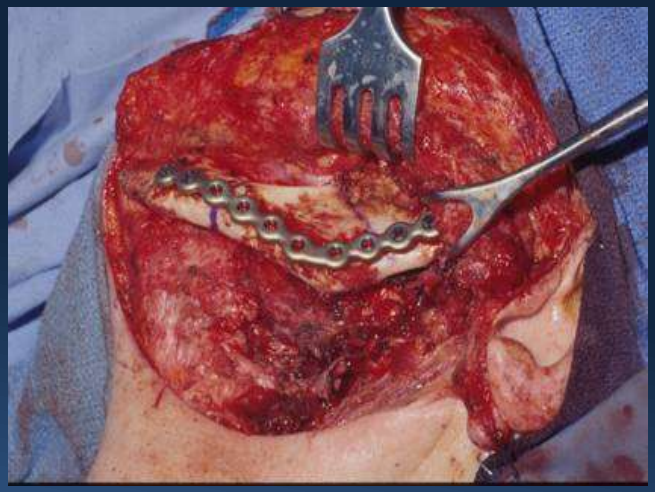


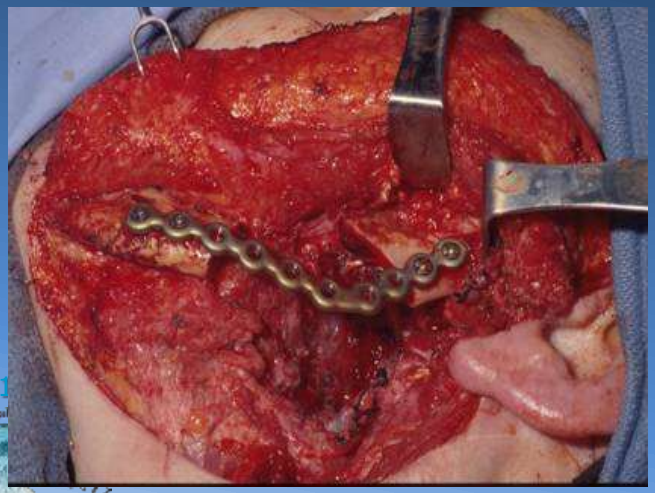


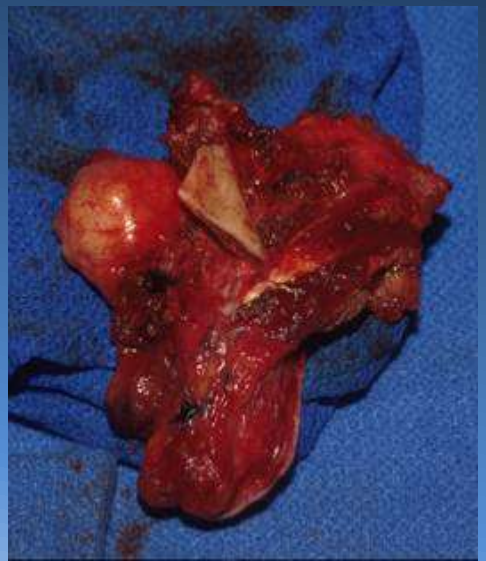
Adenoid Cystic Carcinoma

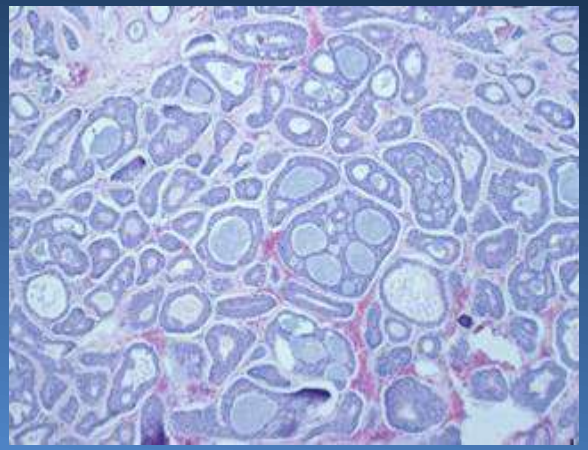
Mandibulectomy





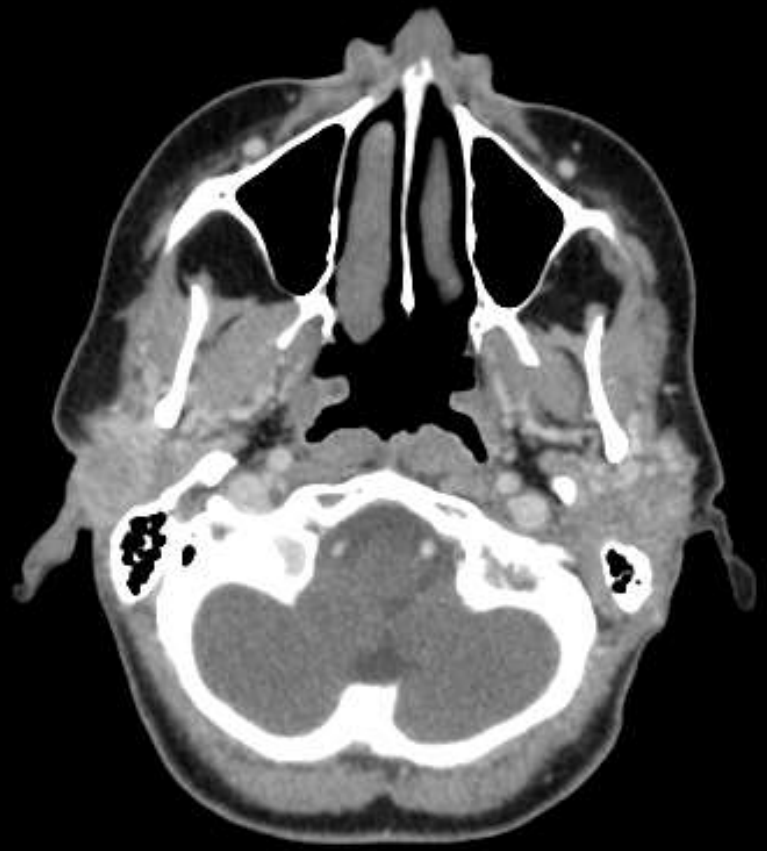






Adenoid Cystic Carcinoma

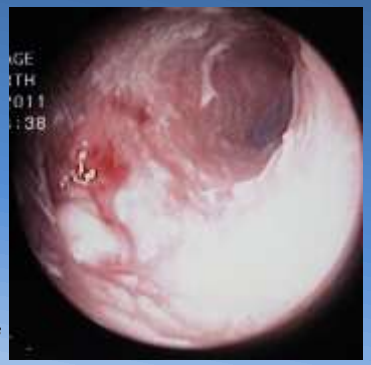
Temporal Bone

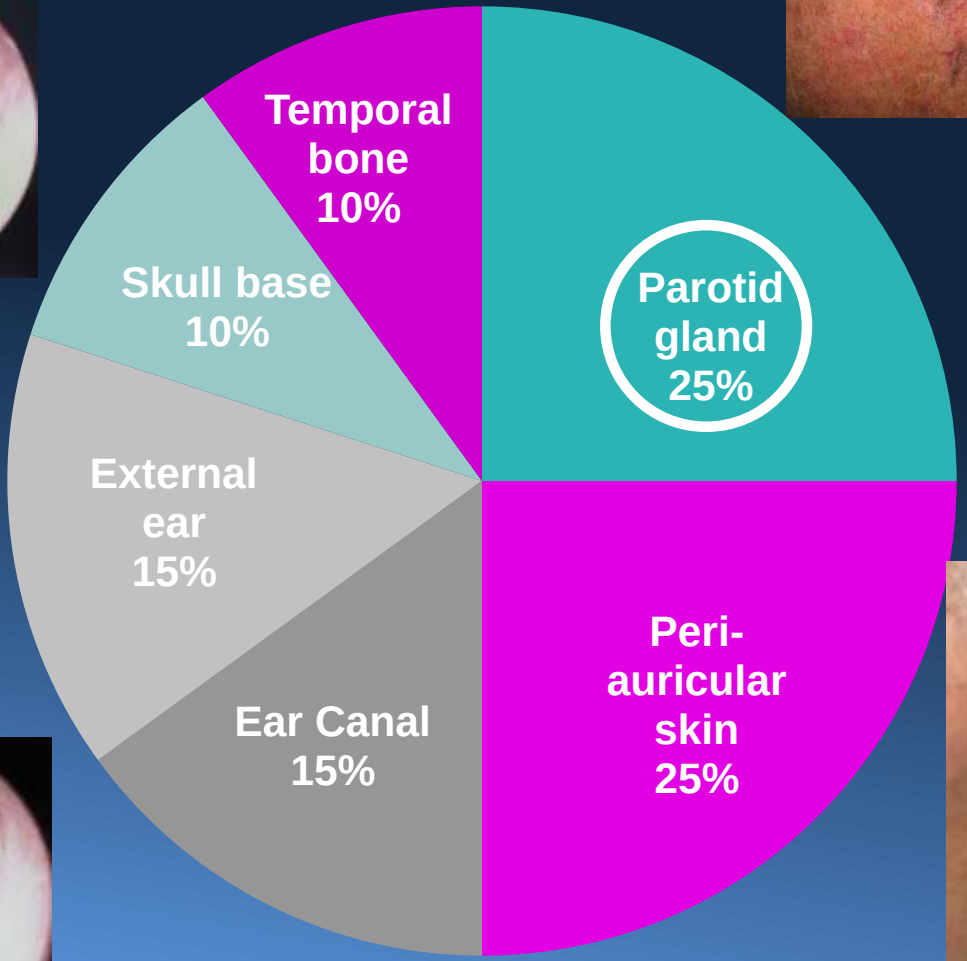


Temporal Bone Resection

- 263 patients with cancer involving ear canal or temporal bone
- 1999-2011
- Ages 7 to 91 years
  - Average = 60 years
- 75% men

