Head & Neck Tumours
Part I

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Content

- **Neck Masses**
- **Thyroid Gland**

Evaluation and Management of the Patient with a Neck Mass

- **Introduction**
- **Diagnostic Steps**
- **DDX**

Introduction

- **Common clinical finding**
- **All age groups**
- **Very complex differential diagnosis**
- **Systematic approach essential**

Diagnostic Steps

- **History**
  - Developmental time course
  - Associated symptoms (dysphagia, otalgia, voice)
  - Personal habits (tobacco, alcohol)
  - Previous irradiation or surgery
- **Physical Examination**
  - Complete head and neck exam (visualize & palpate)
  - Emphasis on location, mobility and consistency

Risk Factors

- Smoking
- Alcohol
- Wood dust exposure
- Sun exposure
- Previous burn or scar
- Family history
- Immune deficiency
- History of other cancer

Alarming sings

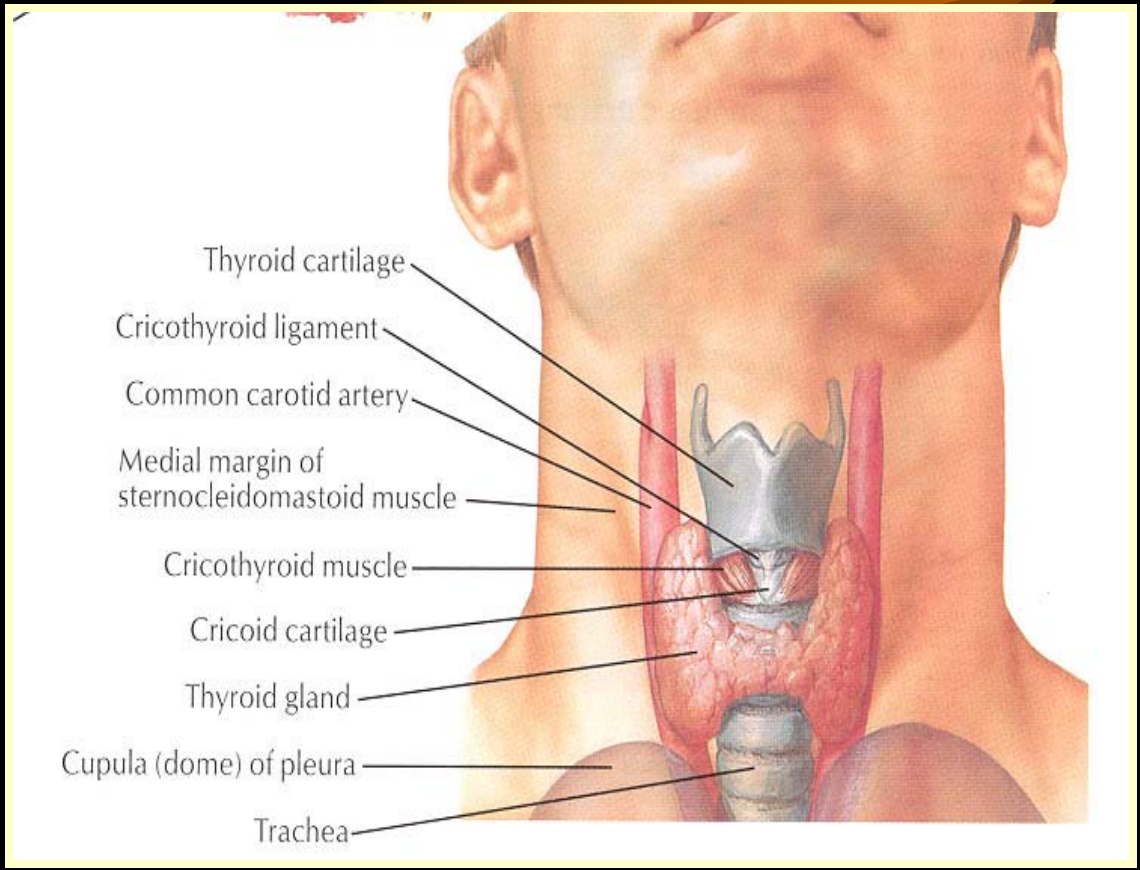
- **Neck mass**
- **Hoarseness**
- **Unilateral nasal blockage**
  - In children
  - In adult and elderly
- **Ear pain with normal exam**
- **Epistaxis**
  - In adult
  - In children
- **None healing ulcer**
- **Facial weakness or numbness**
- **Dysphagia or odynophagia**
- **Diplopia**
- **Pain with denture or poorly fitting denture**

General Considerations

- **Location**
  - Congenital masses: consistent in location
  - Metastatic masses: key to primary lesion
- **Patient age**
  - Pediatrics (0 – 15 years): mostly benign
  - Young adults (16 – 40 years): similar to pediatric
  - old adults (>40 years): High risk of malignancy
- **Time Line**

Anatomical Considerations

- **Prominent landmarks**
- **Triangles of the neck**
  - Lymphatic levels
- **Carotid bulb**



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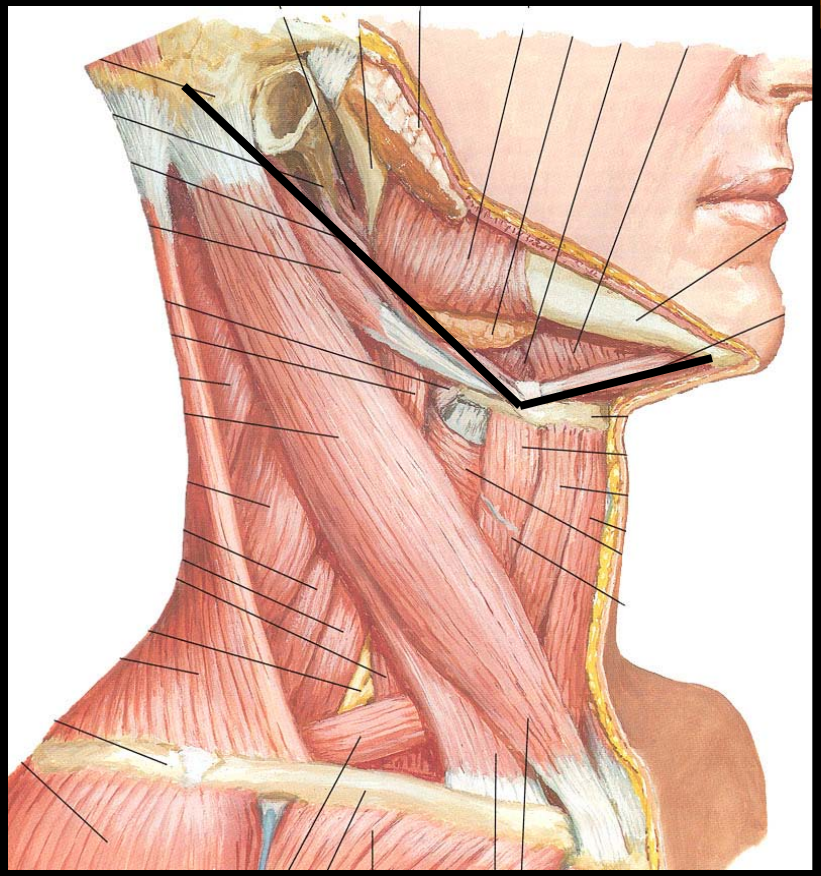

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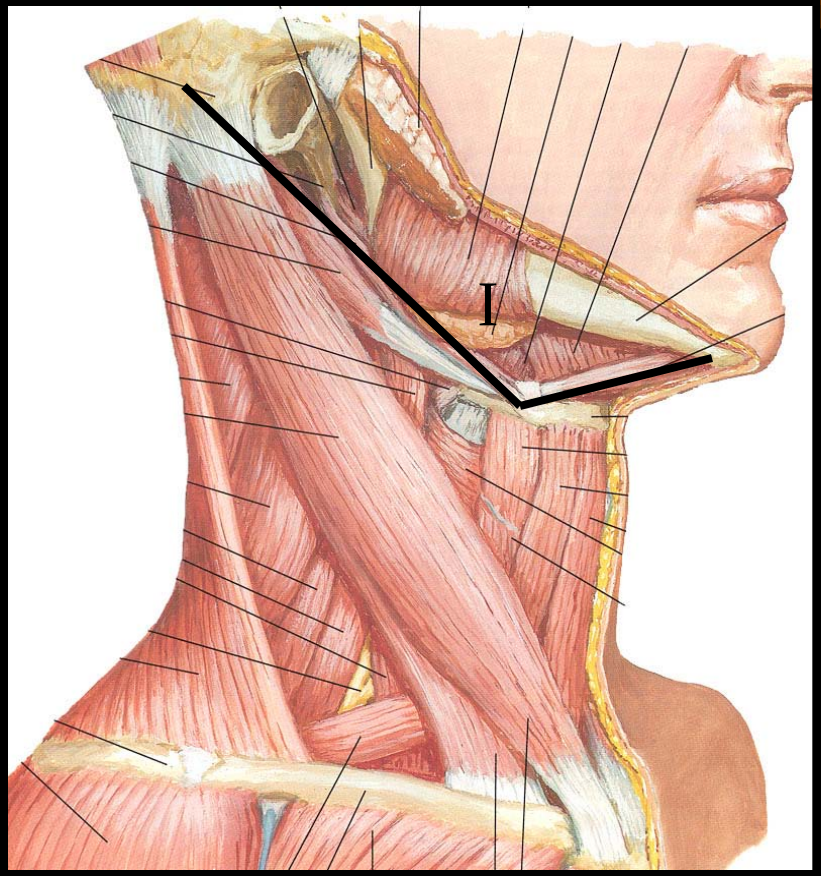

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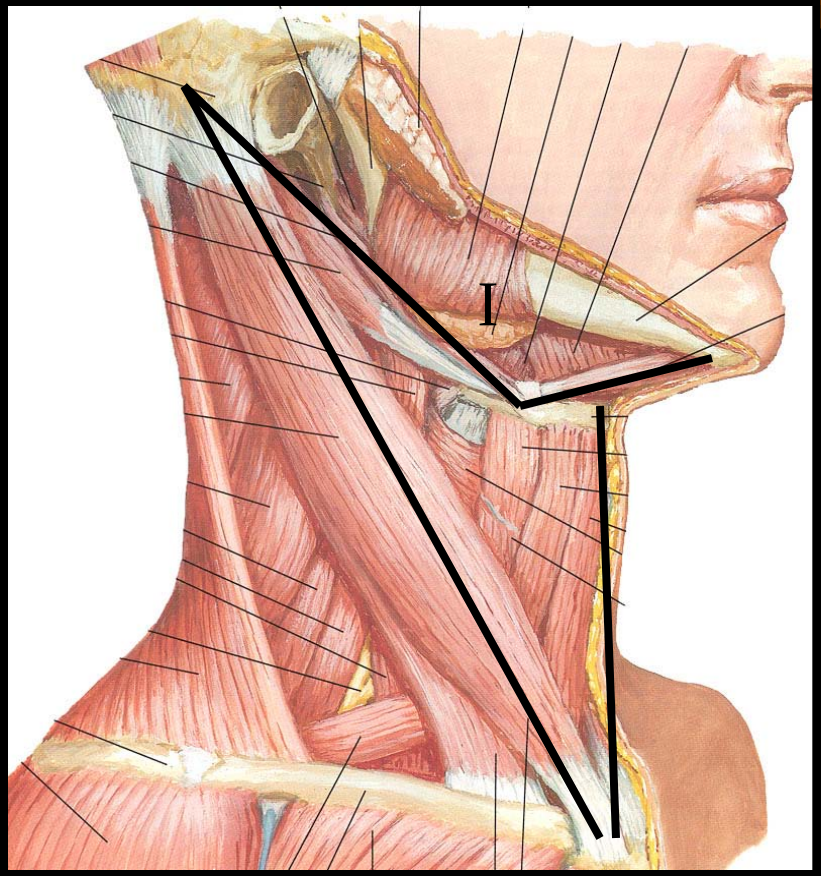

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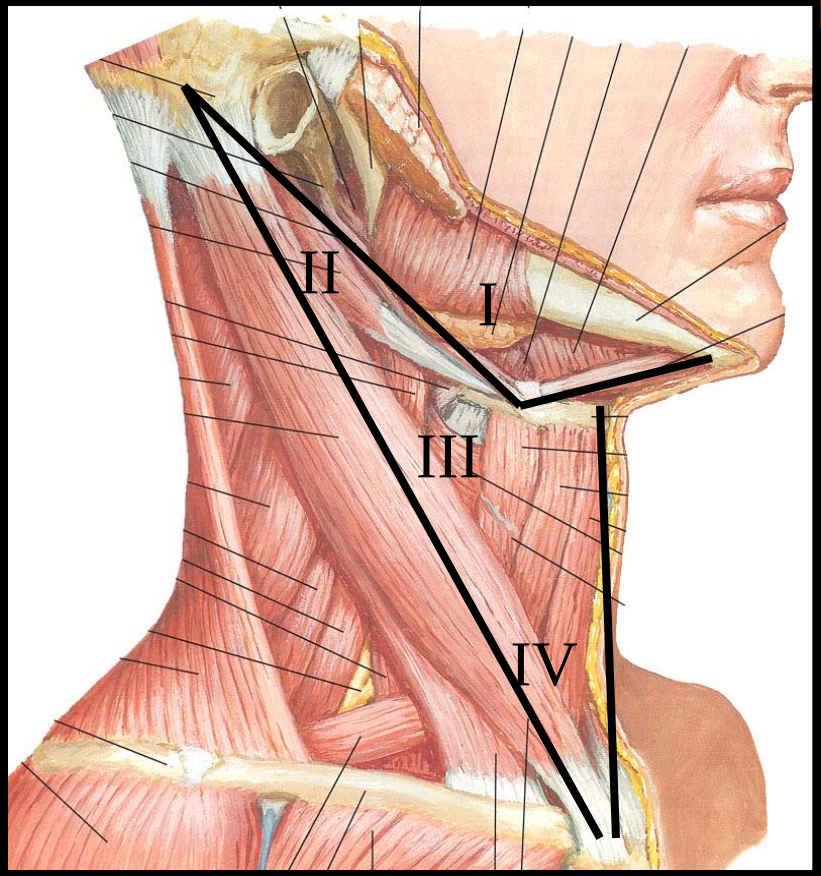