Location of Primary

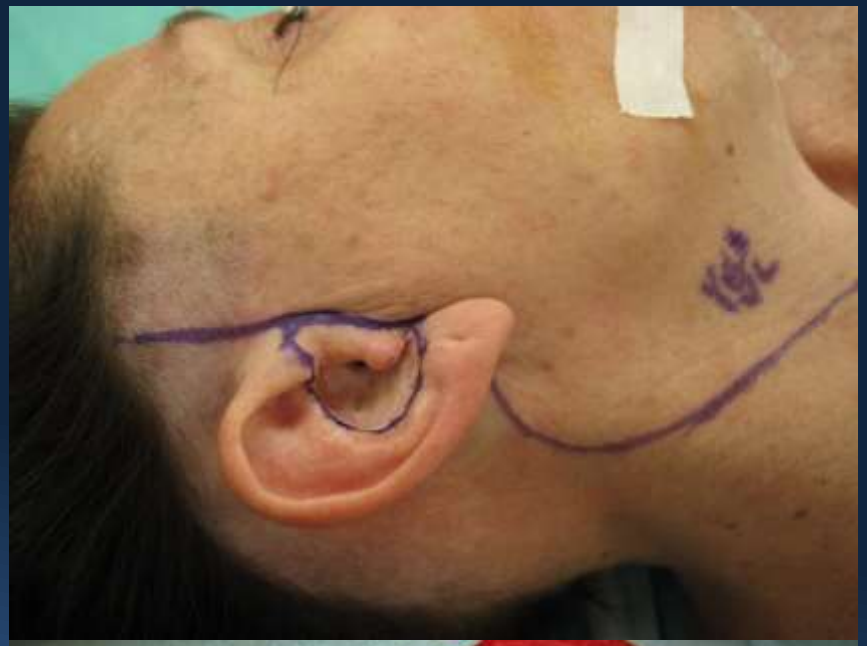


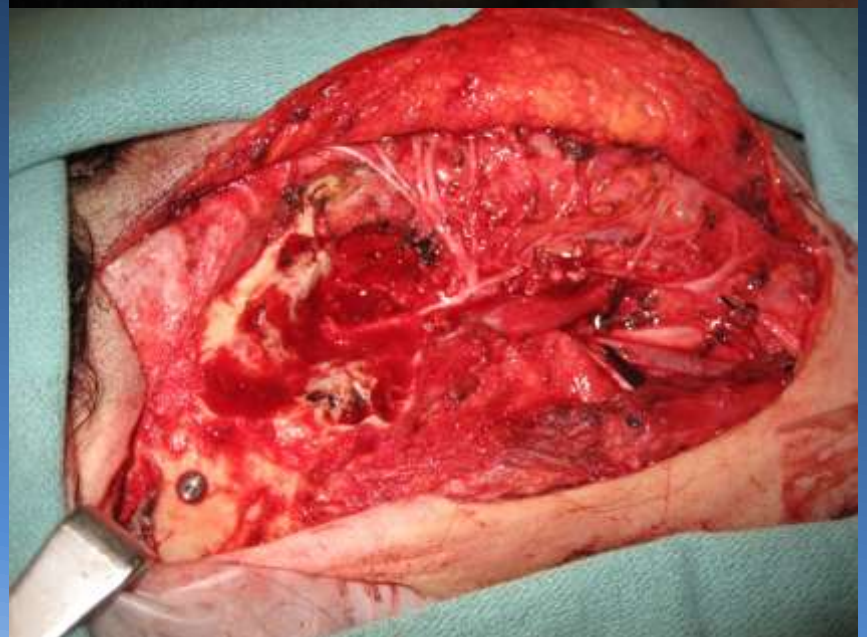


2017 International Federation of Head and Neck Oncologic Societies

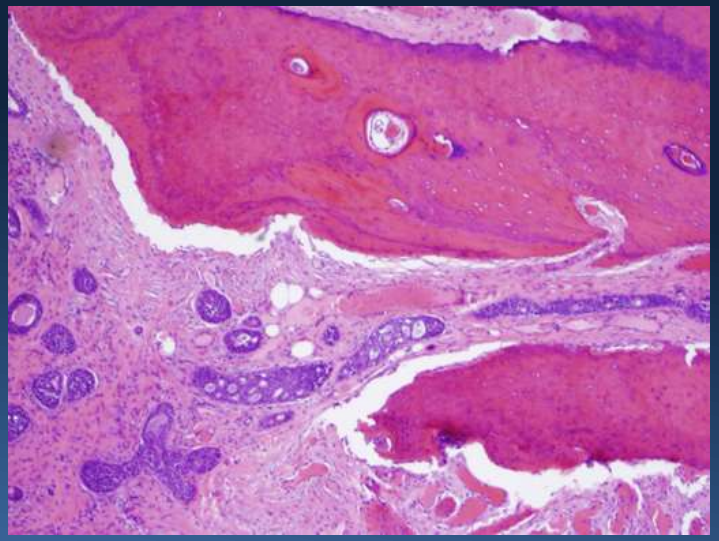
Temporal Bone Invasion

- Lateral temporal bone resection
- Parotidectomy
- Neck dissection
- Free flap
- Vistafix implant

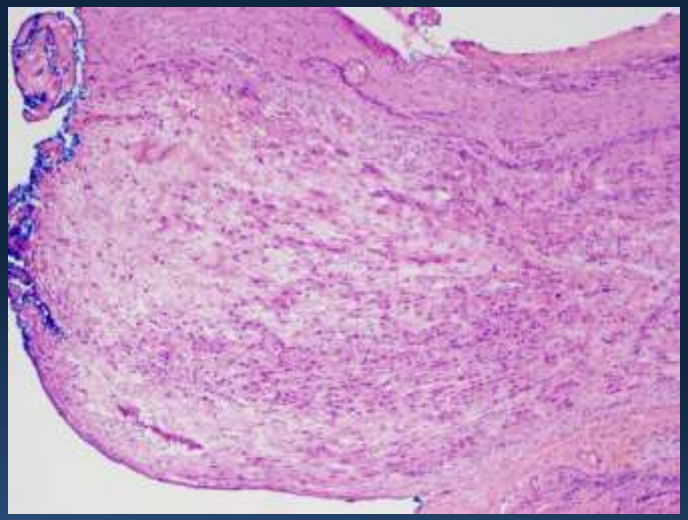




Pathology



Adenoid cystic ca invading bone.



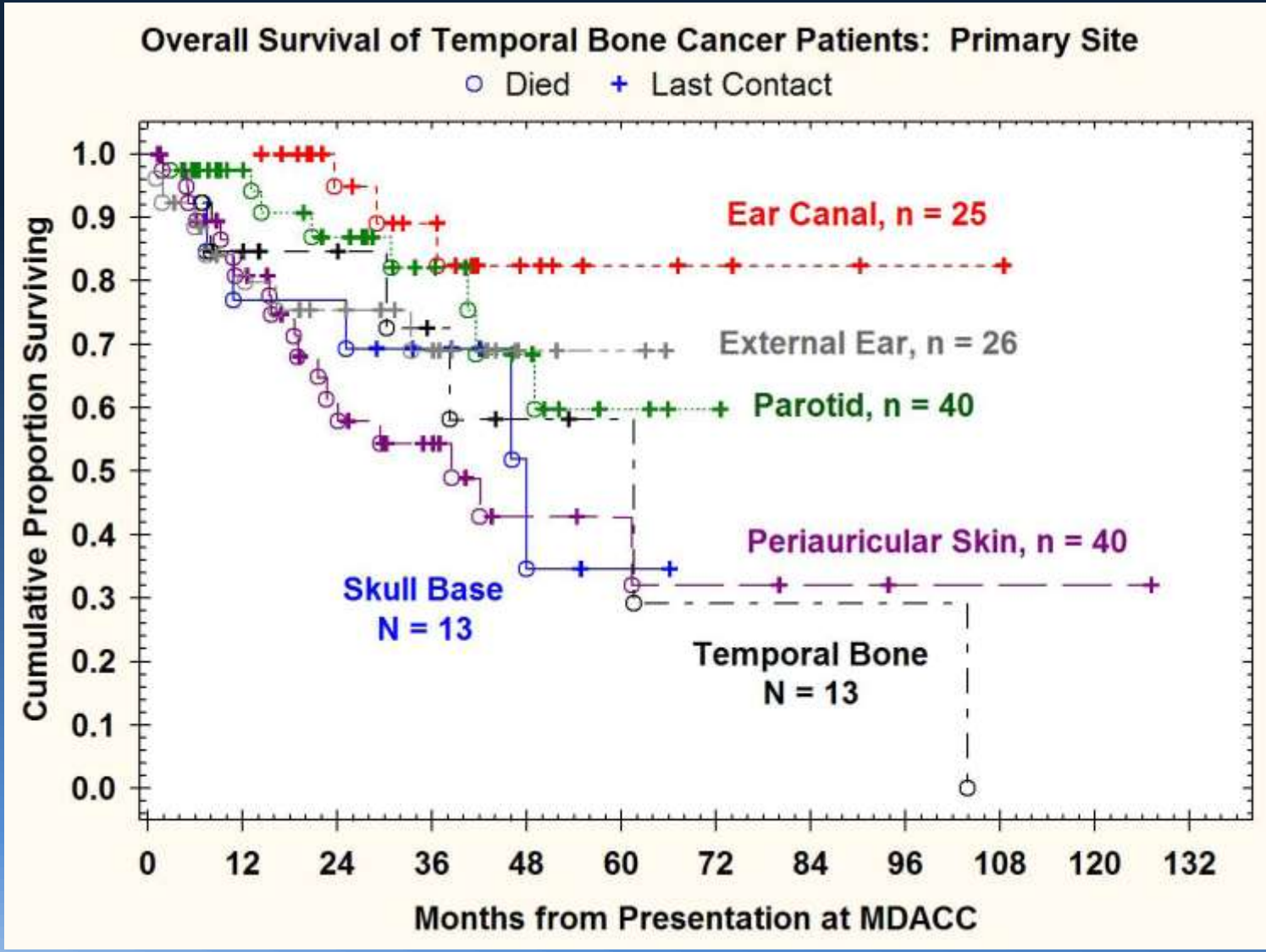
PNI in facial nerve

Second Stage Surgery

Performed 15 months after first stage surgery.
07/2012

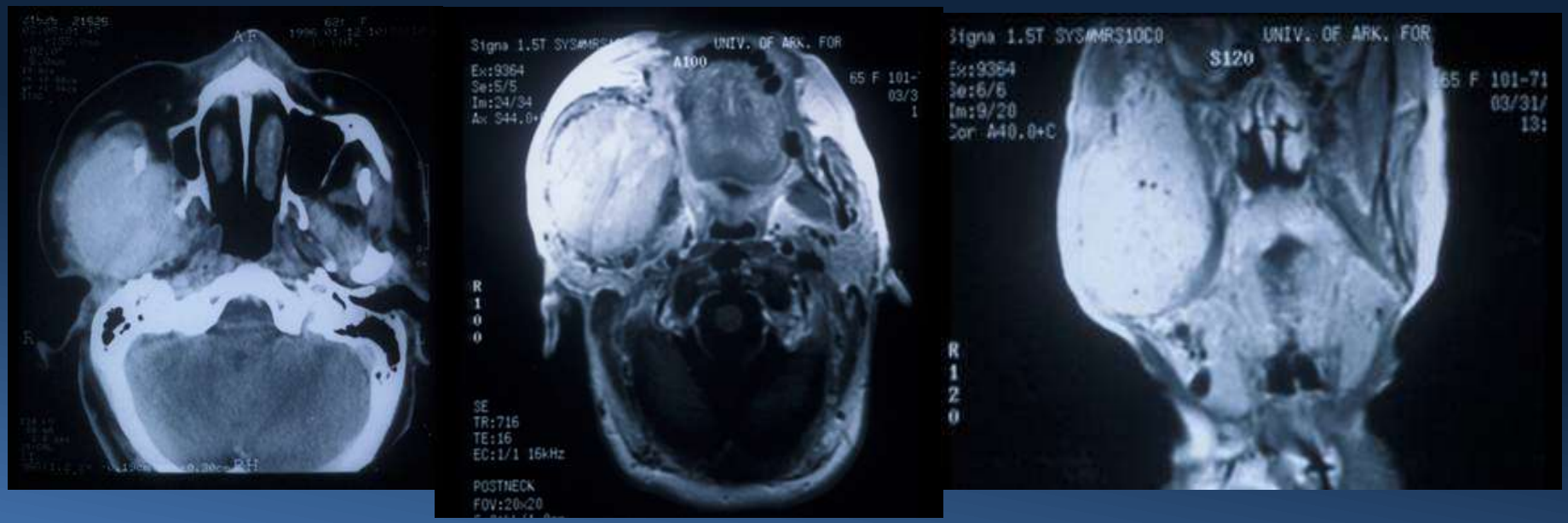
Auricular prosthesis in place
09/2012

Overall Survival by Primary Location

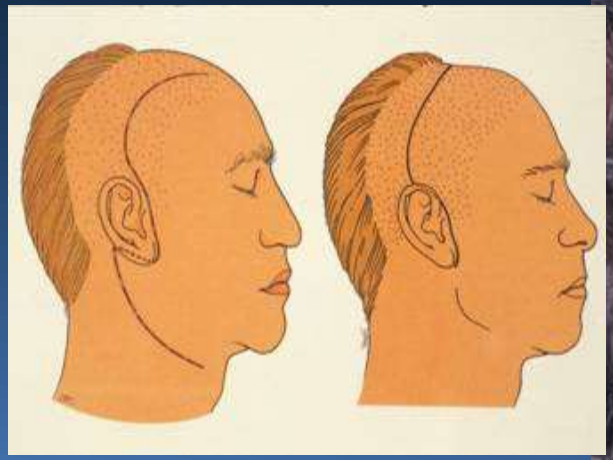


2017

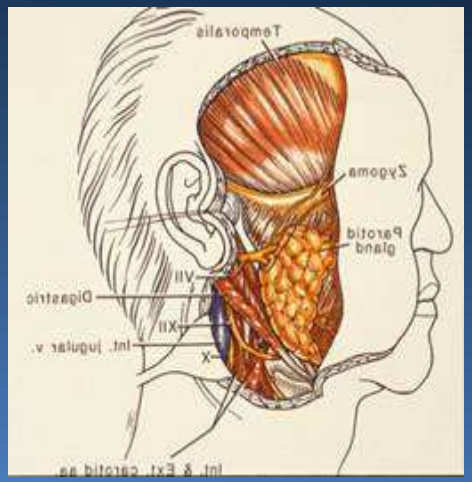
Infratemporal Fossa

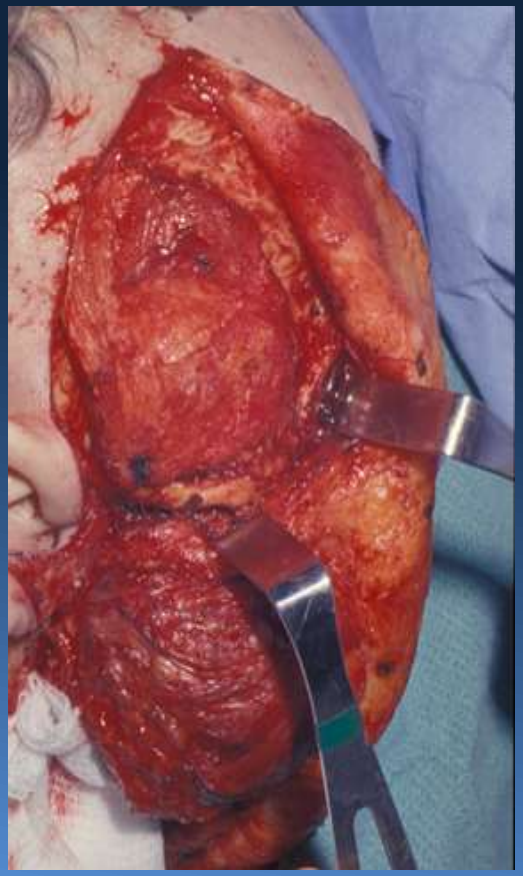


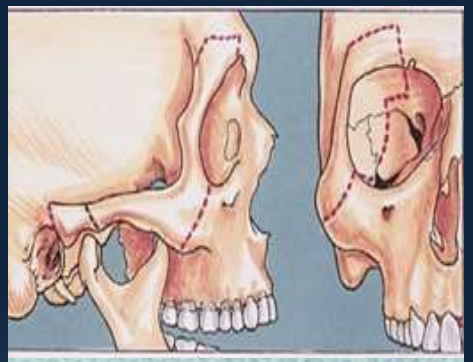
Infratemporal Approach



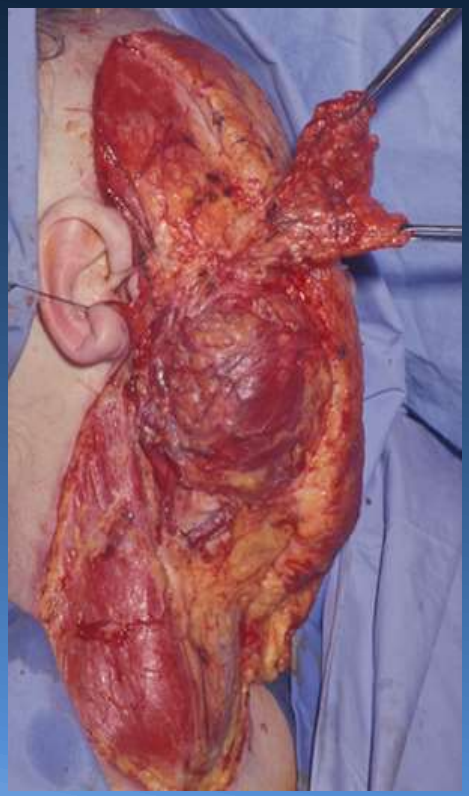
Zygomatic Osteotomy

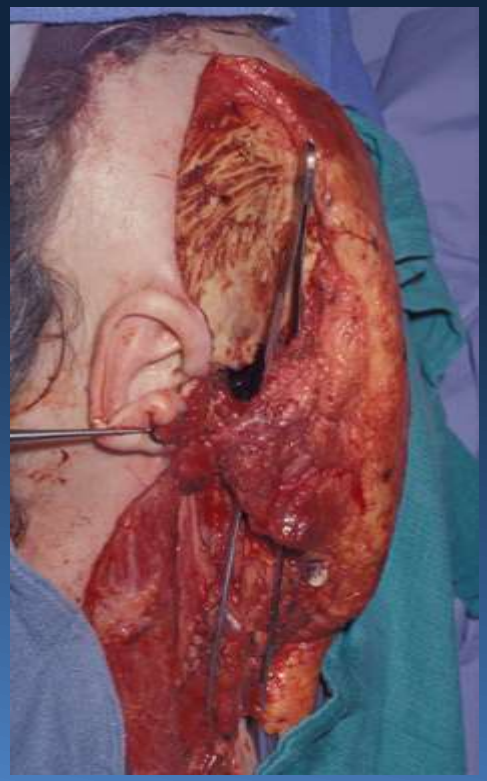


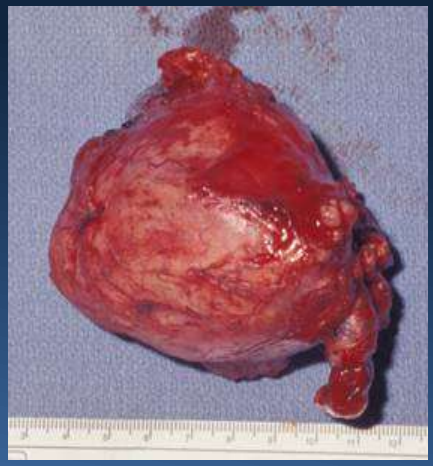




Infratemporal Approach

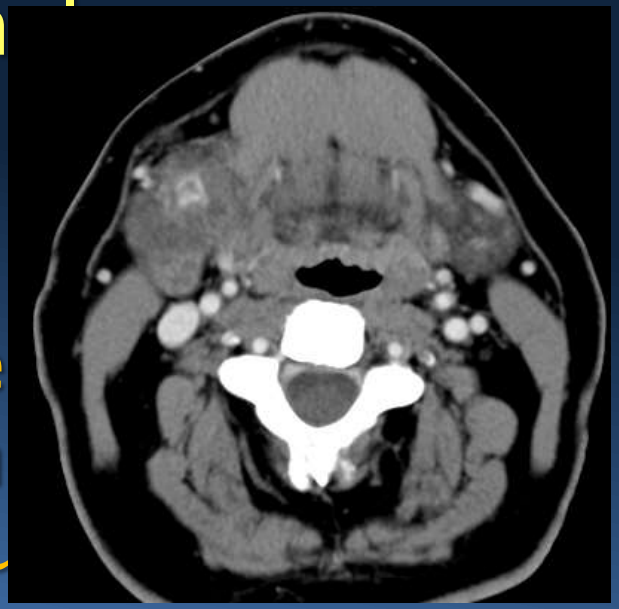






Submandibular Gland Resection

- Clearance of the submandibular triangle
- Special attention to region
  - Marginal mandibular
  - Lingual
  - Hypoglossal
  - Nerve to mylo-hyoid muscle
- Extensions beyond the gla
  - Skin and subcutaneous tissu
  - Floor of mouth
  - Mandible