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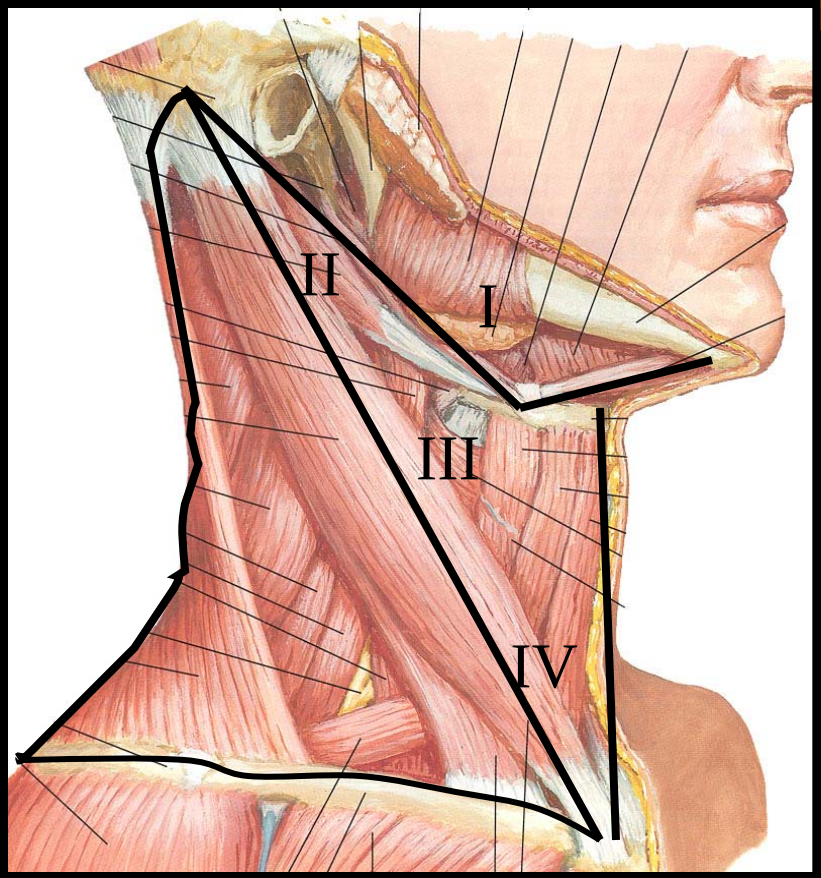

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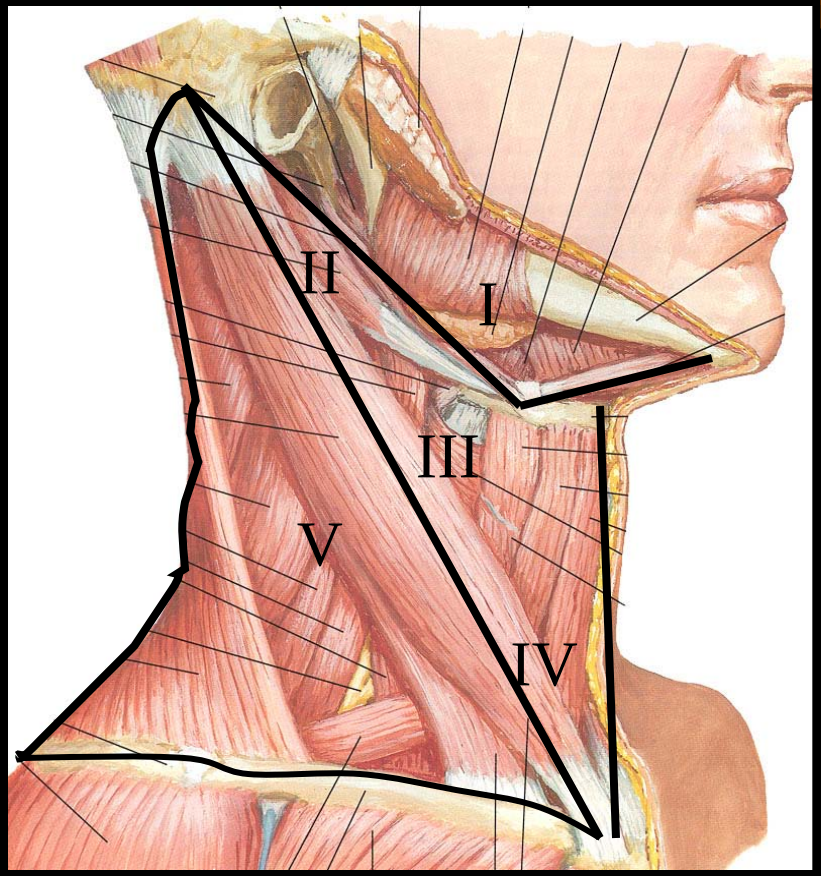

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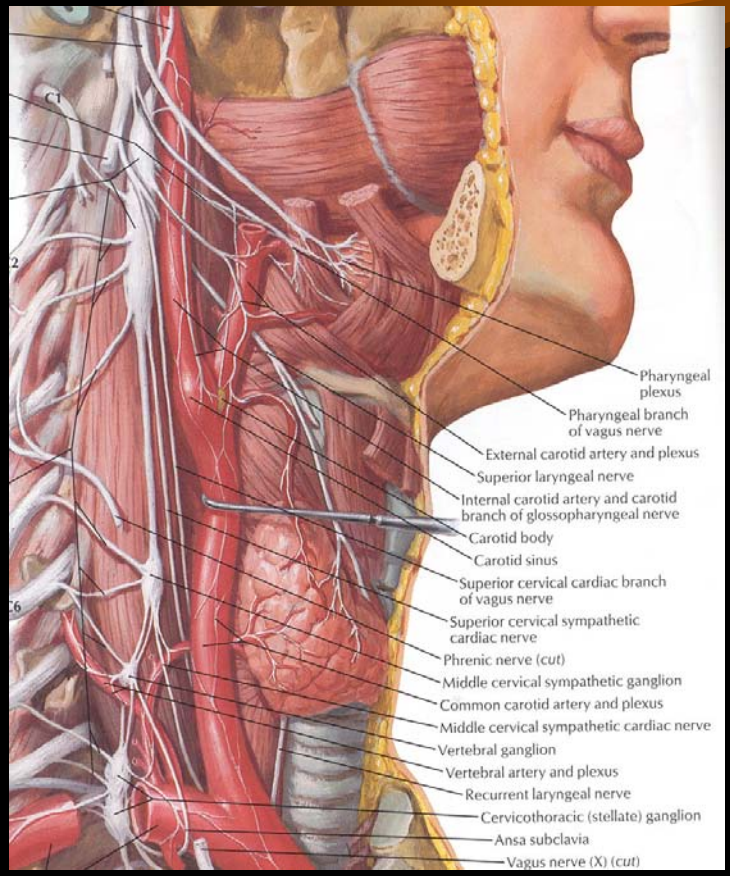
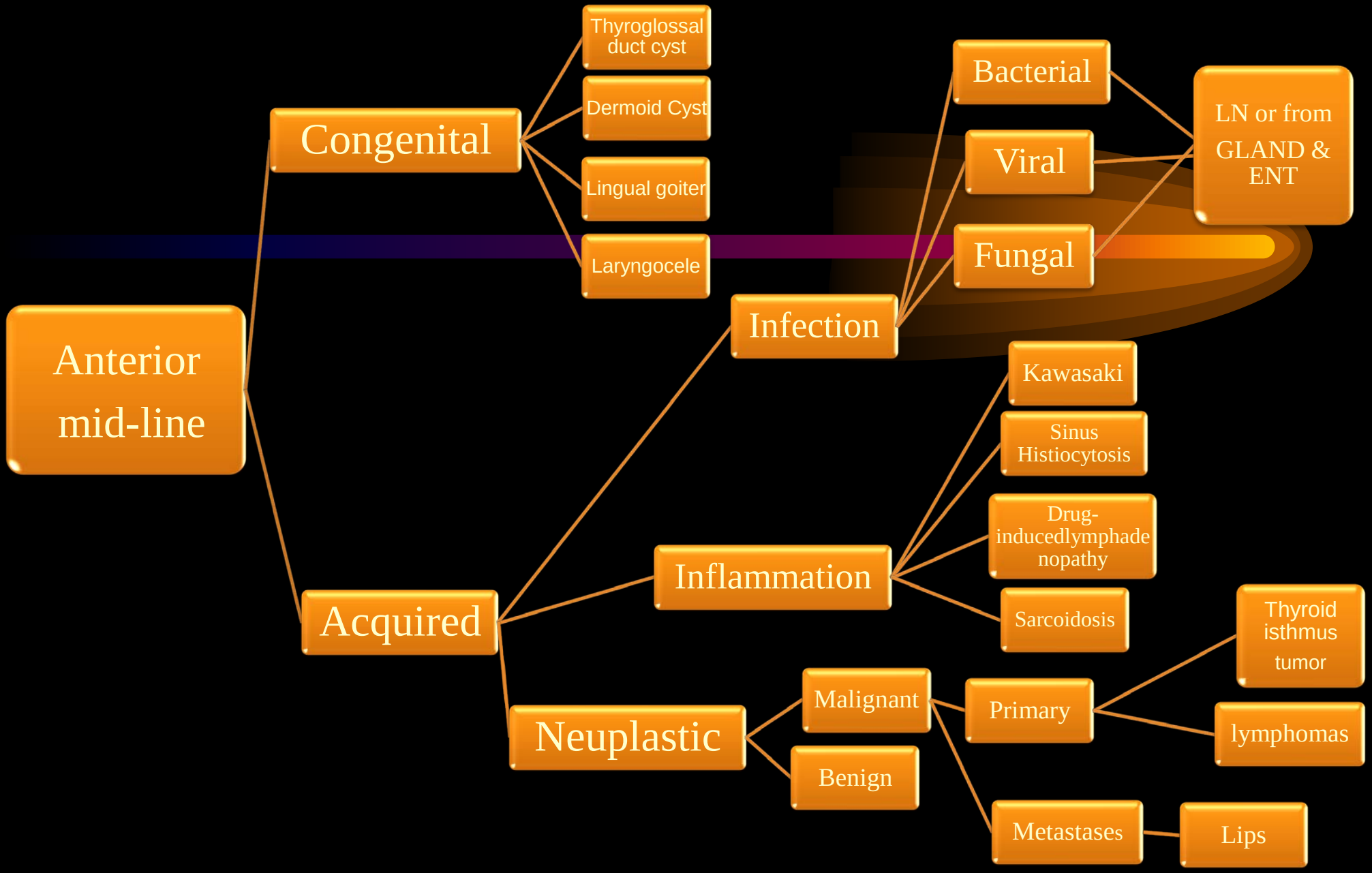



Anterior mid-line
Congenital
Thyroglossal duct cyst
Dermoid Cyst
Lingual goiter
Laryngocele
Acquired
Infection
Bacterial
Viral
Fungal
LN or from GLAND & ENT
Inflammation
Kawasaki
Sinus Histiocytosis
Drug-inducedlymphadenopathy
Sarcoidosis
Neuplastic
Malignant
Benign
Primary
Thyroid isthmus tumor
lymphomas
Metastases
Lips

Anterior triangle

Congenital

- Branchial cyst
- Thymic cyst
- Hemangioma
- Torticollis

Acuired

Infection And inflammation

Acquired

- Benign

i. Lipoma
ii. Neurofibroma
iii. Carotid body tumour
iv. Salivery G lesions
v. Thyroid

- Malignant
- Primary

Posterior triangle

- **Congenital :**

Lymphangioma (cystic hygroma)