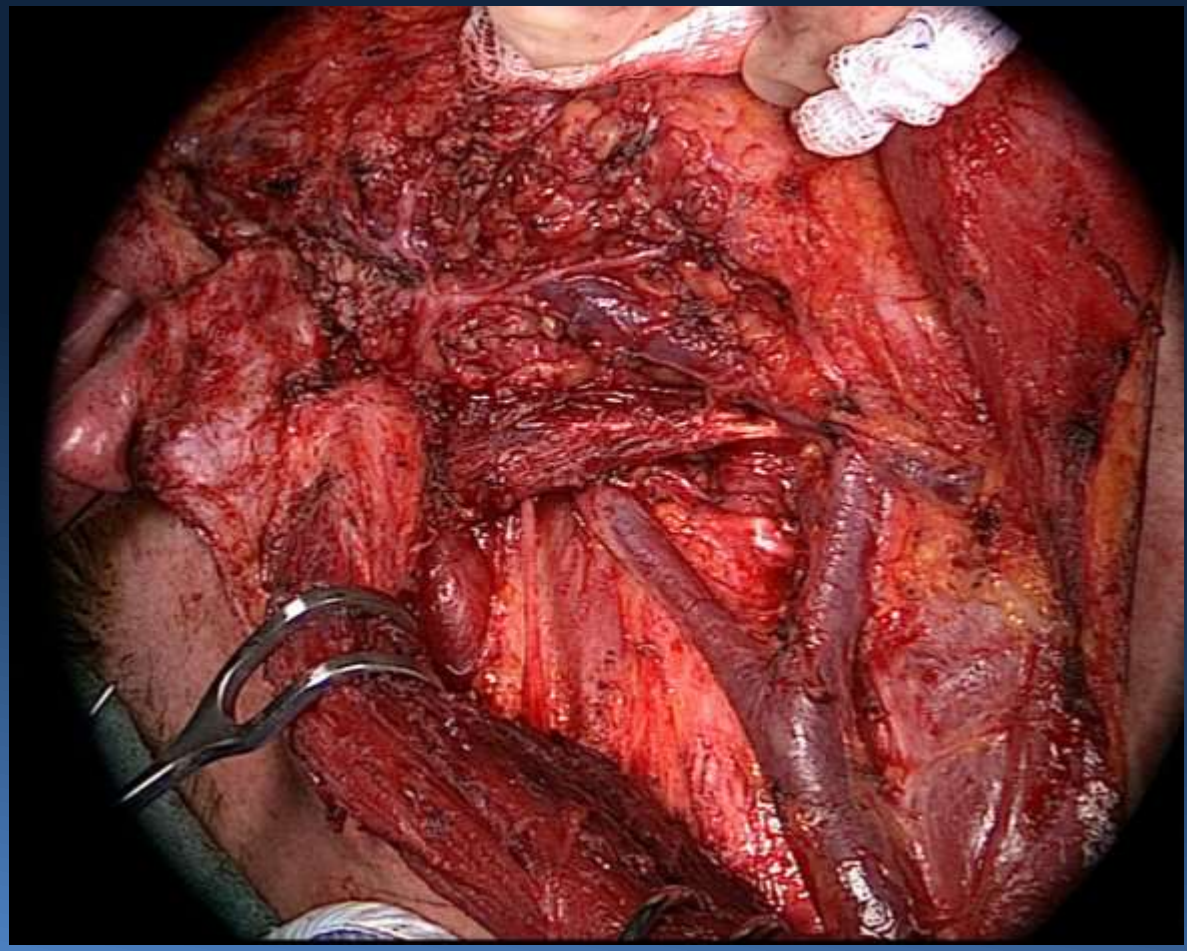
Lymph Node Metastasis

- Metastatic cervical adenopathy is uncommon.
- SEER database review : 16% incidence

Int J Radiation Oncology Biol Phys Vol. 76(1), 2010

Surgical Management of the Neck

- cN+, a neck dissection is performed in conjunction with resection of the primary cancer.
- However, controversy still exists on the surgical management of the (N0) neck
- The indications and type of elective neck dissection are not well defined in the literature.
- Collectively, the risk of occult metastasis in ACC of the major Salivary Glands is around 12%



Incidence of cervical lymph node metastasis and its association with outcomes in patients with adenoid cystic carcinoma. An International Collaborative Study

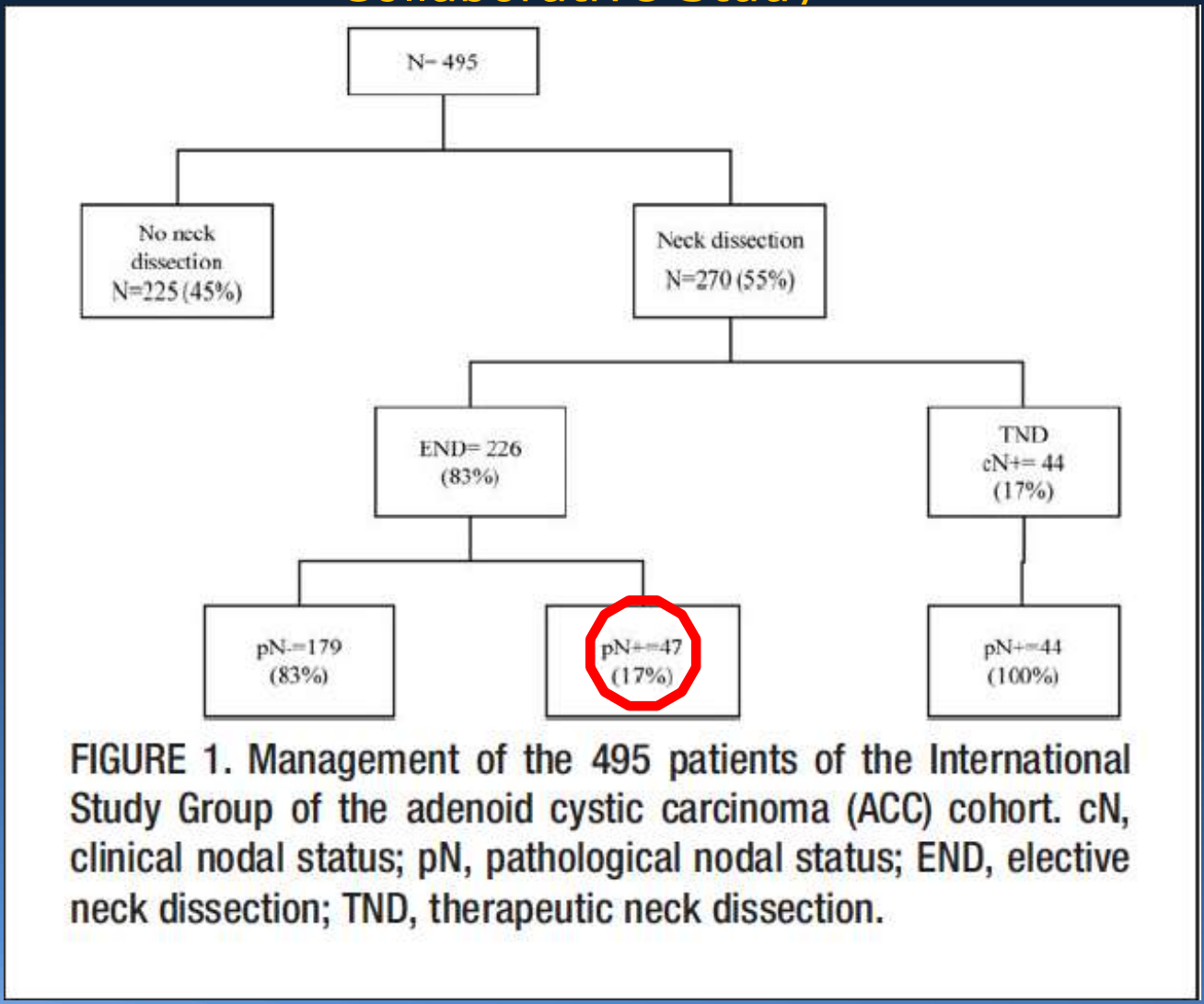


FIGURE 1. Management of the 495 patients of the International Study Group of the adenoid cystic carcinoma (ACC) cohort. cN, clinical nodal status; pN, pathological nodal status; END, elective neck dissection; TND, therapeutic neck dissection.

Moran Amit et al Head & Neck 2014

Incidence of cervical lymph node metastasis and its association with outcomes in patients with adenoid cystic carcinoma. An International Collaborative Study

Overall rate of LN metastasis 29%

TABLE 2. Incidence of neck metastases according to the primary site.

Variables	Major salivary glands ($n = 95$)	Oral cavity ($n = 148$)	Sinonasal ($n = 25$)	Larynx ($n = 2$)	p value
Ipsilateral					.02
I–III	10 (10%)	47 (31%)	4 (16%)		
IV–V	8 (8.5%)	8 (5%)	1 (4%)	1 (50%)	
Contralateral					
I–III		2 (1%)			

17% 12% 22% 16%

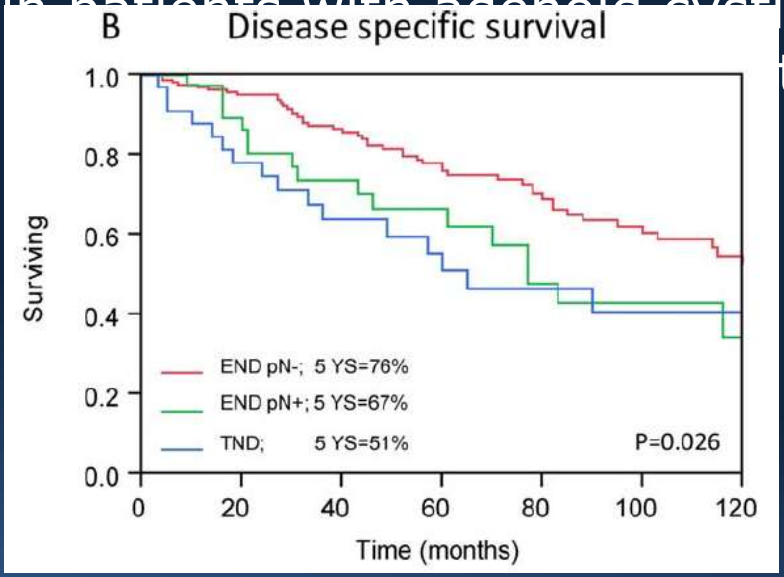
Overall rate of occult metastasis

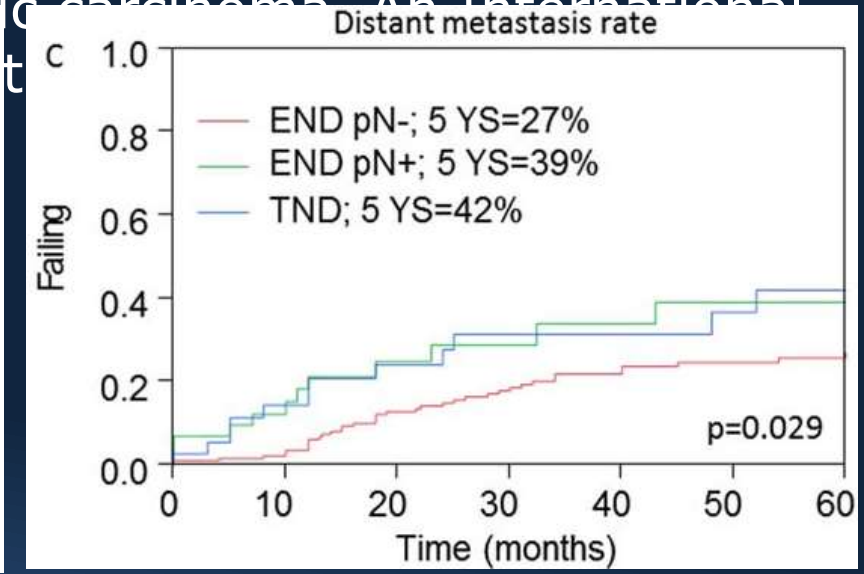
2017

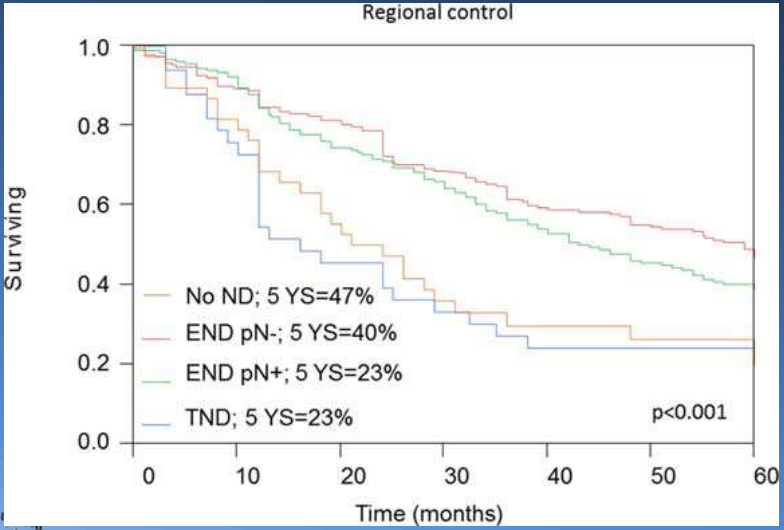
Moran Amit et al Head & Neck April 2014

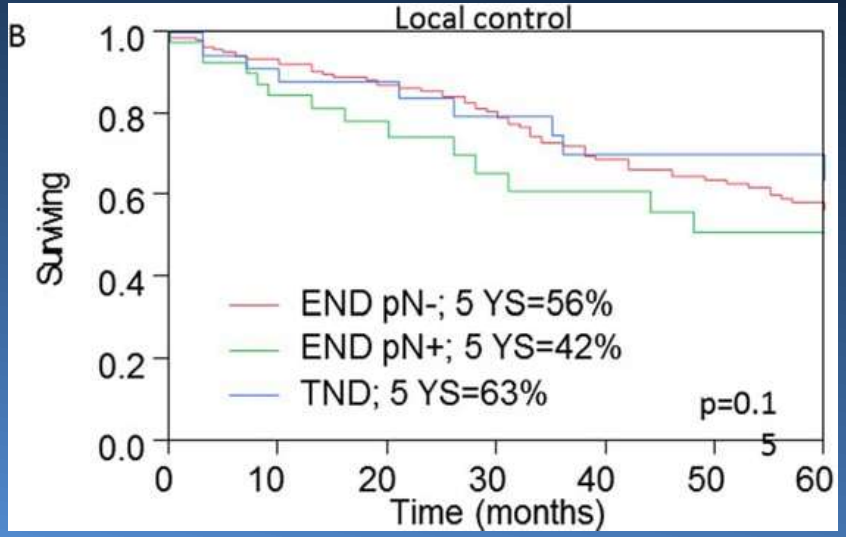
Incidence of cervical lymph node metastasis and its association with outcomes

in patients with adenoid cystic carcinoma. An International t









2017

Moran Amit et al Head & Neck April 2014

Risk of Nodal Metastasis

- 145 patients with cancer of the parotid gland, the following variables were significantly associated with a risk of lymph node metastasis
  - histological type, T stage, desmoplasia, facial palsy, perineural invasion, extraparotid tumor extension, and necrosis.
- By multivariate analysis, histological type and T stage had the highest correlation with lymph node metastasis.

- Regis De Brito Santos I, et al: Multivariate analysis of risk factors for neck metastases in surgically treated parotid carcinomas. Archives of Otolaryngol HNS 127:56-60, 2001

Elective Neck Dissection

- Indications
  - Advanced stage (T3-T4)
  - high-grade tumors
    - undifferentiated carcinoma, high-grade MEC and ACC, SCC, adenocarcinoma, and salivary duct carcinoma
- A selective (supra-omohyoid) neck dissection may be used as a staging procedure in such cases.
- Suspicious nodes should be sent for frozen-section diagnosis, and if positive for metastatic carcinoma, then a comprehensive neck dissection is performed.

  - Medina JE: Neck dissection in the treatment of cancer of major salivary glands. Otolaryngologic Clinics of North America 31:815-22, 1998

Is there a role for surgery in patients with M1 disease?

Case Presentation

77-year-old woman with a recent diagnosis of left parotid gland adenoid cystic carcinoma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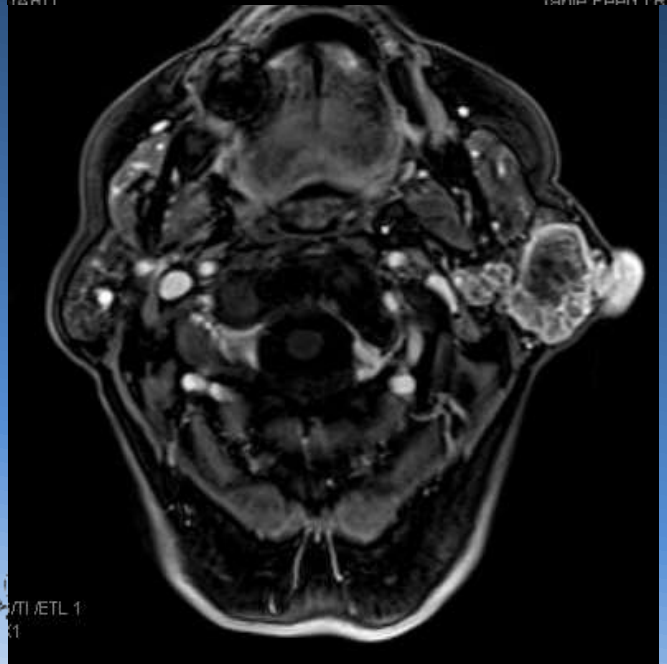
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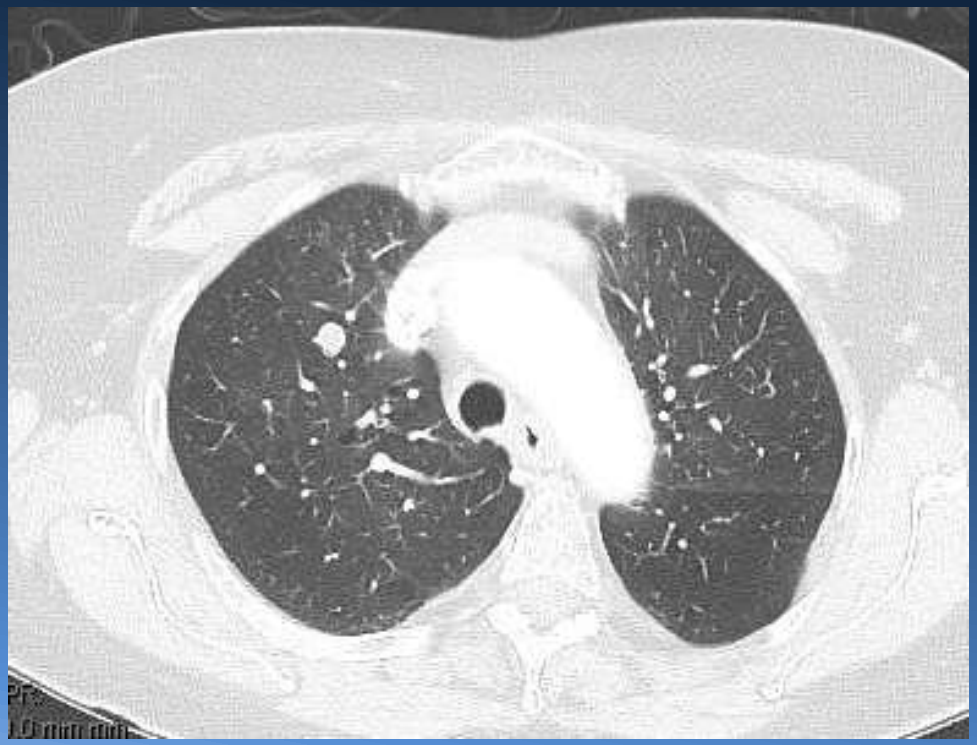
CT Chest

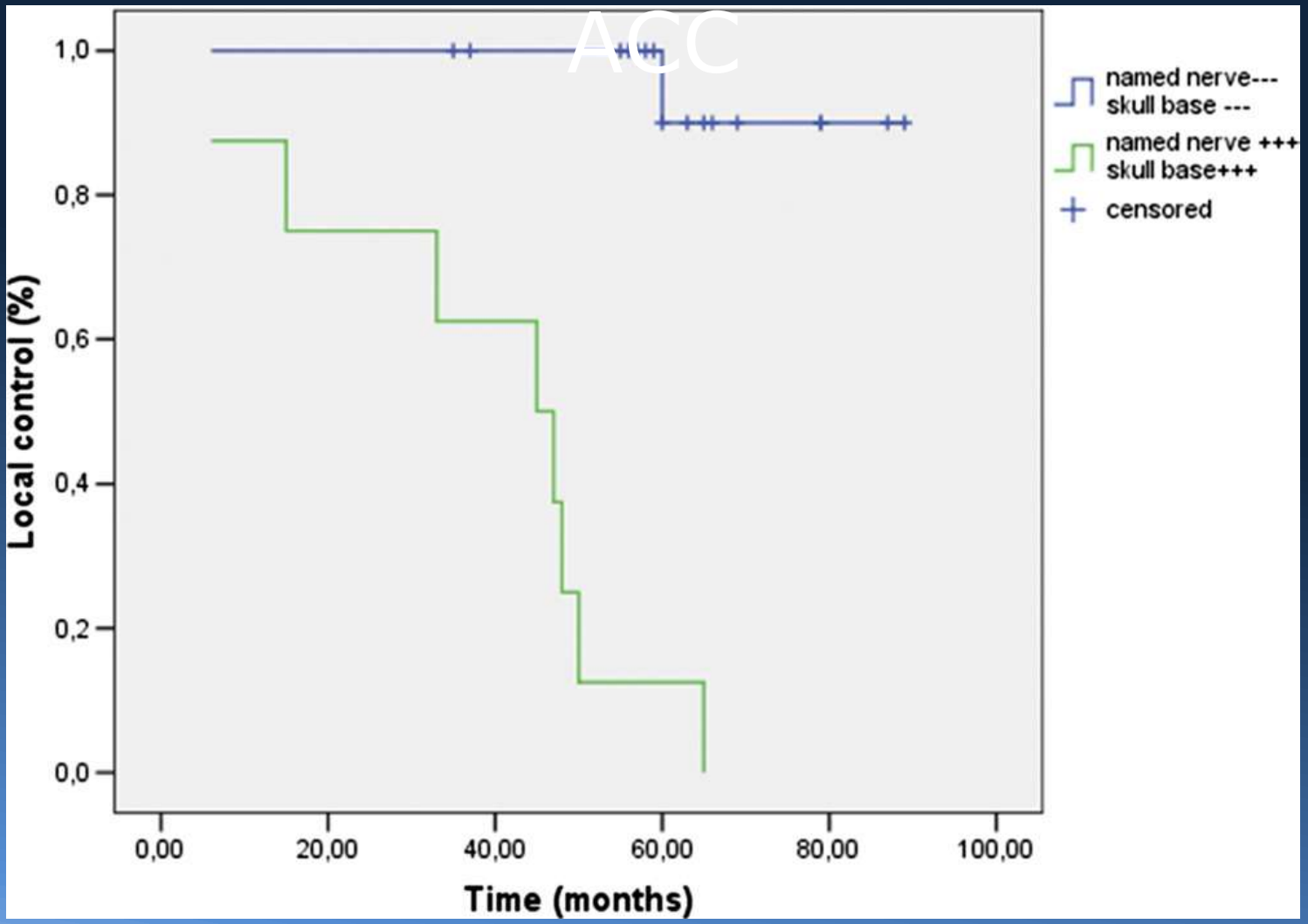
- There are numerous bilateral pulmonary nodules compatible with metastasis, the largest one in the right upper lobe, measures 11 mm in long axis.
- Surgery?