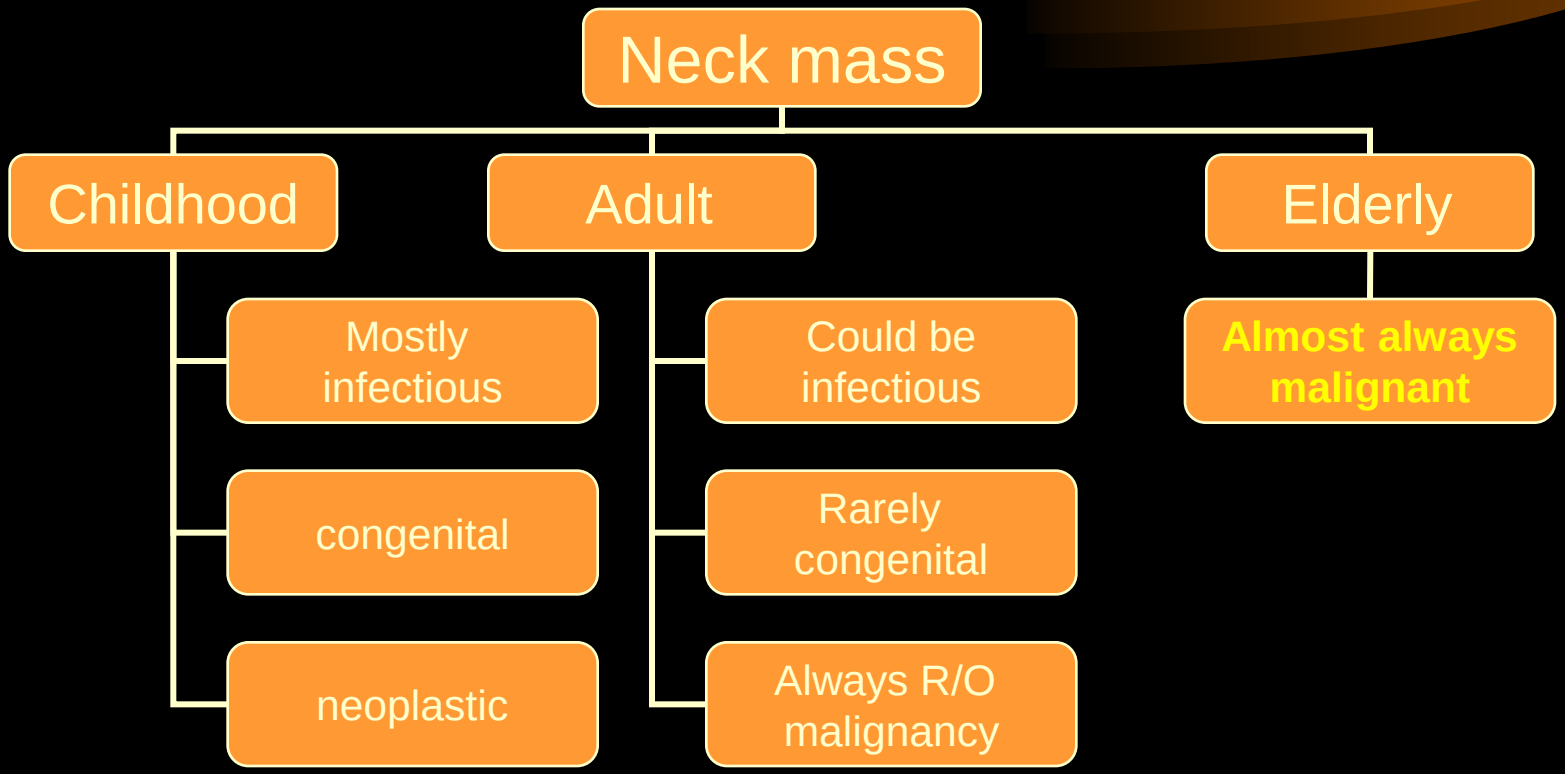
- **Acquired:**

Lymphadenitis

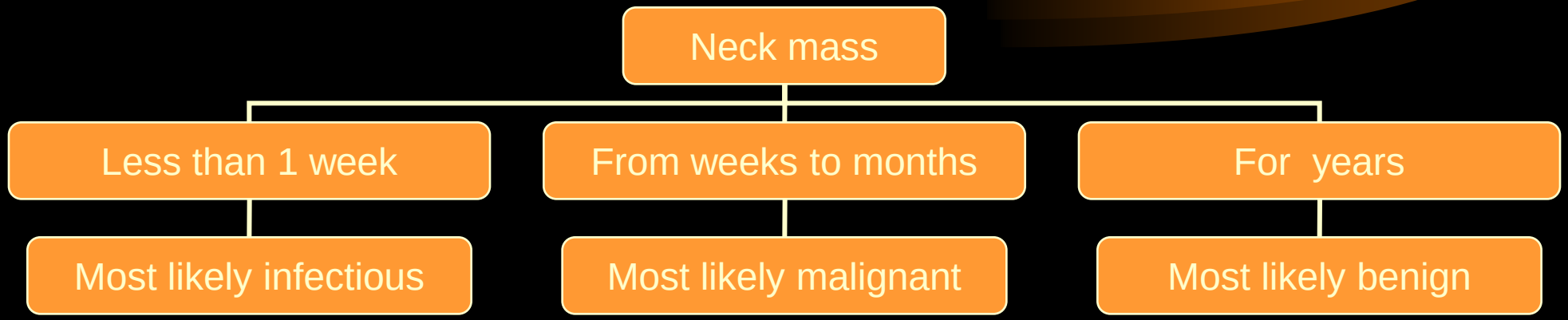
Lymphoma

Metastatic ca.

Age


Neck mass
Childhood
Adult
Elderly
Mostly infectious
congenital
neoplastic
Could be infectious
Rarely congenital
Always R/O malignancy
Almost always malignant

Time line


Neck mass
Less than 1 week
From weeks to months
For years
Most likely infectious
Most likely malignant
Most likely benign

Empirical Antibiotics

- **Inflammatory mass suspected**
- **Two week trial of antibiotics**
- **Follow-up for further investigation**

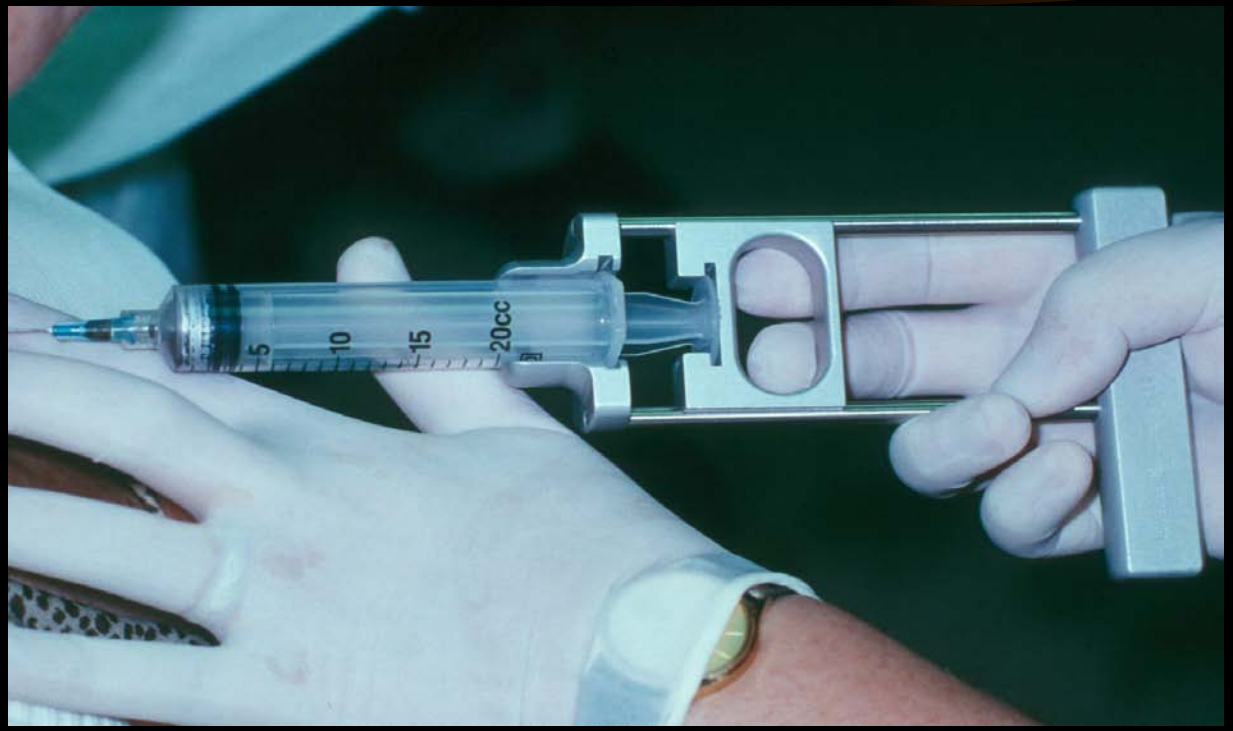
Diagnostic Tests

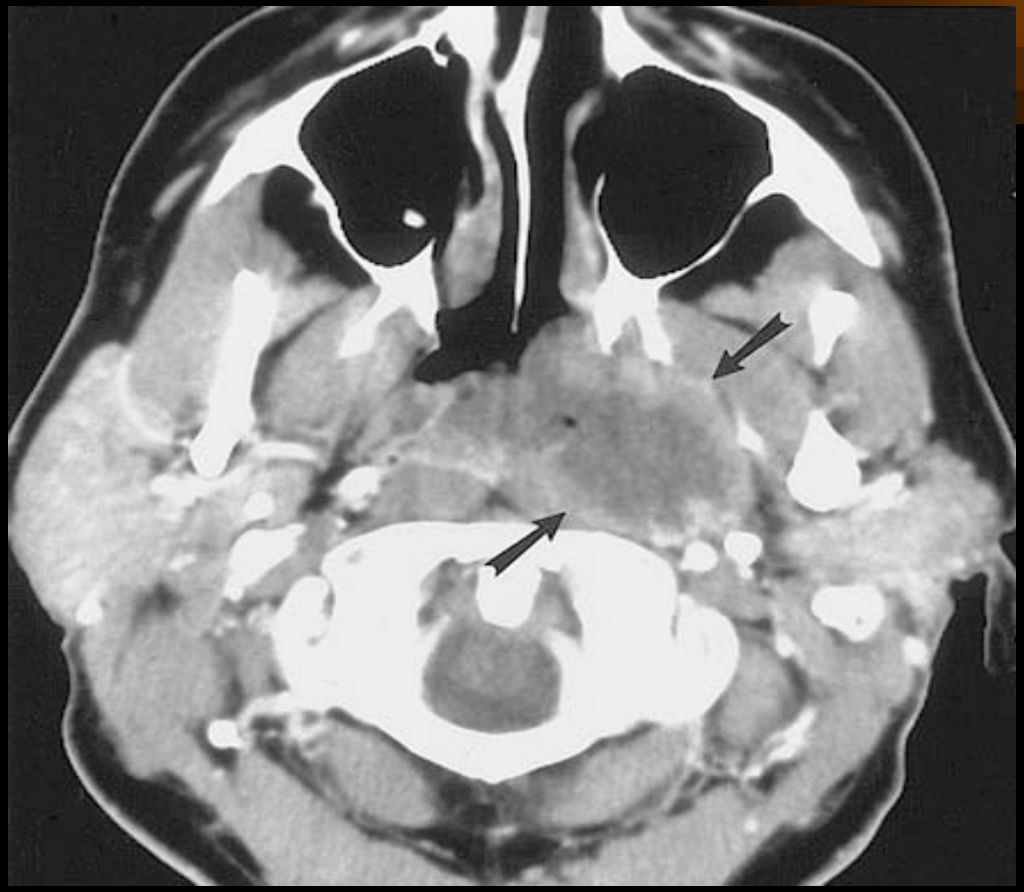
- **Fine needle aspiration biopsy (FNAB)**
- **Computed tomography (CT)**
- **Magnetic resonance imaging (MRI)**
- **Ultrasonography**
- **Radionucleotide scanning**

Fine Needle Aspiration Biopsy

- **Standard of diagnosis**
- **Indications**
  - Any neck mass that is not an obvious abscess
  - Persistence after a 2 week course of antibiotics
- **Small gauge needle**
  - Reduces bleeding
  - Seeding of tumor – not a concern
- **No contraindications (vascular ?)**

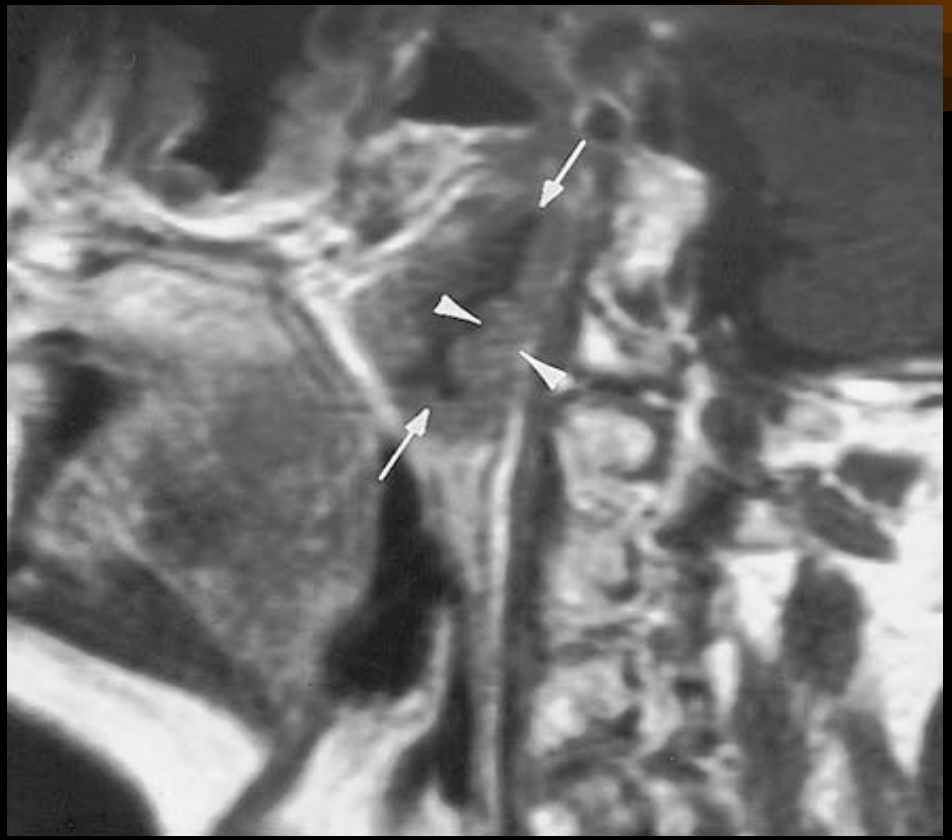
Fine Needle Aspiration Biopsy





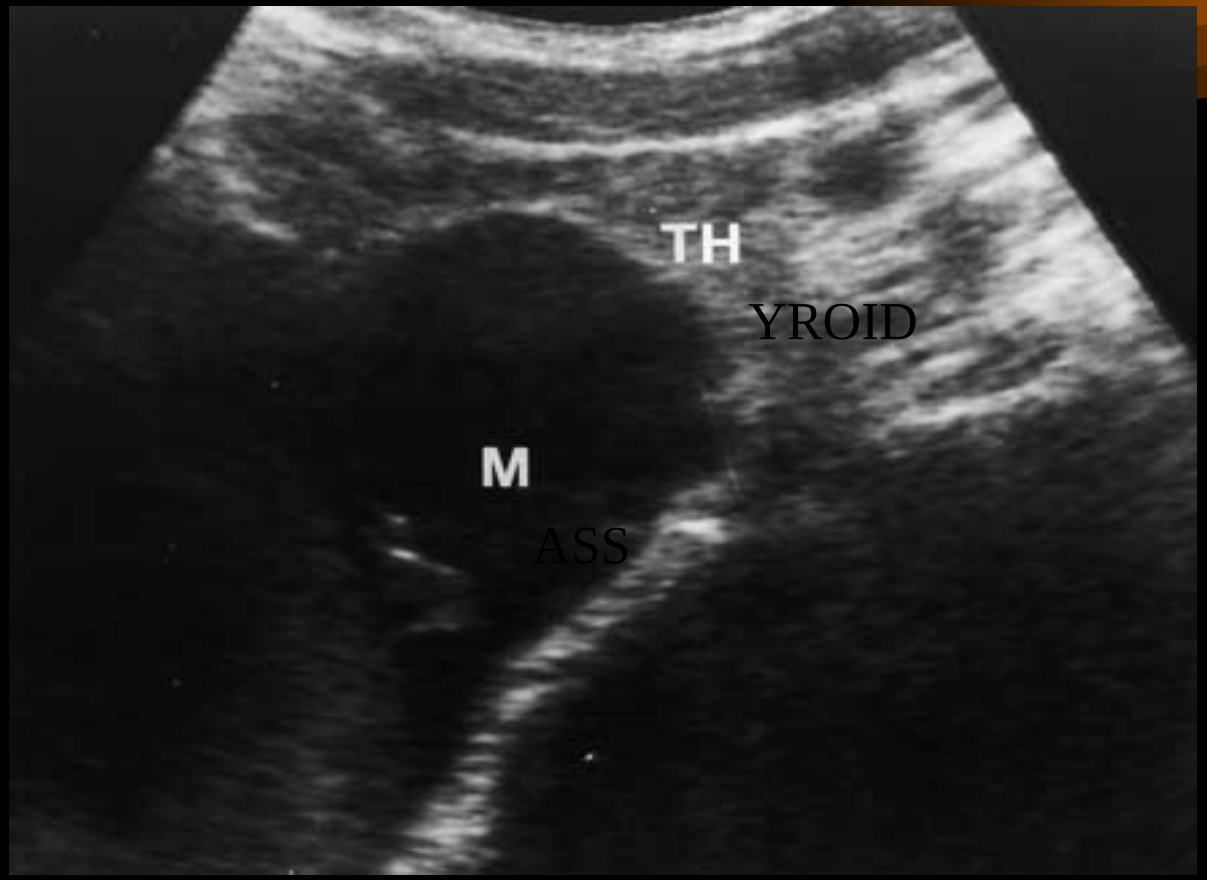
Computed Tomography

- **Distinguish cystic from solid**
- **Extent of lesion**
- **Vascularity (with contrast)**
- **Detection of unknown primary (metastatic)**
- **Pathologic node (lucent, >1.5cm, loss of shape)**
- **Avoid contrast in thyroid lesions**