Factors Influencing Survival

- Stage
- Histology
- Site
- Facial nerve paralysis
- Perineural Spread
- Positive margins
- Bone/SKB invasion
- Skin involvement
- Recurrent disease
- Nodal metastasis
- Systemic metastasis
- Treatment modality

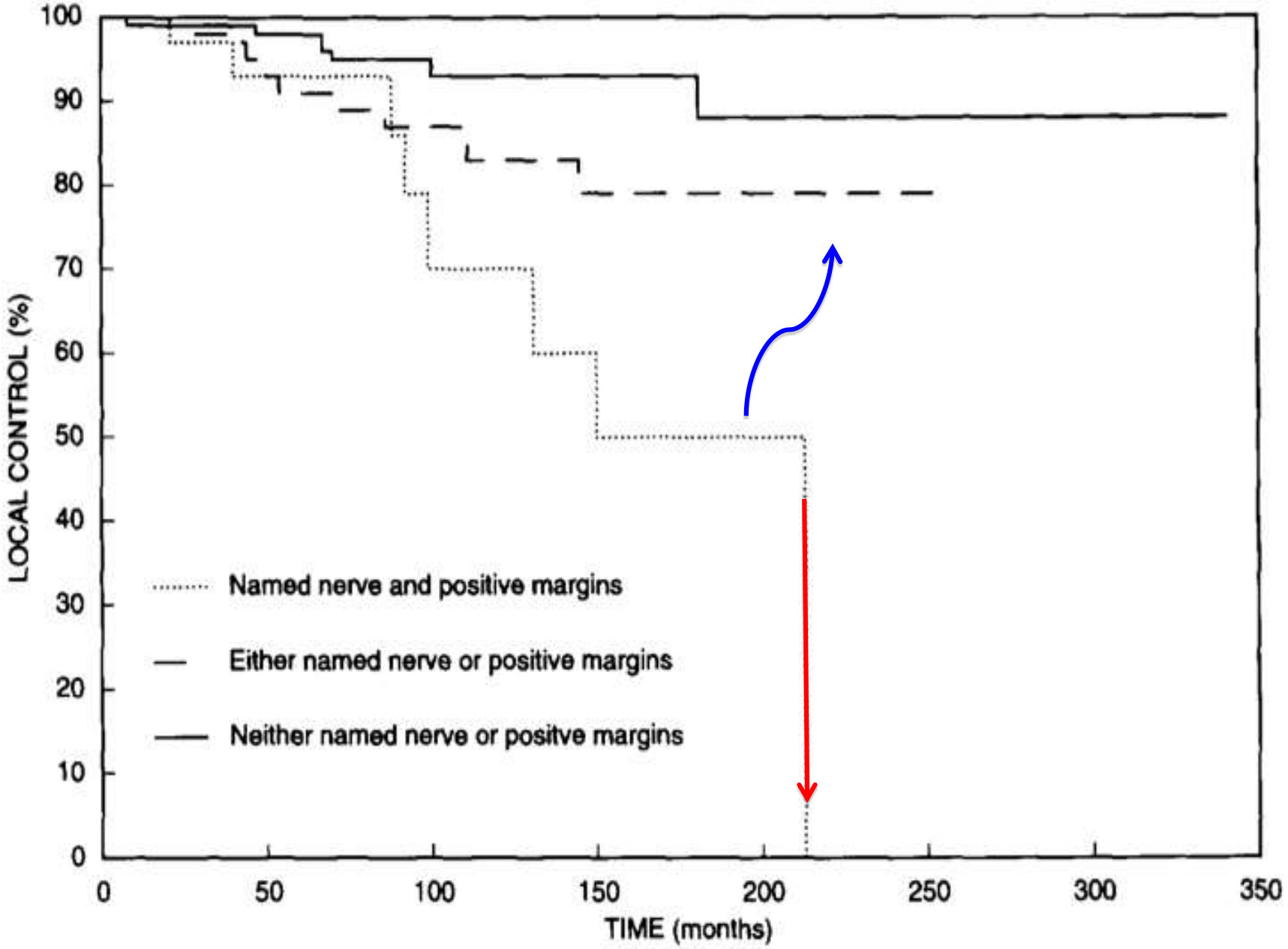
Major Nerve Involvement by



Oral Surg Oral Med Oral Pathol Oral Radiol 2012;113:214-221)

Extent of surgery in presence of major nerve PNI?

As much as feasible one should achieve GTR R0 0r R1



Garden. Int. J. Rad Oncol Biol Phys 32:619(1995

Surgery + XRT +Margins and PNI in ACC

- 198 Pts 1962-1991
- 83 Pts microscopically + margins
- 55 Pts close or uncertain margins
- 136 PNI- 55 PNI of Major nerve
- Median 60Gy(50-69Gy) Post-op XRT
- Median f/u 93months(5-341)
- 37% DM with 31% disease free at primary site

Garden. Int. J. Rad Oncol Biol Phys 32:619(1995)

Surgery + XRT +Margins and PNI in ACC

- **Local Recurrence Rate**
  - **Margins**
    - **Positive 18%**
    - **Close 9%**
    - **Negative 5%**
  - PNI
    - Major nerve 18%
    - Minor nerve 9%

Garden. Int. J. Rad Oncol Biol Phys 32:619(1995

Surgery + XRT +Margins and PNI in ACC

- Actuarial Local Control

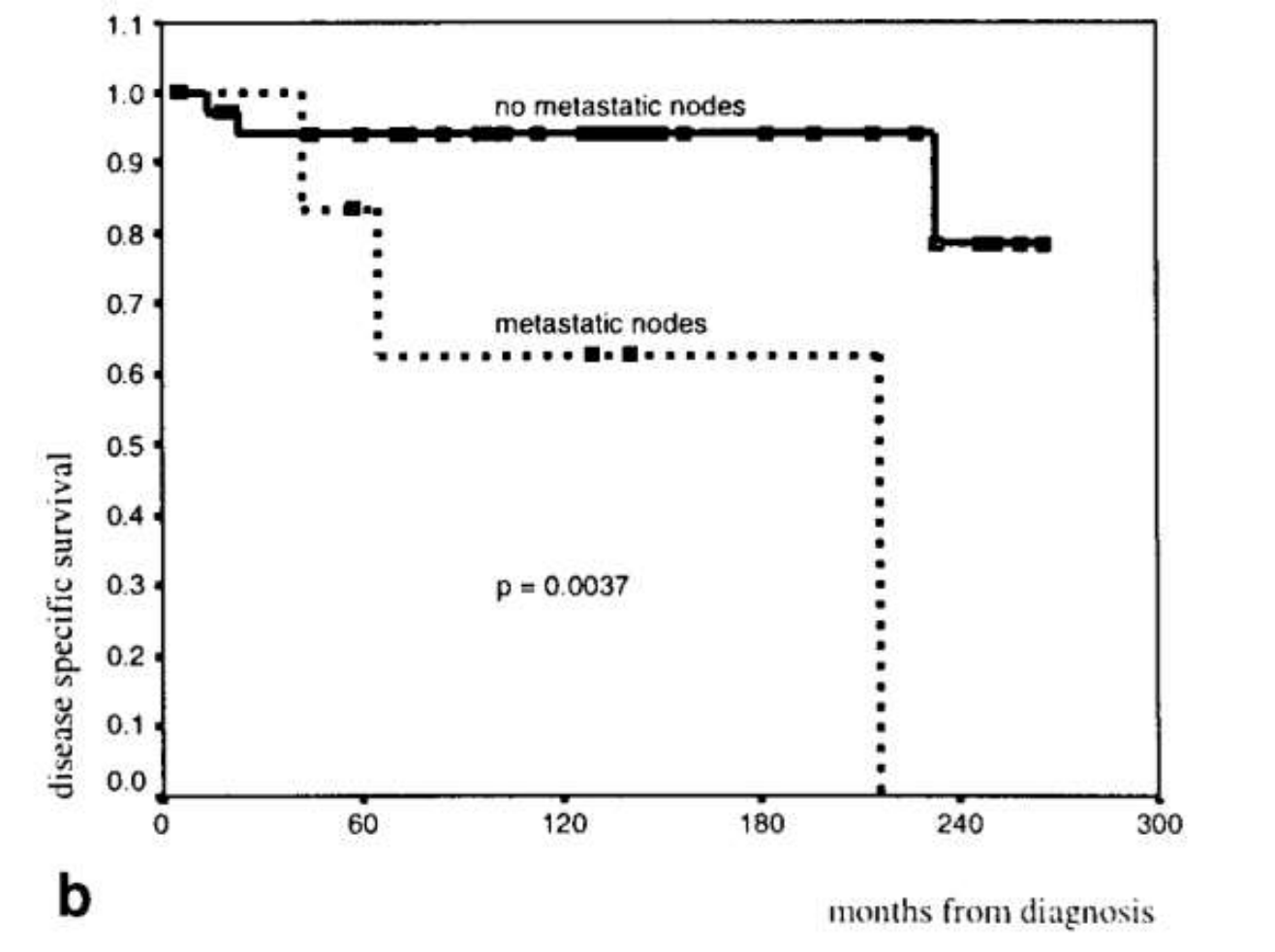
5yr	95%
10	86%
15	79%

- **Dose and Local control for + Margins**

<56 Gy	**40%**
>56Gy	**88%**

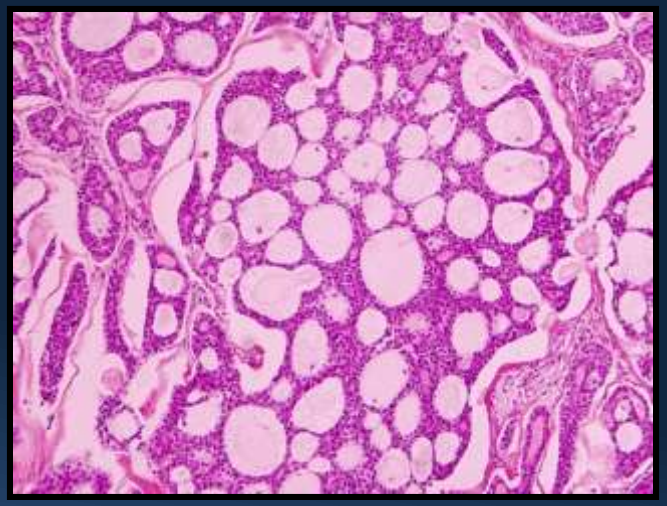
Garden. Int. J. Rad Oncol Biol Phys 32:619(1995

Effect of Nodal Metastasis on Outcome

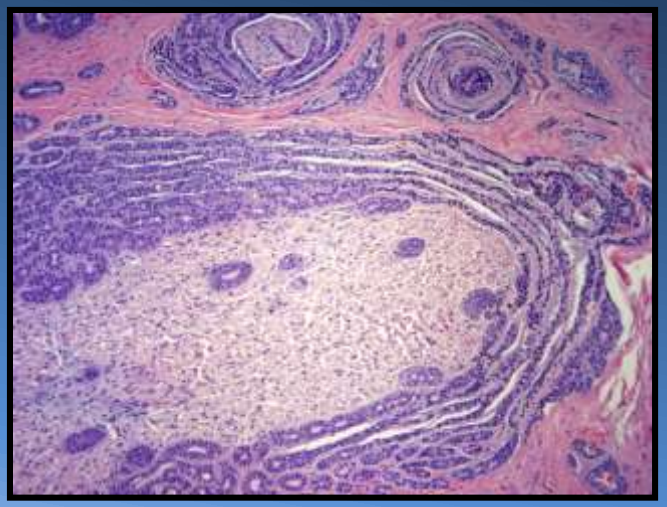


Cancer 2000;89:1195-204.

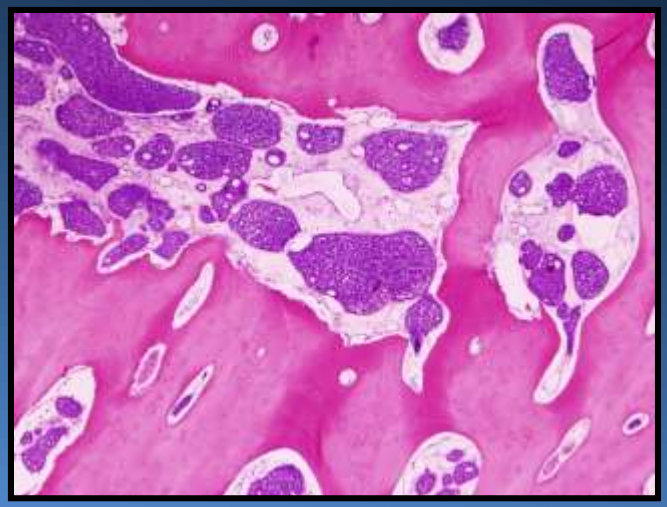
Adenoid Cystic Carcinoma



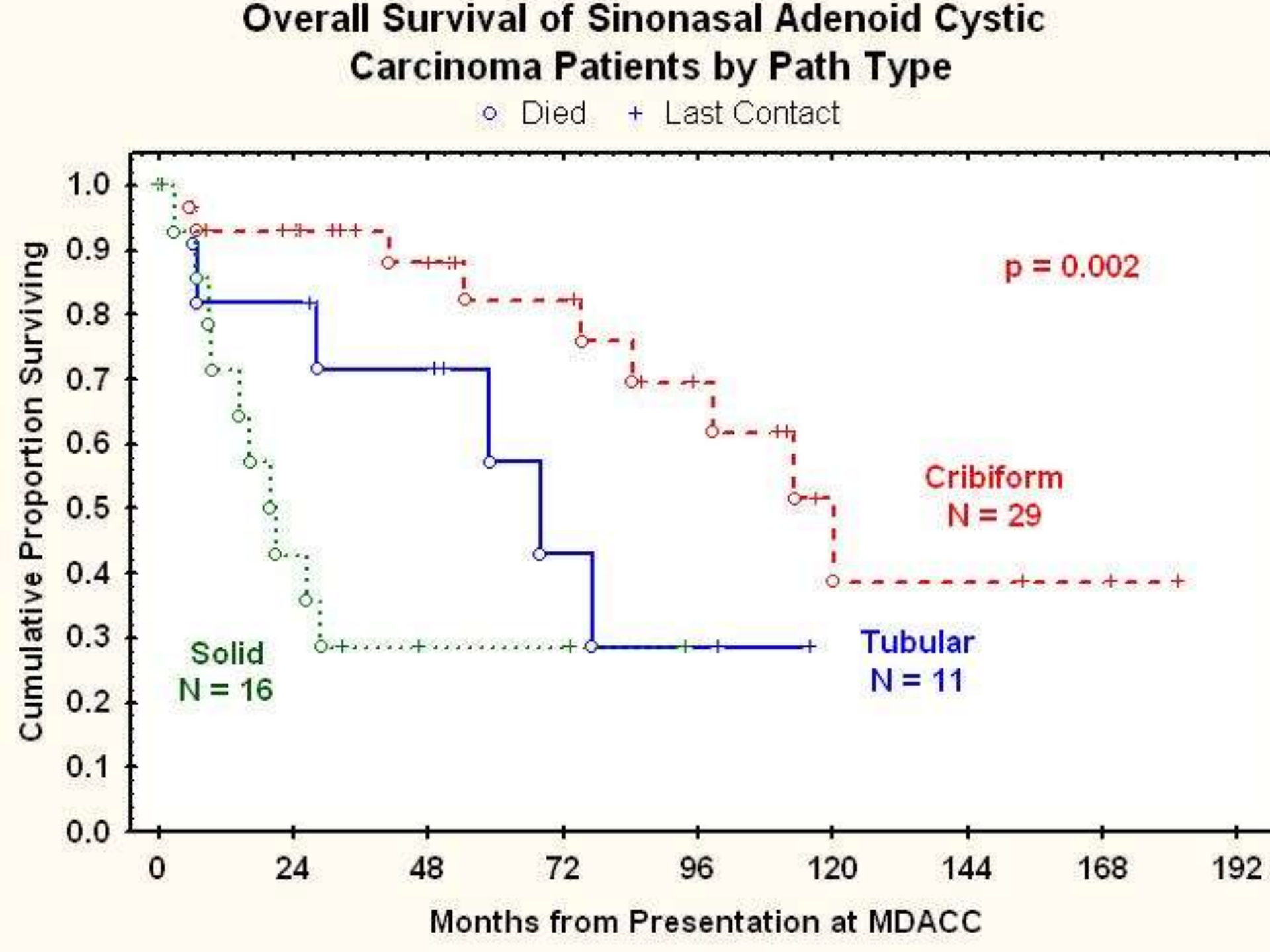
Cribiform type



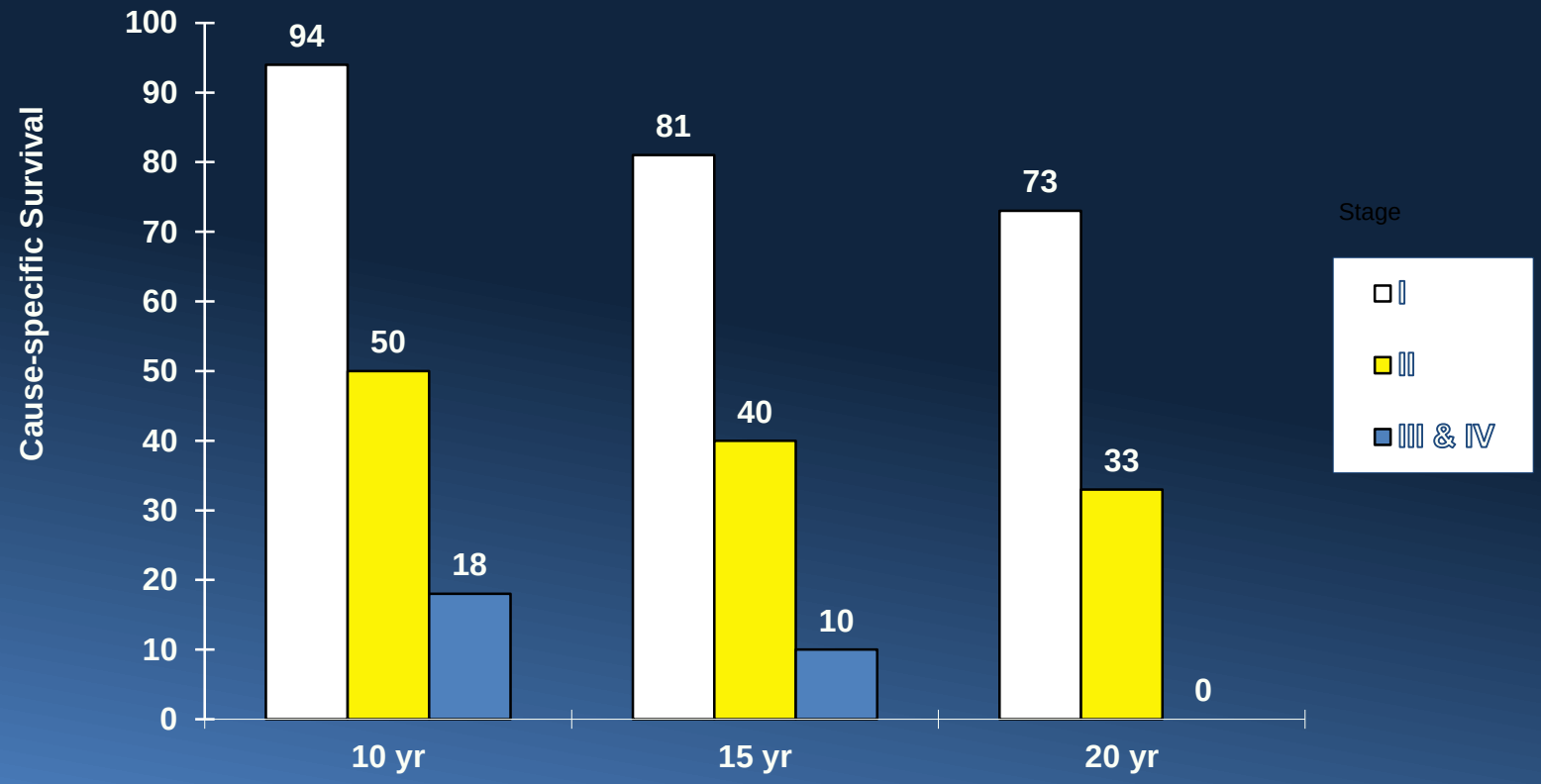
Perinerual invasion



Bone invasion – solid type

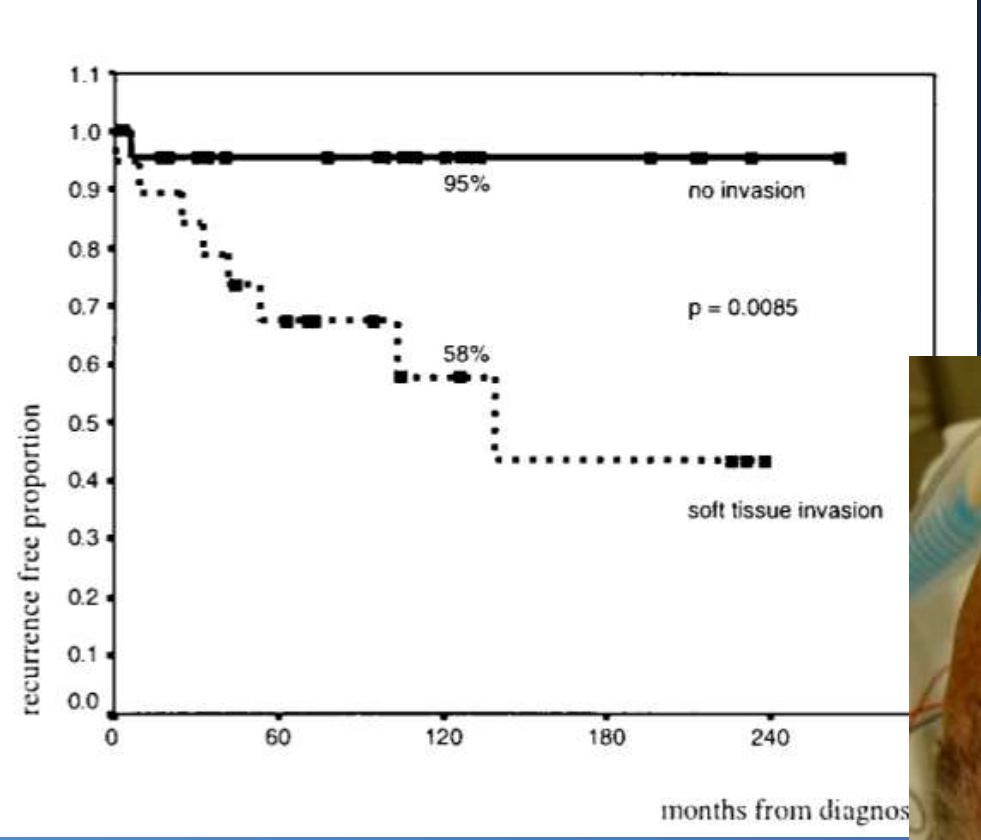

Overall Survival of Sinonasal Adenoid Cystic Carcinoma Patients by Path Type
Died
Last Contact
Cumulative Proportion Surviving
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
p = 0.002
Cribiform
N = 29
Tubular
N = 11
Solid
N = 16
0
24
48
72
96
120
144
168
192
Months from Presentation at MDACC

Stage



Spiro RH, Huvos AG: Stage means more than grade in adenoid cystic carcinoma. American Journal of Surgery 164:623-8, 1992

Extraparenchymal Extension



Extraparenchymal Spread

Cancer 2000;89:1195-204

2017

Salivary Gland Malignancy

Independent Predictors of LRR

Variable	Hazard Ratio	P-value
LN Metastasis	4.80	0.001
High Tumor Grade	4.18	0.003
Positive Margins	2.61	0.03
T3-4 Disease	2.05	0.04

Adapted from *Int J Radiation Oncology Biol Phys, Vol 67(4), pp. 982-987, 2007.*

Indications for Postop XRT

- Indications