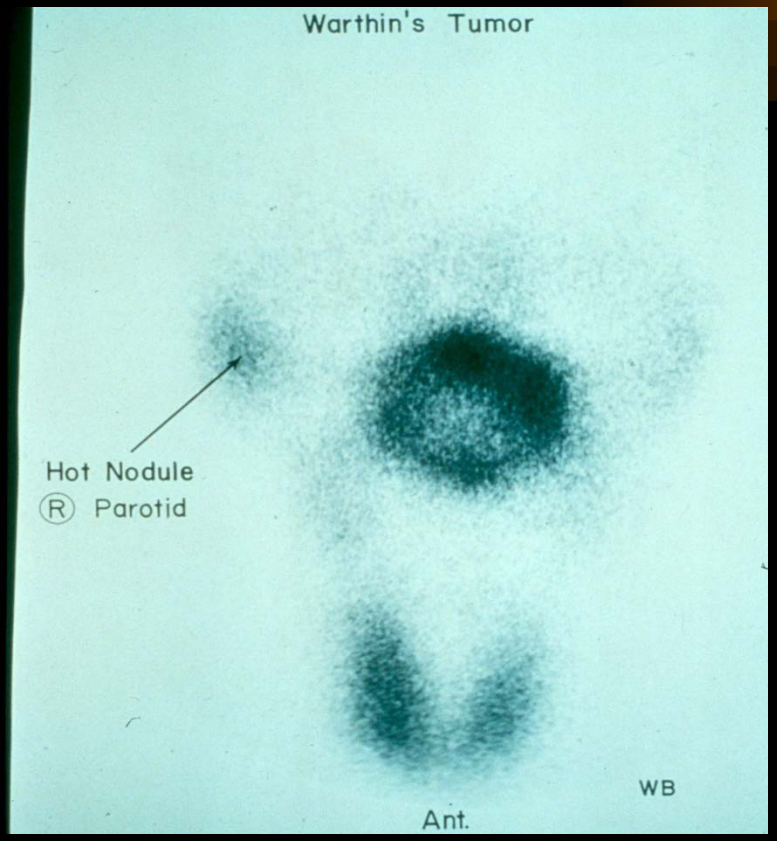
Magnetic Resonance Imaging

- **Similar information as CT**
- **Better for upper neck and skull base**
- **Vascular delineation with infusion**


TH
YROID
M
ASS

Ultrasonography

- **Less important now with FNAB**
- **Solid versus cystic masses**
- **Congenital cysts from solid nodes/tumors**
- **Noninvasive (pediatric)**


Warthin's Tumor
Hot Nodule
R Parotid
WB
Ant.

Radionucleotide Scanning

- **Salivary and thyroid masses**
- **Location – glandular versus extra-glandular**
- **Functional information**

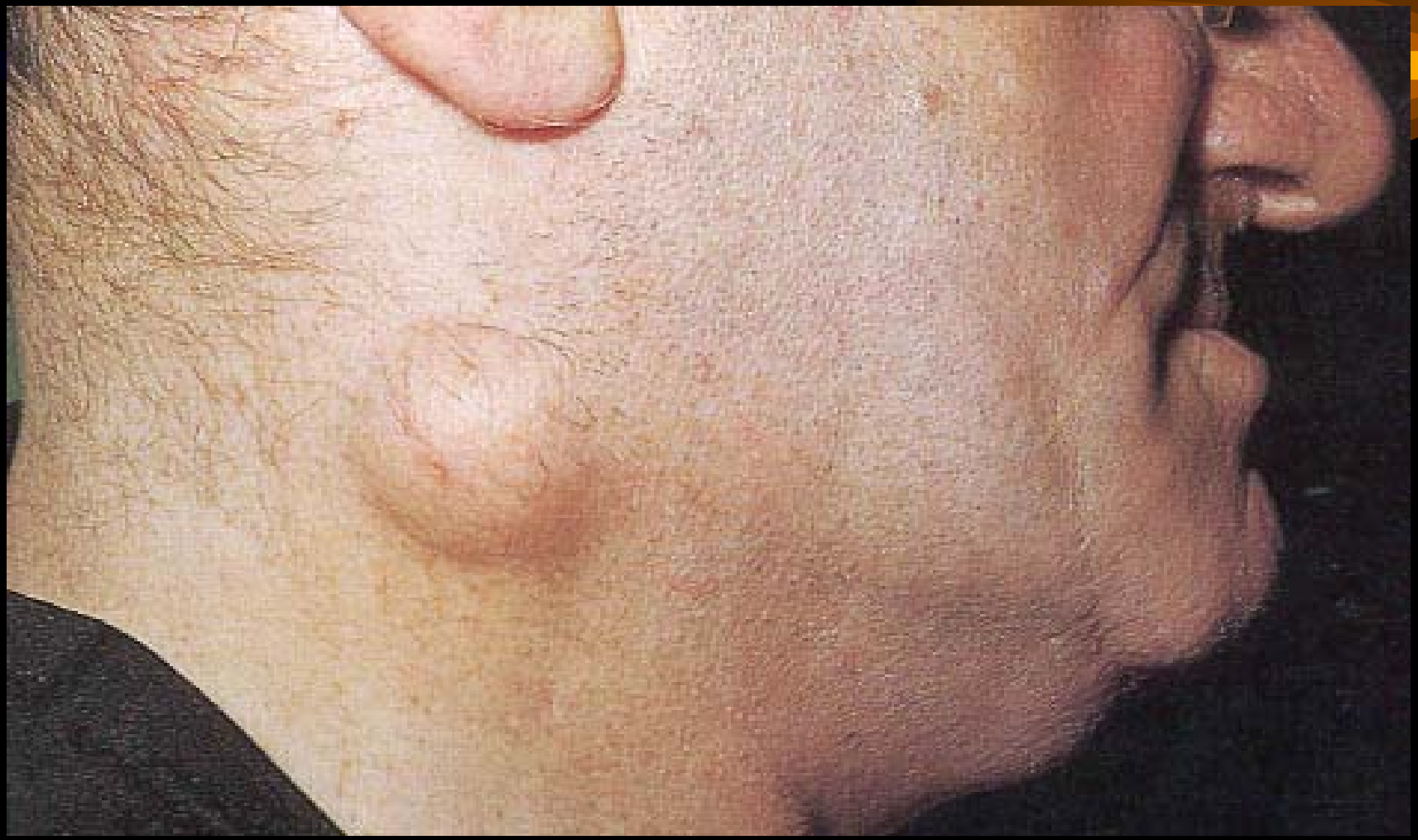
Differential Diagnosis

Table 1. Common Neck Masses

Neoplastic	Congential/Developmental	Inflammatory
Metastatic Unknown primary epidermoid carcinoma	Sebaceous cysts	Lymphadenopathy
Primary head and neck epidermoid carcinoma or melanoma	Branchial cleft cysts	Bacterial
Adenocarcinoma	Thyroglossal duct cysts	Viral
Thyroid	Lymphangioma/hemangioma	Granulomatous
Lymphoma	Dermoid cysts	Tuberculous
Salivary	Ectopic thyroid tissue	Catscratch
Lipoma	Laryngocele	Sarcoidosis
Angioma	Pharyngeal diverticulum	Fungal
Carotid body tumor	Thymic cysts	Sialadenitis
Rhabdomyosarcoma		Parotid
		Submaxillary
		Congenital cysts
		Throtrast granulomas

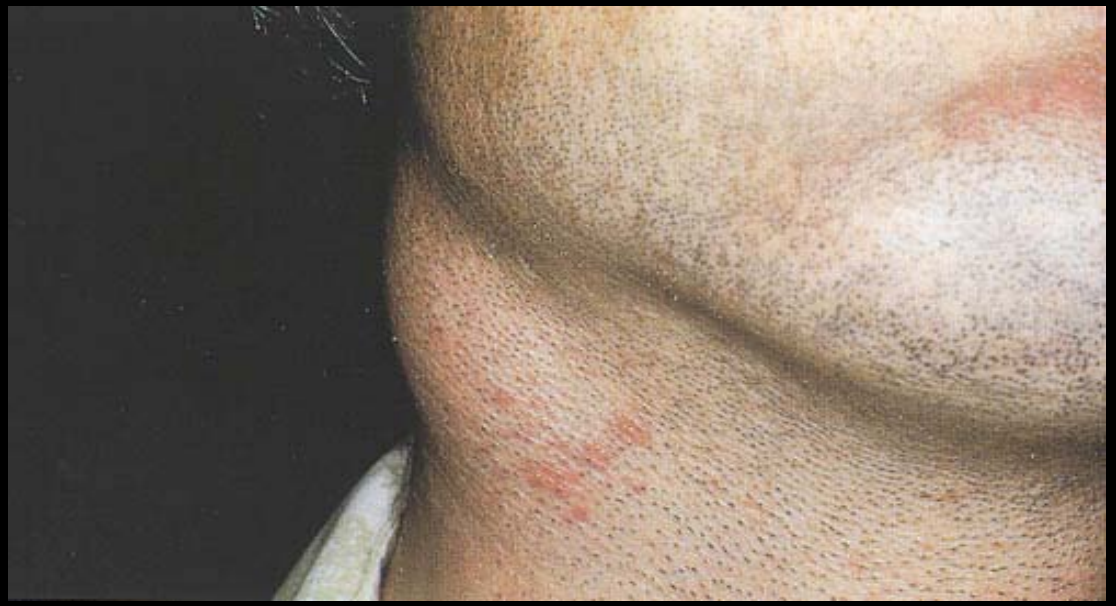
Congenital and Developmental Mass

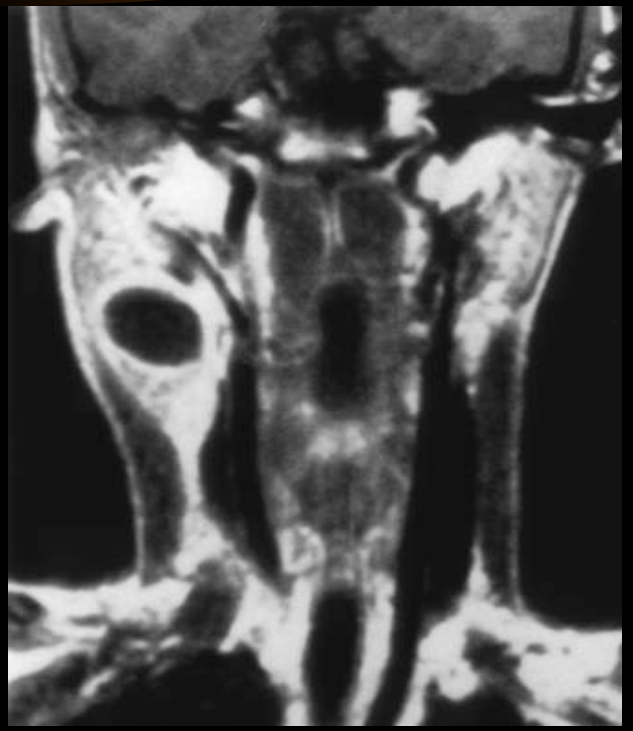
- **Epidermal and sebaceous cysts**
- **Branchial cleft cysts**
- **Thyroglossal duct cyst**
- **Vascular tumors**



Sebaceous Cysts

- **Older age groups**
- **Clinical diagnosis**
  - Elevation and movement of overlying skin
- **Rx: Excision**