  - high-grade tumors,
  - large primary lesions (T3-4)
  - perineural invasion
  - bone invasion
  - cervical lymph node metastasis
  - positive margins.
- Although a clear-cut survival advantage has not been proven, the addition of postoperative XRT improves loco-regional control for patients with such adverse prognostic parameters.
  - Tullio A, et al: Treatment of carcinoma of the parotid gland: the results of a multicenter study. Journal of Oral & Maxillofacial Surgery 59:263-70, 2001

RTOG 1008: A Randomized Phase II Study of Adjuvant Concurrent Radiation and Chemotherapy Versus Radiation Alone in Resected High-Risk Malignant Salivary Gland Tumors

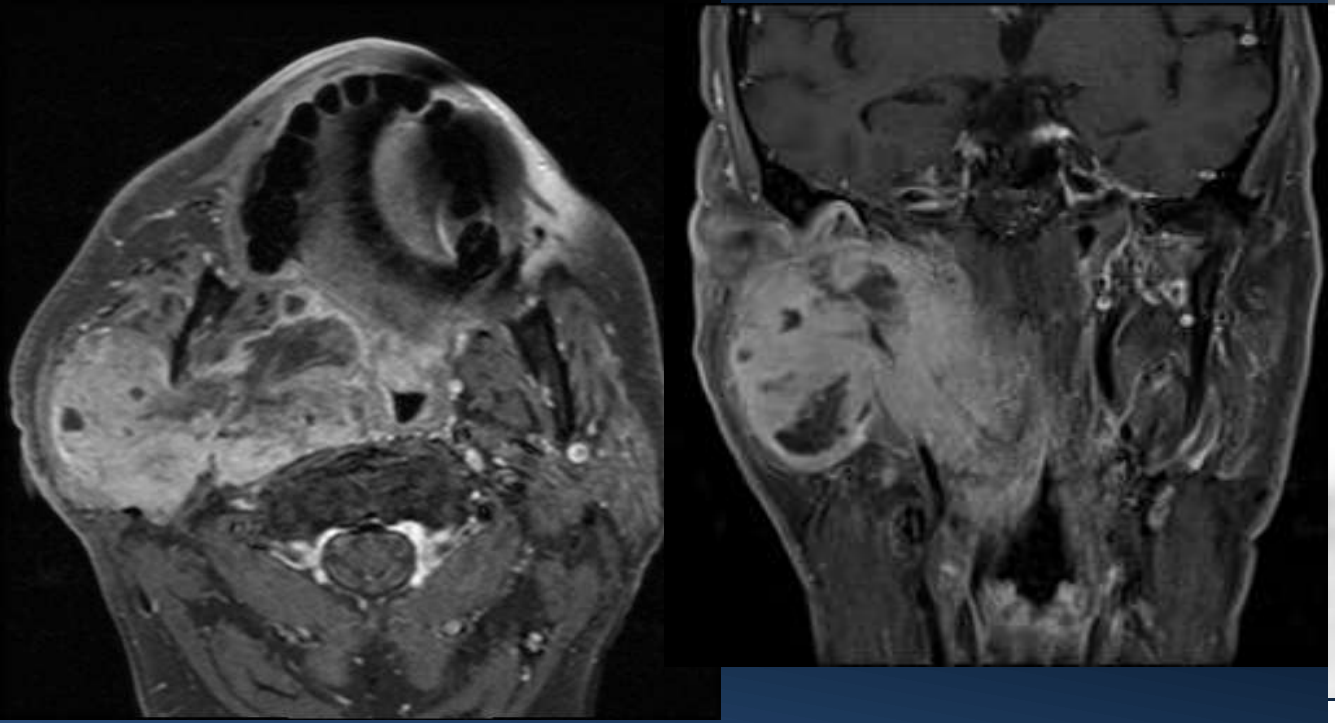
- Intermediate/High grade adenocarcinoma or MEC
- High Grade acinic cell carcinoma or ACC (>30% Solid)
- Salivary Gland Carcinoma

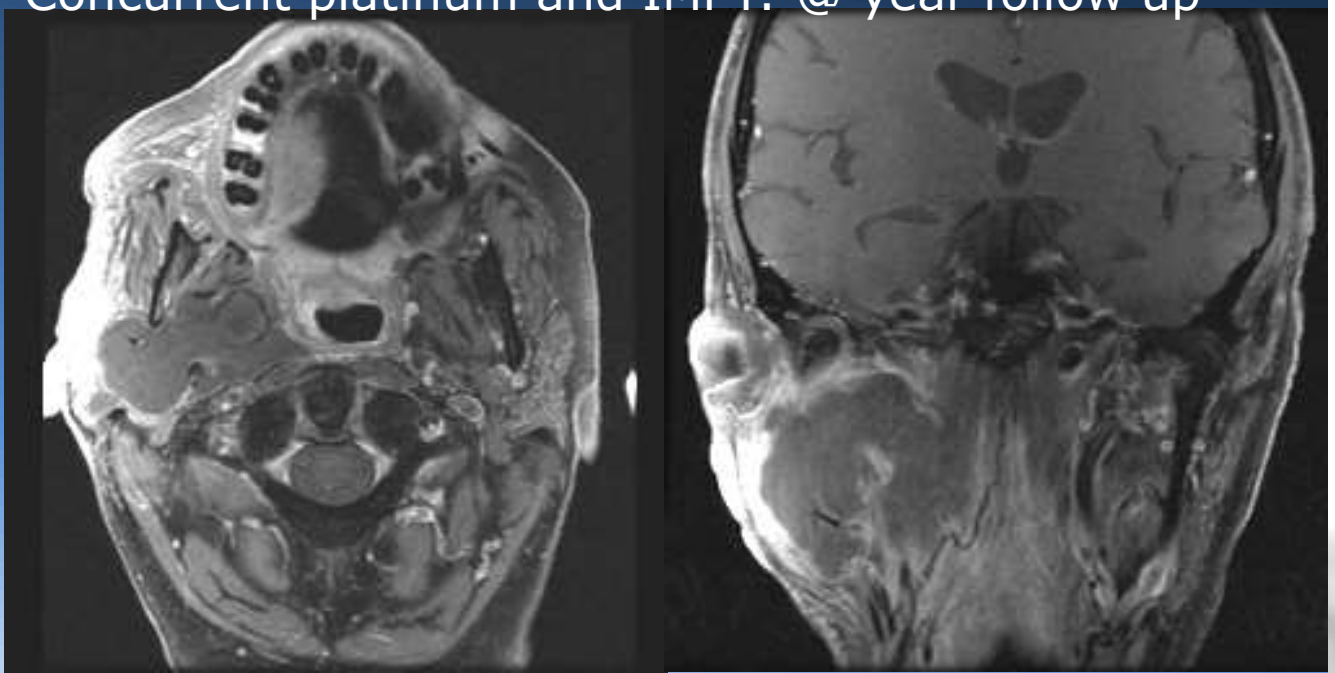
  - T3-4, or N1-3
  - T1-2 N0 patients with positive or close (≤1mm) microscopic margins
  - M0

Radiation: 60-66 Gy in 2 Gy daily fractions

Radiation: 60-66 Gy in 2 Gy daily fractions
+
Cisplatin: 40 mg/m2 weekly during radiation for 7 doses

Unresectable Disease?






Concurrent platinum and IMPT: @ year follow up

Thank you

2017