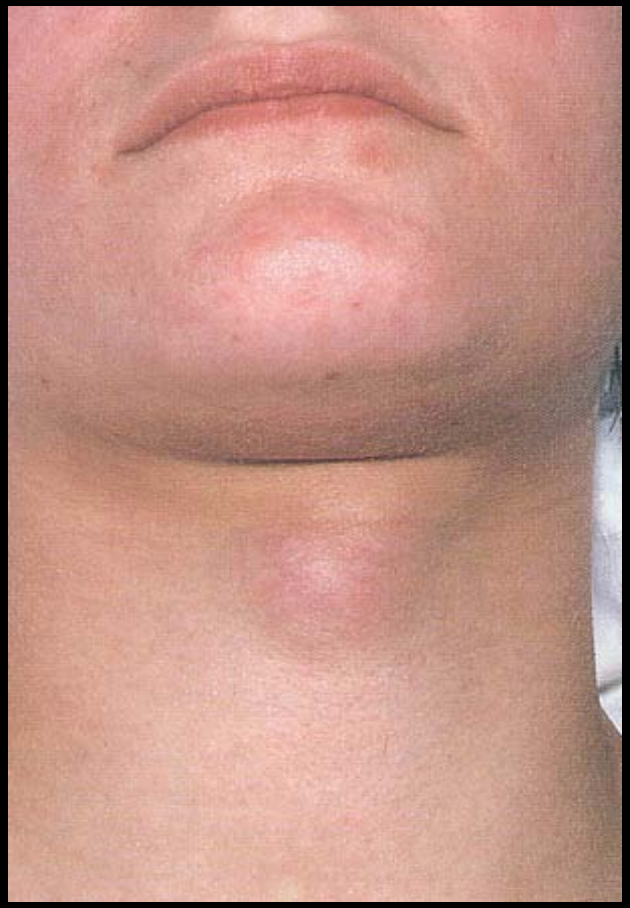


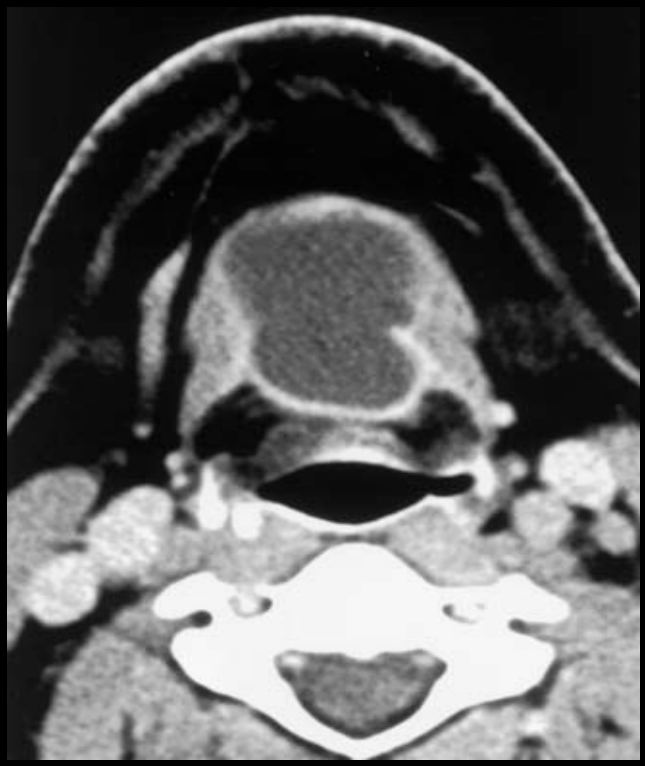
Branchial Cleft Cysts

- **Present in older children or young adults often following URI**
- **2nd cleft most common (95%) – tract medial to XII nerve between internal and external carotids**
- **1st cleft less common – close association with facial nerve possible**
- **3rd and 4th clefts rarely reported**

Branchial Cleft Cysts

- **Most common as smooth, fluctuant mass underlying the SCM**
- **Skin erythema and tenderness if infected**
- **Treatment**
  - Initial control of infection
  - Surgical excision, including tract
  - May necessitate a total parotidectomy (1st cleft)



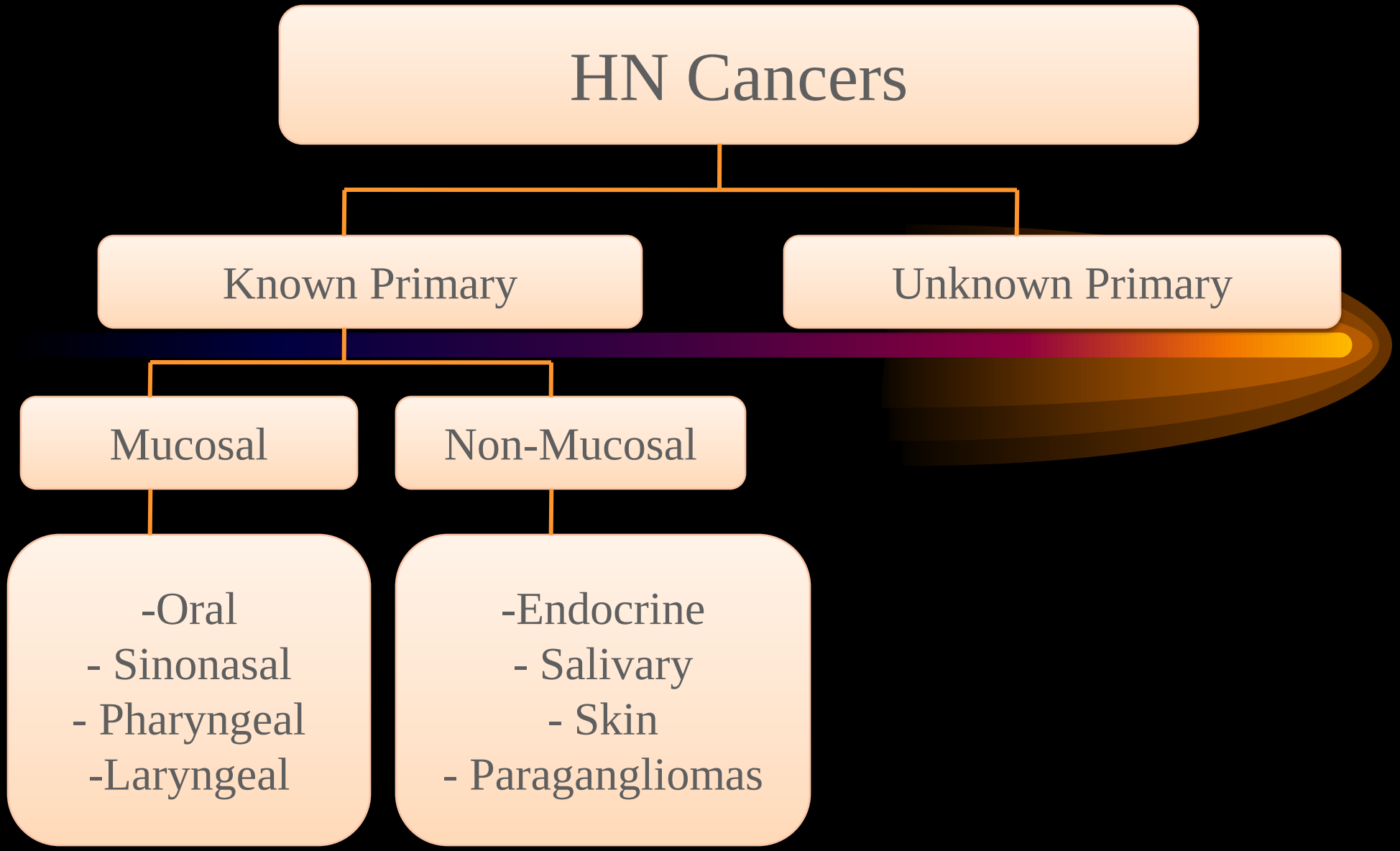


Thyroglossal Duct Cyst

- **Most common congenital neck mass (70%)**
- **50% present before age 20**
- **Midline (75%) or near midline (25%)**
- **Usually just inferior to hyoid bone (65%)**
- **Elevates on swallowing/protrusion of tongue**
- **Treatment:surgical removal (Sis trunk) after resolution of any infection**

Summary

- **Extensive differential diagnosis**
- **Age of patient is important**
- **Accurate history and complete exam essential**
- **FNAB – important diagnostic tool**
- **Possibility for malignancy in any age group**
- **Close follow-up and aggressive approach is best for favorable outcomes**


HN Cancers
Known Primary
Unknown Primary
Mucosal
Non-Mucosal
-Oral
- Sinonasal
- Pharyngeal
-Laryngeal
-Endocrine
- Salivary
- Skin
- Paragangliomas

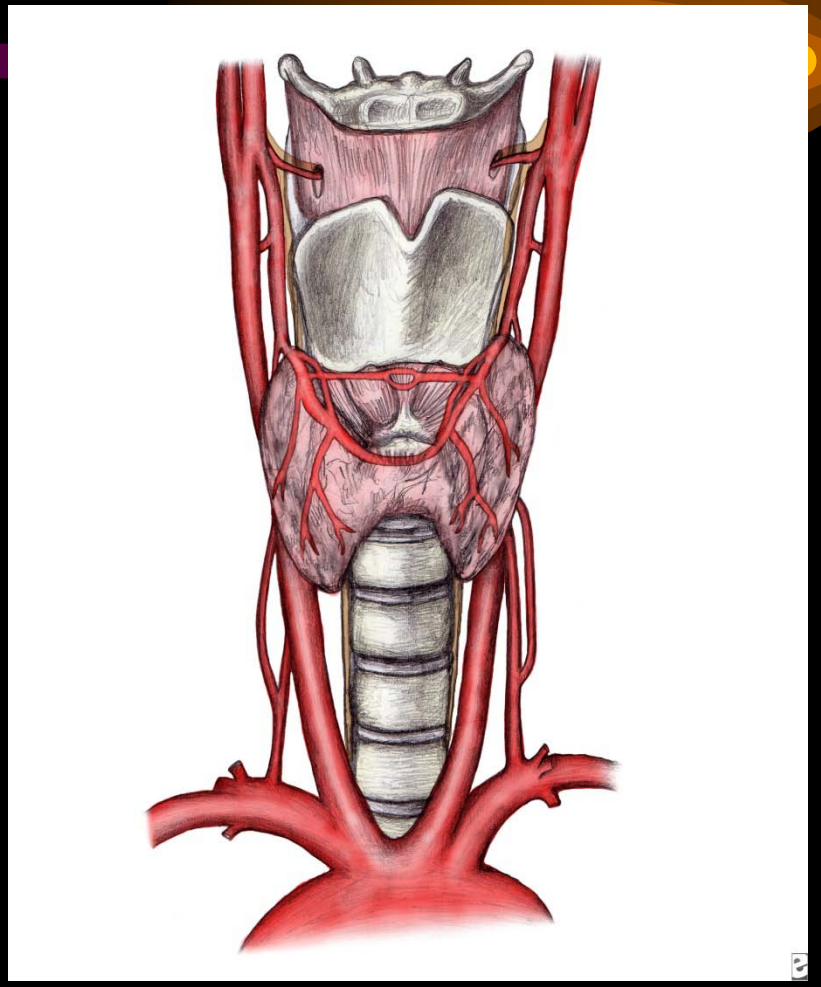
Thyroid Gland

Thyroid Gland

- **Anatomy**
- **Evaluation of Thyroid Nodule**
- **Thyroid Cancer: Types & Treatment**

Thyroid Anatomy

- **Shield shaped, may be H- or U-shaped**
- **2 lateral lobes connected by an isthmus**
- **Isthmus at level of 2nd to 4th tracheal cartilages (may be absent)**



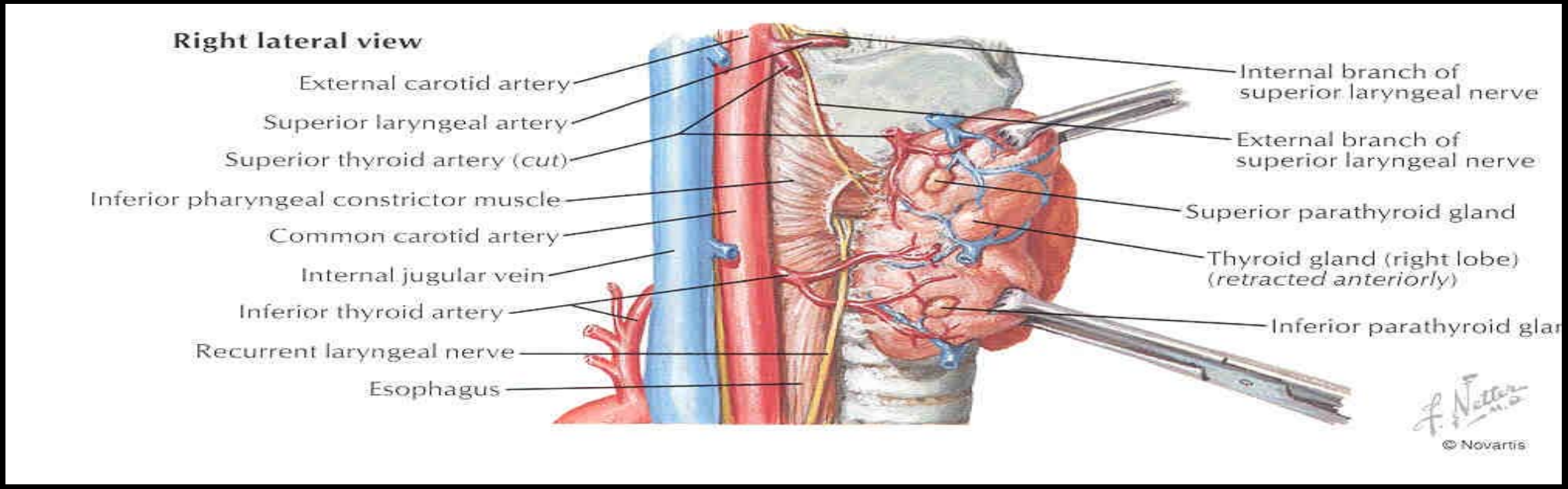
Lobes of Thyroid

- **Each lobes measures approx 4cm high, 1.5cm wide, 2cm deep**
  - Lobes have superior and inferior poles
- **Superior pole: may extend as far as the oblique line of the thyroid cartilage**
- **Inferior pole: may extend inferiorly as far as the 5^{th} or 6^{th} tracheal rings**

Arterial Blood Supply

- **Superior thyroid artery (STA)**
  - 1st branch of ECA
  - Followed by SLN until superior pole
  - Anastamoses with contralateral STA

- **Inferior thyroid artery (ITA)**
  - From thyrocervical trunk (1st part of subclavian at 1st rib)



Venous Drainage

- **3 pairs of veins**
  - Superior thyroid vein
    - Parallels course of STA on ant surface thyroid
    - Ascends to drain into internal jugular vein (IJV)
  - Middle thyroid vein
    - Direct lateral course from thyroid to IJV
    - Shortest of 3 veins
  - Inferior thyroid vein
    - Ant surface thyroid (opposite of ITA)
    - Vertical downward course to brachiocephalic v.

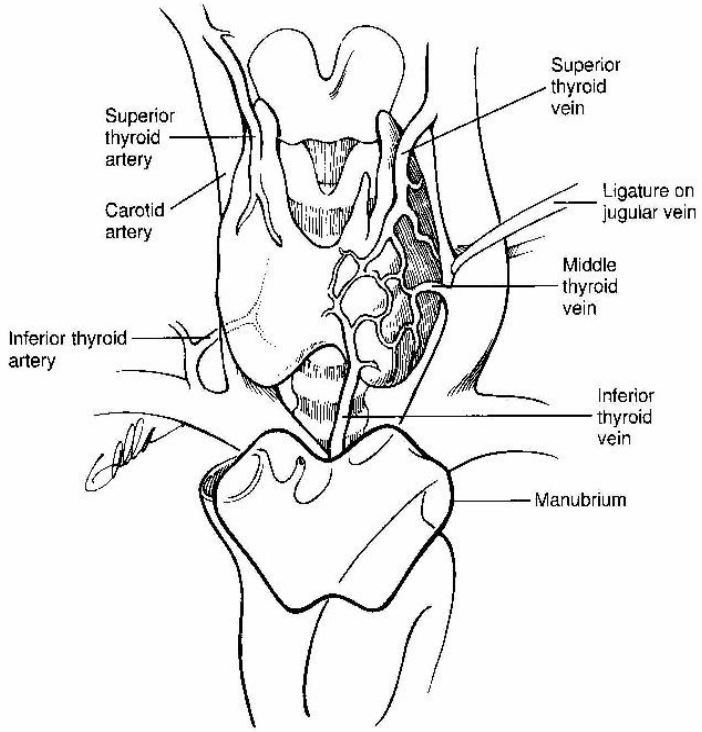


Figure 28-3. Superior thyroid and inferior thyroid arteries (left figure) and superior, middle, and inferior thyroid veins (right figure).

Thyroid Nodule - Evaluation

- **Start with Hx ,P/E**

- **Pre-operative Laryngoscopy**
  - Assess RLN function / infiltration
  - Essential in revision cases (6.7% of patients with previous thyroid surgery had VC paralysis)

Thyroid Nodule - Evaluation

- **U/S**
- **FNA**
- **Thyroid Function Tests**

Thyroid Imaging

- **U/S**
  - Often first modality, helps delineate architecture
  - Accessible, inexpensive, safe
  - Help locate nodule, assist with FNA
  - Micro-calcifications and central blood flow
    - Suggests CA
  - Not useful for large masses

Thyroid Imaging Cont'd

- **CT**
  - Useful for cervical lymphadenopathy
  - Dye can interfere with function testing and radioactive treatment for up to 8 weeks
- **MRI**
  - Used less commonly
- **Scintigraphy**
  - Hard to distinguish benign vs malignant nodule

Thyroid Biopsy

- **FNA**
  - Gold standard
  - Sensitivity → 65% to 98%
  - Specificity → 72% to 100%
- **Results**
  - Benign → adenoma, goitre, thyroiditis
  - Malignant → most common PTC
  - Indeterminate → FTC and Hurthle most common
  - Non-diagnostic → re-aspiration diagnostic in 50%

Thyroid Biopsy

- **FNA Disadvantages**
  - Inability to distinguish benign microfollicular adenomas from differentiated FTC
  - Inability to distinguish Hurthle cell lesion from adenoma or Hashimoto thyroiditis

Management of the Thyroid Nodule

Serial exam

- **Physical examination**
  - Benign
  - Asymptomatic palpable nodule
- **U/S**
  - F/u a benign, non palpable nodule
  - F/u a cystic nodule for reaccumulation

Management of the Thyroid Nodule

- **Trial of suppression of TSH**
  - Benign or indeterminate FNA (controversial)
  - Maintain TSH level between 0.1 and 0.5 mlU/L per day
  - Decrease tumor volume up to 50% in 40% pts.
  - A shrinking tumor is not likely malignant

Malignant Thyroid Lesions

1. Well Differentiated (85%)

- Papillary Thyroid Carcinoma (PTC)
- Follicular Thyroid Carcinoma (FTC)
- Hurthle Cell Carcinoma (HCC)

2. Poor differentiated malignant neoplasms

- Medullary thyroid carcinoma (MTC)

- Anaplastic thyroid carcinoma (ATC)

3. Other malignant tumors:

- Lymphoma

- Metastatic tumors

Malignant Thyroid Lesions

- **Risk factors for Thyroid Cancer**
  - Age (<20 or >60)
  - Male (Female > risk of nodules)
  - Rapid Growth
  - Invasive or compressive Symptoms
  - Previous Radiation exposure
  - Prior Thyroid disease
    - Goiter, Hashimoto, Grave's, adenomas
  - Family Hx

Papillary Thyroid Carcinoma (PTC)

- **Lymph node involvement in 30%**
- **Distant mets least common**
  - 1 - 25% during illness or 1 - 7% at Dx
- **Predisposing Factors**
  - Ionizing radiation
  - 5 - 10% of pts have +ve Family Hx
- **Clinical presentation**
  - Young females, palpable mass in thyroid or cervical LN (1/3rd have lymphadenopathy)

Follicular Carcinoma

- **13% of all thyroid carcinomas**
- **Hematogenous spread more common than PTC**
- **More aggressive, well differentiated compared to PTC**
- **10 yr survival = 60% (PTC = 95%)**
- **Malignant lesion = capsular +/- vascular invasion**

Hurthle Cell Carcinoma

- **Subtype of FTC (15% of FTC's)**
- **Like FTC, cannot exclude carcinoma vs adenoma based of FNA or frozen**
- **Clinical Presentation**
  - Thyroid nodule or mass
  - 35 % will have distant mets during illness
  - Higher rate of nodal mets than FTC

Management WDTC

Surgical options:

- **Total thyroidectomy (>1.5cm)**
- **Thyroid lobectomy (<1.5cm)**
- **+/- Neck dissection**

Adjuvant Therapy:

- **Post-op I-131**
- **External beam RT**
  - Tumors that do not pick up I-131
  - Advanced disease (mets, residual disease)

Medullary Thyroid Carcinoma

- **Sporadic (80%)**
  - More aggressive type
  - Late presentation (age 40 – 60)
  - Early mets to regional lymph nodes (50%)

Medullary Thyroid Carcinoma

- **Familial (20%)**
  - MEN IIA, MEN IIB, Non-endocrinopathic
  - Mutation in RET-protooncogene
  - Autosomal Dominant
  - Early presentation (birth – 20's)

TABLE 115.4. MULTIPLE ENDOCRINE NEOPLASIA SYNDROMES

Wermer syndrome (MEN type I)
Parathyroid adenomas or hyperplasia, usually adenomas
Pituitary tumors
Pancreatic tumors
Miscellaneous
Carcinoid tumors
Ovarian tumors
Differentiated thyroid carcinoma
Melanoma
Sipple syndrome
Type IIA
Parathyroid hyperplasia or adenoma
Medullary thyroid carcinoma (100%)
Pheochromocytoma (bilateral in 60%–75% of patients)
Type IIB
Same as type IIA except for
Presence of mucosal neuromas
Marfanoid habitus with pectus excavatum
No hyperparathyroidism

MEN, multiple endocrine neoplasia.

Treatment of MTC

- **Total thyroidectomy with bilateral SLND**
- **Prophylactic surgery for relatives with RET mutation (preferably before age 7)**
- **No adjuvant therapy advocated**
- **Radiotherapy and chemotherapy for palliation (usually ineffective)**

Anaplastic Thyroid Carcinoma

- **Less than 5% of thyroid malignancies**
- **Highly aggressive and fatal**
- **Median survival 3 - 6 months**
- **Distant mets common (lung)**
- **Grossly, large and bulky tumors**
  - Invade into surrounding tissue
  - Rapid expansion

ATC Cont'd

- **P/E**
  - Firm, irregular mass fixed to surrounding structures
  - RLN involvement and VC paralysis common

- **Tx (often palliative intent)**
  - Surgery
  - Adjuvant RT
  - Chemotherapy

Lymphoma

- **Rarely presents within thyroid gland**
- **Dx in 60's**
- **Females > males**
- **Low - intermediate grade B-cell NHL**
- **Increased risk wth Hashimoto**
- **Clinically**
  - Rapidly expanding mass on background of Hashimoto
  - Hoarsness, dysphagia, VC paralysis, Horner Syndrome
- **Tx**
  - RT, Chemo

Post Op Complications

- **RLN Injury**
- **Hypocalcemia**
- **Hematoma**

Head & Neck Tumours
Part II

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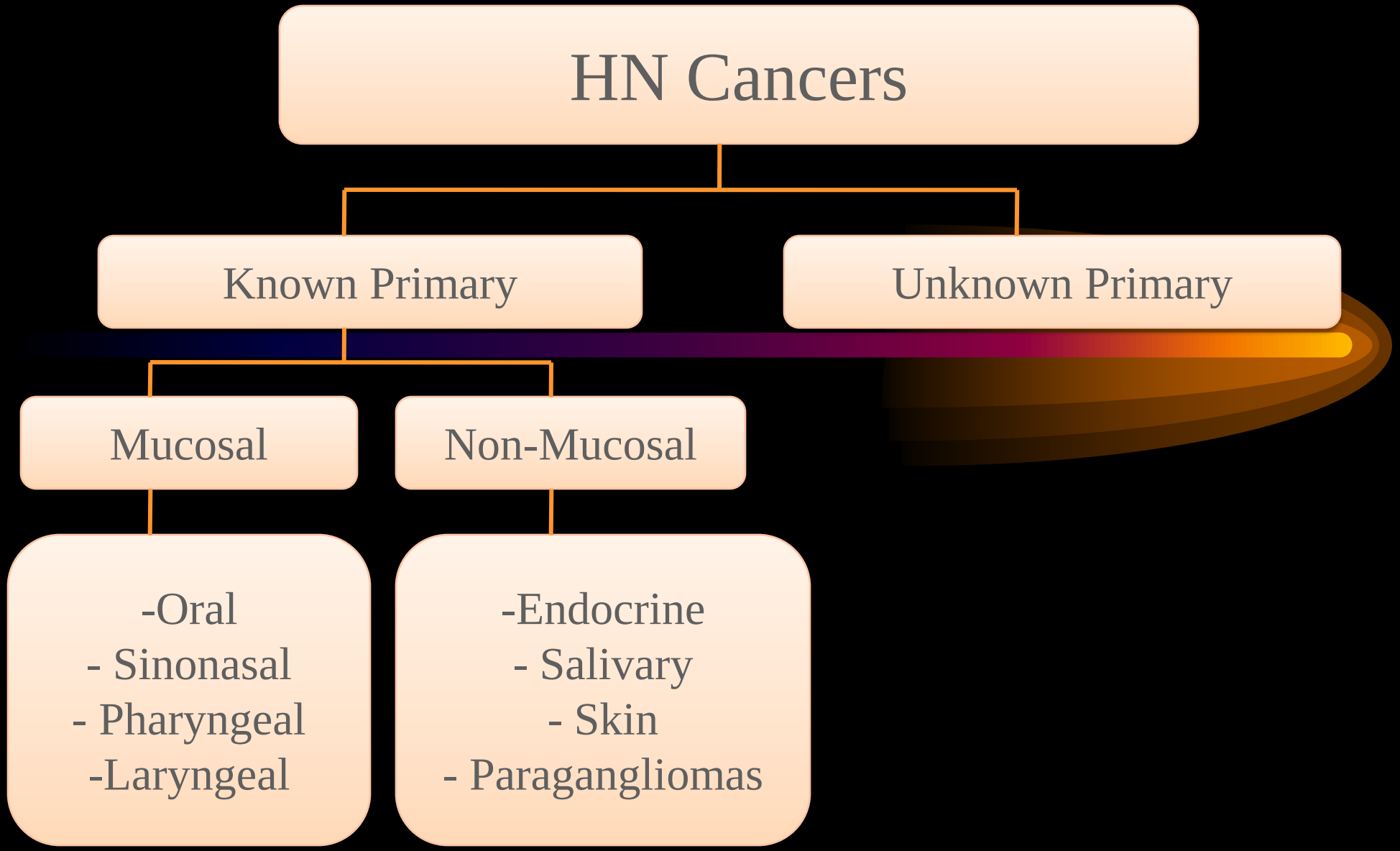
KSU, KFMC

Riyadh, Saudi Arabia


HN Cancers
Known Primary
Unknown Primary
Mucosal
Non-Mucosal
-Oral
- Sinonasal
- Pharyngeal
-Laryngeal
-Endocrine
- Salivary
- Skin
- Paragangliomas

Salivary Glands

Content

- **Anatomy**
- **Physiology**
- **Acute and Chronic Infections**
- **Auto Immune Diseases**
- **Tumours of Salivary Glands**

Basics

- **6 major salivary glands: 2 parotid, 2 submandibular, 2 sublingual.**
- **100’s of minor salivary glands lining the upper aerodigestive tract**
- **Main job…. Saliva!!!!**

Anatomy-Parotid

- **Serous cells only**
- **On side of the face, deep to skin, subcutaneous tissue, superficial to the masseter.**
- **Tail of parotid extends superficial to SCM.**

Parotid duct

- **Stensen's duct begins at anterior border of the gland 1.5cm below the zygoma.**
- **Traverses the masseter 5-6cm, pierces the buccinator.**
- **Opens in mouth lateral to 2nd upper molar.**

Submandibular gland

- **Mucous and serous cells.**
- **Submandibular triangle: anterior and posterior bellies of digastric and inferior margin of the mandible.**
- **Medial and inferior to the mandible.**

Wharton's duct

- **Exits the gland from the medial surface travels b/w the hyoglossus and mylohyoid muscles enters the genioglossus muscle and opens into mouth just lateral to lingual frenulum.**

- **CN XII inferior to the duct and lingual nerve is superior to the duct.**

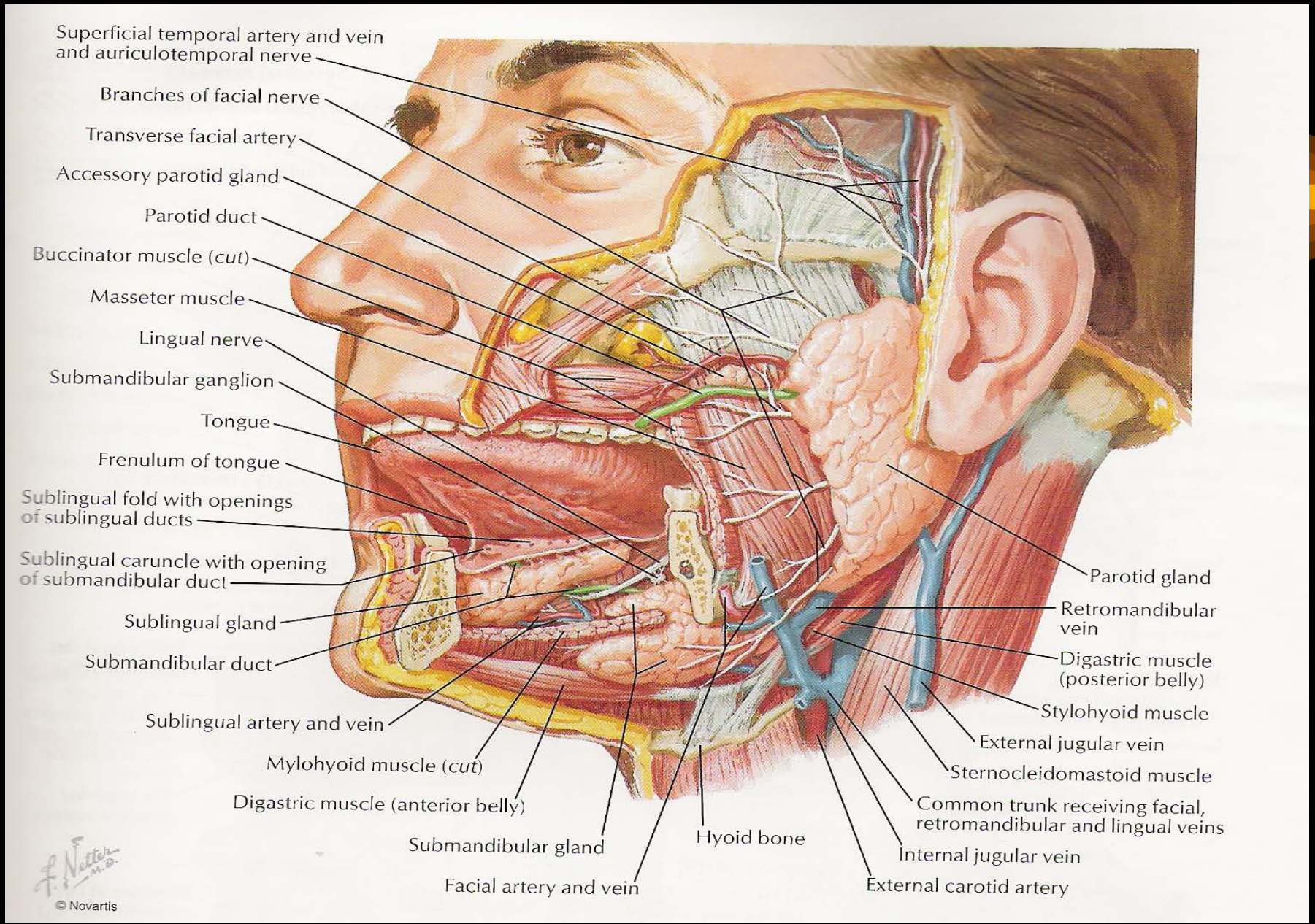
Sublingual glands

- **Mucous secreting.**
- **Just below the floor of mouth mucosa.**
- **Bordered by genioglossus/hyoglossus medially, mandible laterally, and mylohyoid inferiorly.**
- **Wharton’s duct and lingual n. travel b/w SL gland and genioglossus muscle.**
- **No fascial capsule.**

SL glands cont'd

- **Ducts of Rivinus (~10) along the superior aspect of the gland open into the mouth along sublingual fold in the floor of mouth.**

- **Innervated by the PNS/SNS systems in the same way as the SM gland.**


Superficial temporal artery and vein and auriculotemporal nerve
Branches of facial nerve
Transverse facial artery
Accessory parotid gland
Parotid duct
Buccinator muscle (*cut*)
Masseter muscle
Lingual nerve
Submandibular ganglion
Tongue
Frenulum of tongue
Sublingual fold with openings of sublingual ducts
Sublingual caruncle with opening of submandibular duct
Sublingual gland
Submandibular duct
Sublingual artery and vein
Mylohyoid muscle (*cut*)
Digastric muscle (anterior belly)
Submandibular gland
Facial artery and vein
Hyoid bone
External carotid artery
Internal jugular vein
Common trunk receiving facial, retromandibular and lingual veins
Sternocleidomastoid muscle
External jugular vein
Stylohyoid muscle
Digastric muscle (posterior belly)
Retromandibular vein
Parotid gland
F. Netter M.D.
© Novartis

Minor salivary glands

- **Either mucous serous or both**
- **600-1000 /person**
- **Each gland has it’s own duct**
- **Found most commonly in buccal, labial, palatal, and lingual regions**

Physiology

- **Role of saliva:**
  - Lubricates
  - Moistens, help with mastication
  - Cools hot food
  - Buffers chemicals
  - Cleans the mouth (lavage)
  - Protects mucosa
  - Prevent dental caries
  - Antibacterial (lysozyme, IgA, peroxidase)
  - Homeostasis

Salivary flow rates

- **~1000-1500 ml/24hrs, or 1 ml/min.**
- **Unstimulated 69% of flow from SM gland, 26% parotid, 5% SL.**
- **Stimulated parotid and SM .**
- **Minor glands independent of stimulation usually account for 7-8% total flow.**

Infections of the Salivary Glands

Viral Infections - Mumps

- **Most common nonsuppurative infection**
- **Children**
- **Parotid (occ. SMG)**
- **Bilateral, generalized swelling**
- **Paramyxovirus**
  - Highly contagious
  - Air-borne droplet spread
  - Incubation 18 days
  - Virus spread for 1 week following swelling

Mumps-Rx

- **Hydration**
- **Rest**
- **Modify diet to decrease gland stimulation**

Acquired Immunodeficiency Syndrome

- **HIV**
- **Lymphoproliferative and cystic enlargement of the major salivary glands**
- **High suppressor T-cells and lymphocytosis**
- **Can be initial presentation**
- **Parotid (15- 30% bilateral) with lymphocytic interstial pneumonitis**
- **HIV in saliva**

Acute Suppurative Sialoadentitis

- **“Surgical parotitis”, “Surgical mumps”**
- **Retrograde migration of bacteria from the oral cavity**
- **Parotid gland most frequently involved**
  - Inferior bacteriostatic properties

Pathogenesis of Acute infections

- **Stasis permits retrograde flow**
- **Compromised host resistance**
- **Poor oral hygiene (increase oral bacteria)**
- **Chronic disease or prolonged recovery**
- **DEHYDRATION**
- **Anticholinergics or diuretics**
- **Anorexia reduces salivation**
- **25% bilateral**

Symptoms of Acute infections

- **Rapid onset of pain, swelling, induration**
- **Fever, chills, malaise**
- **Increased WBC count**
- **Suppurative discharge from the gland**
- **S. aureus**

Treatment

- **Antibiotics**
- **Steroids**
- **Analgesics**
- **Local heat application**
- **Increased fluid intake**
- **Surgical treatment if no improvement**
- **CT or US to rule out abscess**
- **Sialogram C/I in acute phase**

Chronic Sialoadenitis

- Repeated episodes of pain and inflammation
- Parenchymal degeneration and fibrous replacement of the gland
- Initial severe acute infection
- Duct obstruction
- Depressed glandular secretion
- Parotid
- More infections = more damage to gland and duct

Pathophysiology and Treatment

- Obstruction of salivary flow
- Intraductal calculus
- Stricture
- Mucous plug
- Ductal papilla lesion
- Extrinsic compression

- No consistent Tx
- Tympanic neurectomy
- Duct ligation
- Gland excision

Sialolithiasis

- **Formation of hardened intraluminal deposits in the ductal system**
- **Common with chronic sialoadenitis**
- **Causes:**
  - Stagnation of saliva
  - Focus for formation from duct injury
  - Biologic factors (Calcium salts)

Location

- **80% Wharthon's duct**
- **19% Stenson's**
- **1% sublingual**
- **Why Wharthon's?**
  - Alkaline and viscous saliva
  - Increased Ca and Phos
  - Angulation of the duct at Mylohyoid
  - Vertical orientation at the distal segment

Symptoms and Management

- Colicky postprandial pain
- Swelling

- Plain films
- Sialography
- CT

- Like sialoadenitis

- Avoid vigorous probing

- Incise duct orifice

- Stenting

- Surgical excision

Salivary Gland Neoplasms

- **Diverse histopathology**
  - Determines Aggressiveness
- **<u>Relatively</u> uncommon**
  - 2% of head and neck neoplasms
- **Distribution**
  - 95% in adults
  - Parotid: 80% overall; 80% benign
  - Submandibular: 15% overall; 50% benign
  - Sublingual/Minor: 5% overall; 40% benign

Most Common Parotid Tumours

- **Benign**
  1) Pleomorphic adenoma
  2) Warthin tumour

- **Malignant**
  1) MEC
  2) AdenoCa

Most Common SMG , Minor Salivary Gland Tumours

- **Benign**
  1) Pleomorphic adenoma

- **Malignant**
  1) ACC
  2) MEC
  3) Malignant mixed

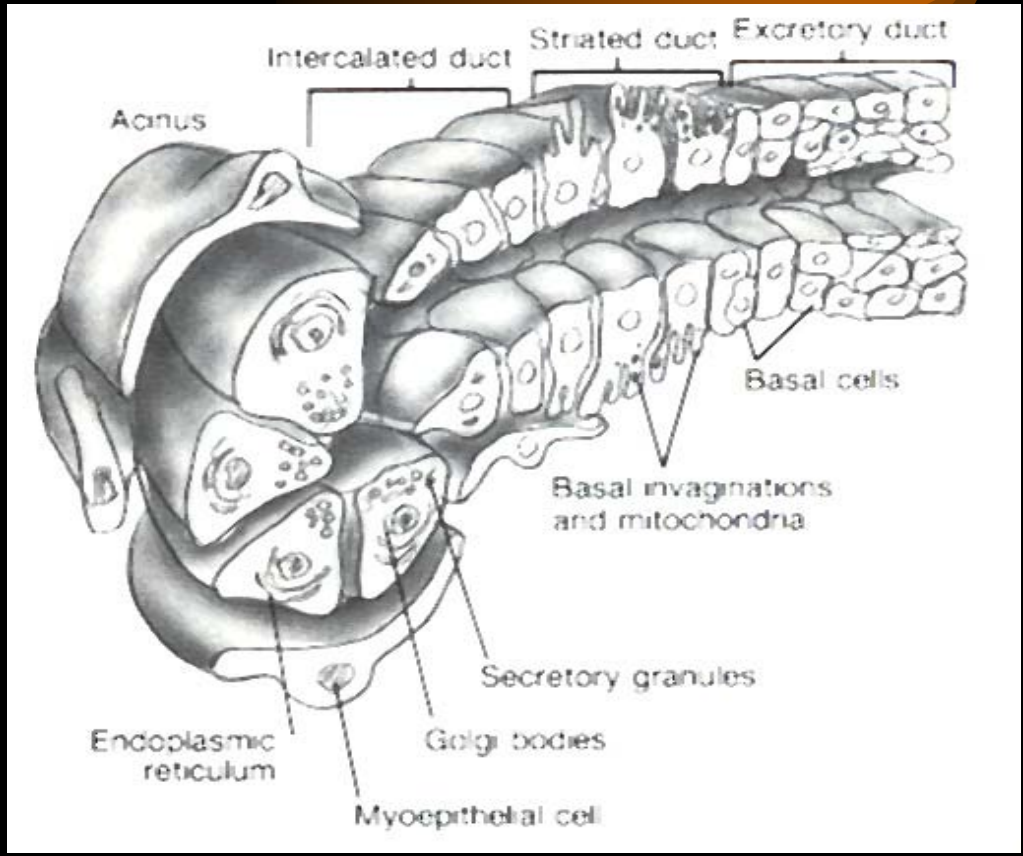
Common Salivary Gland Tumours in Children

- **Benign**
  1) Hemangioma (mesenchymal)
  2) Pleomorphic adenoma (epithelial)
  3) Lymphangioma
- **Malignant**
  1) 85% in parotid
  2) MEC
  3) Acinic cell carcinoma
  4) AdenoCa

Multicellular Theory

Neoplastic cells originate from secretory unit counterparts

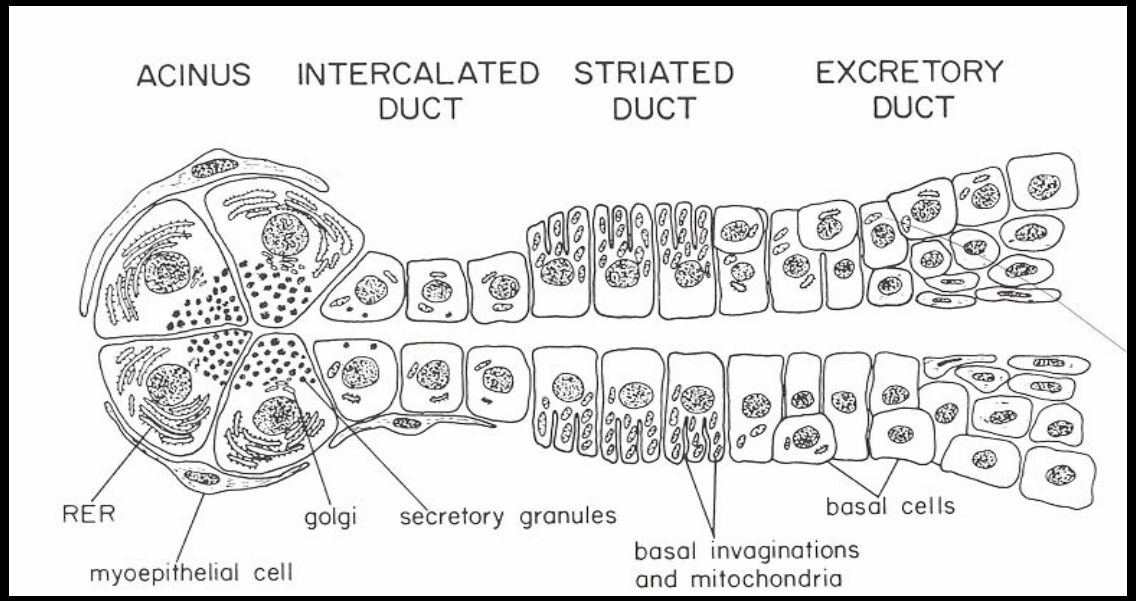
- **Striated duct—oncocytic tumors, Warthin's, adenoca**
- **Acinar cells—acinic cell carcinoma**
- **Excretory Duct—squamous cell and mucoepidermoid carcinoma**
- **Intercalated duct and myoepithelial cells—pleomorphic tumors, adenoid cystic & adenoca**



Bicellular Theory

Neoplastic cells originate from basal cells in intercalated and excretory ducts

- **Intercalated Ducts**
  - Pleomorphic adenoma
  - Warthin's tumor
  - Oncocytoma
  - Acinic cell
  - Adenoid cystic
- **Excretory Ducts**
  - Squamous cell
  - Mucoepidermoid



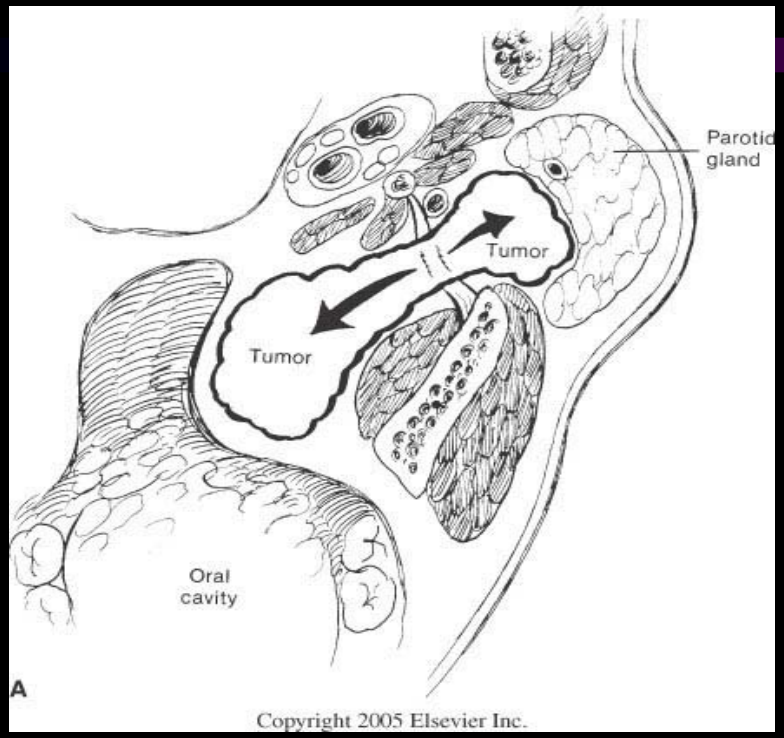
Benign Neoplasms

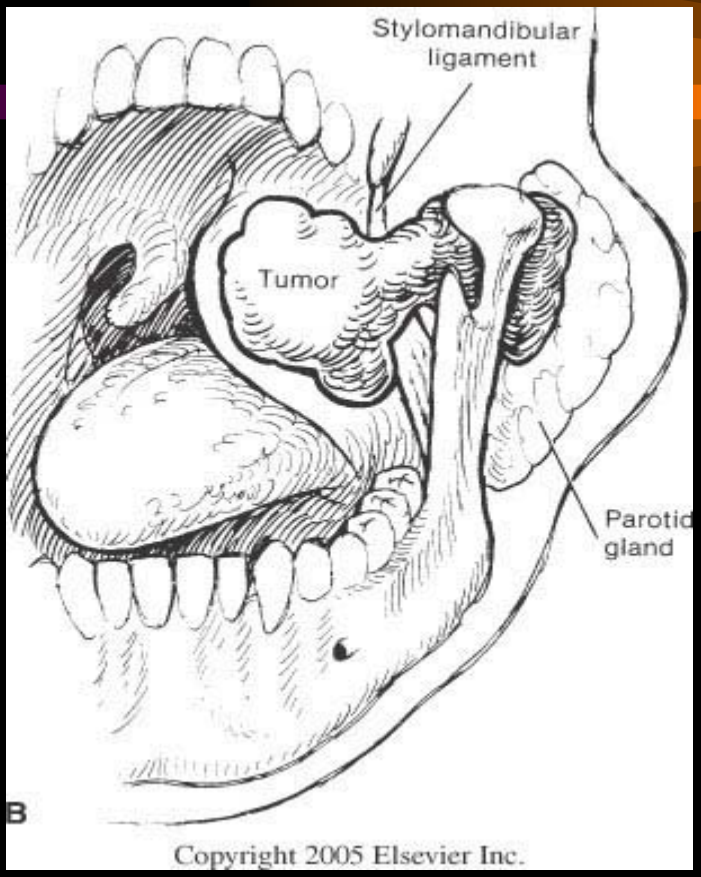
Pleomorphic Adenoma

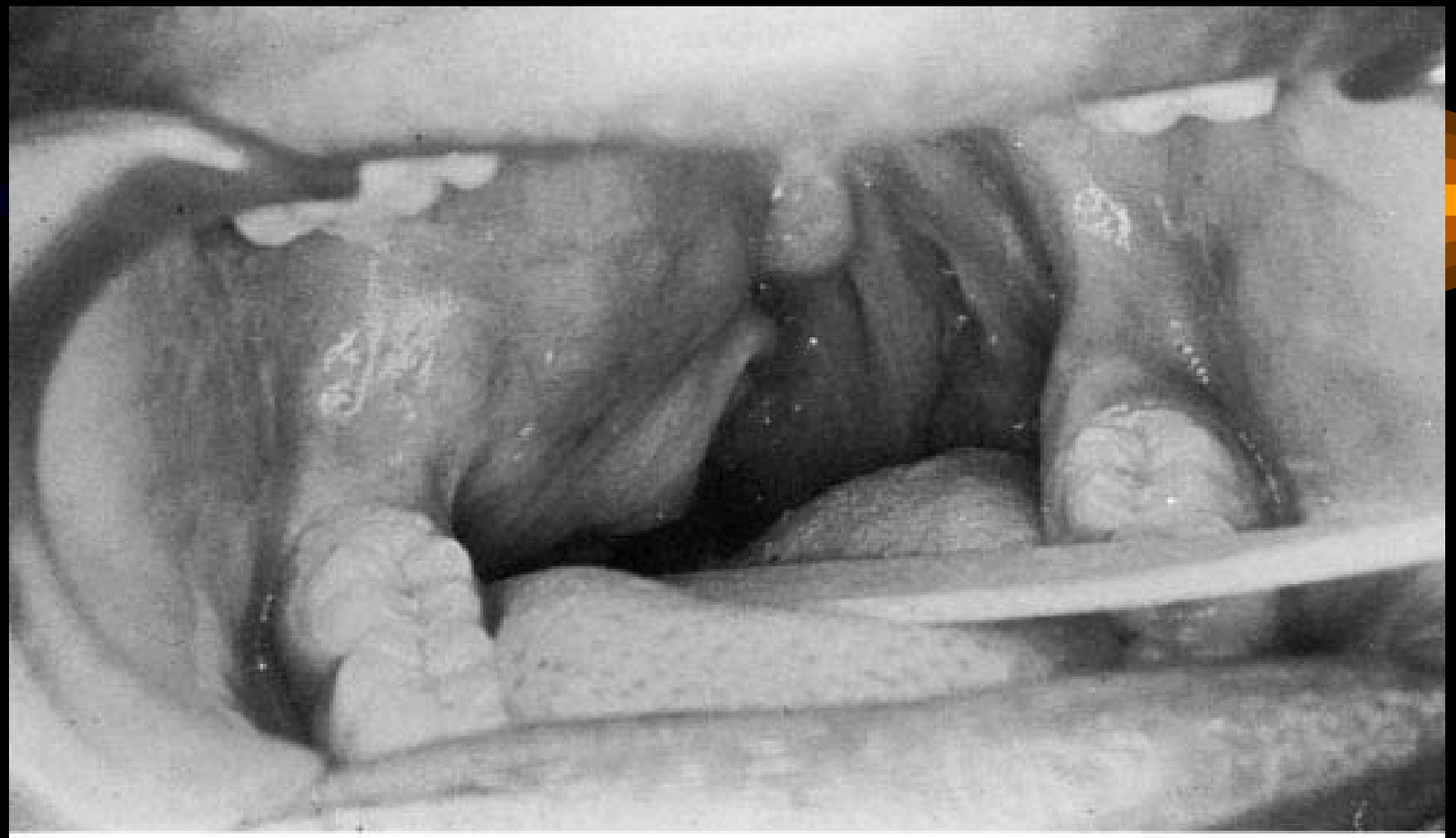
- **Most common of all salivary gland neoplasms**
  - 70% of parotid tumors
  - 50% of submandibular tumors
  - 45% of minor salivary gland tumors
  - 6% of sublingual tumors
- **4^{th}-6^{th} decades**
- **F:M = 3-4:1**

Pleomorphic Adenoma

- **Slow-growing, painless mass**
- **Parotid: 90% in superficial lobe, most in tail of gland**
- **Minor salivary gland: lateral palate, submucosal mass**







Pleomorphic Adenoma

- **Treatment: complete surgical excision**
  - Parotidectomy with facial nerve preservation
  - Submandibular gland excision
  - Wide local excision of minor salivary gland
- **Avoid enucleation and tumor spill**
  - 20-45% recurrence
- **Can metastasize and yet remain benign histologically**

Warthin's Tumor

- **Papillary Cystadenoma Lymphomatosum**
- **6-10% of parotid neoplasms**
- **Older, males**
- **10% bilateral; 20% multicentric**
- **3% with associated neoplasms**
- **Presentation: slow-growing, painless mass in parotid tail**
- **RX:Surgery**

Malignant Tumors

Mucoepidermoid Carcinoma

- **Most common salivary gland malignancy**
- **5-9% of salivary neoplasms**
- **Parotid 45-70% of cases**
- **Palate 18%**
- **3^{rd}-8^{th} decades, peak in 5^{th} decade**
- **F>M**

Mucoepidermoid Carcinoma

- **Presentation**
  - Low-grade: slow growing, painless mass
  - High-grade: rapidly enlarging, +/- pain
  - **Minor salivary glands: may be mistaken for benign or inflammatory process

Mucoepidermoid Carcinoma

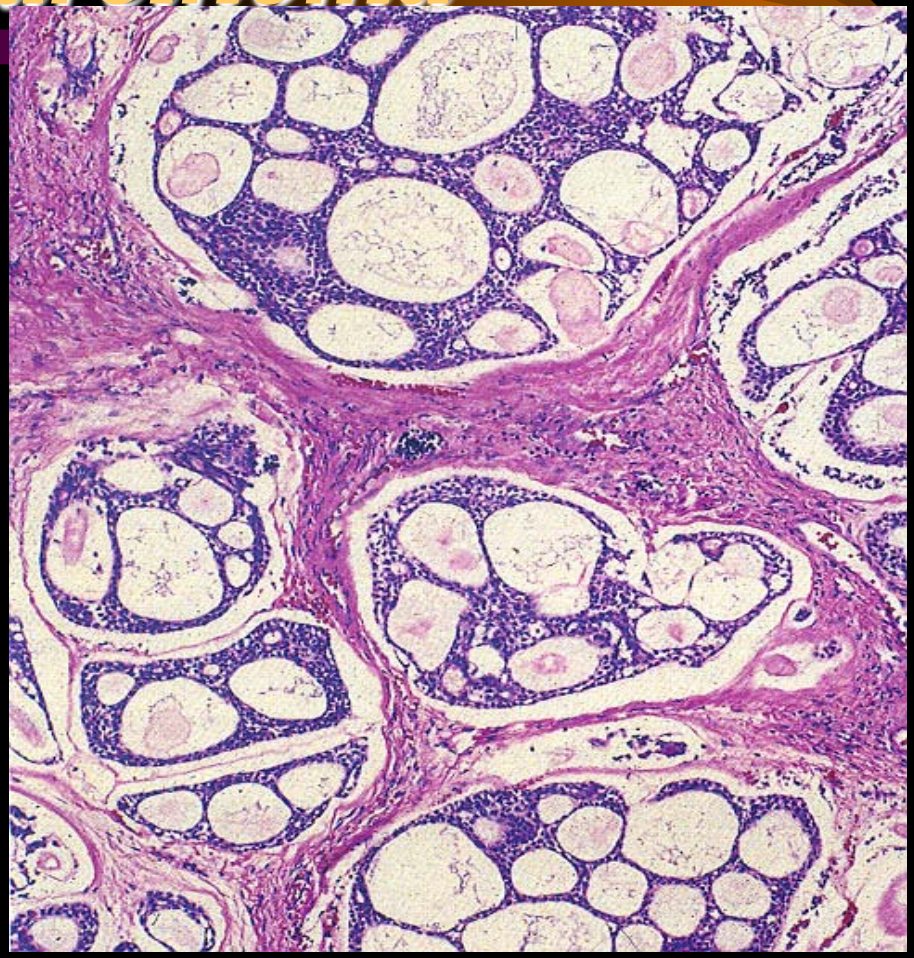
- **Treatment**
  - Influenced by site, stage, grade
  - Low-grade tumors: complete resection by parotidectomy
  - High-grade: parotidectomy, neck dissection (N0 neck) & Radiotherapy

Adenoid Cystic Carcinoma

- **Overall, 2nd most common salivary gland malignancy**
- **2nd most common of parotid**
- **Most common in submandibular, sublingual and minor salivary glands**
- **M = F**
- **5th decade**
- **Presentation**
  - Asymptomatic enlarging mass
  - Pain, paresthesias, facial weakness/paralysis

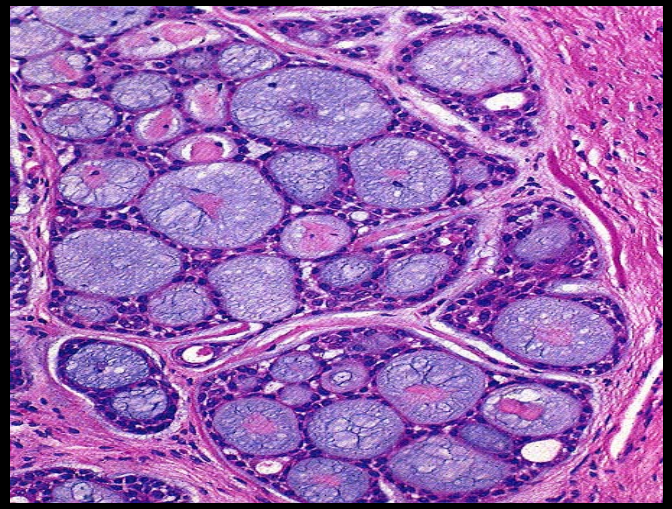
Adenoid Cystic Carcinoma

- **Histology**
- **i) cribriform pattern**
  - Most common
  - “swiss cheese” appearance

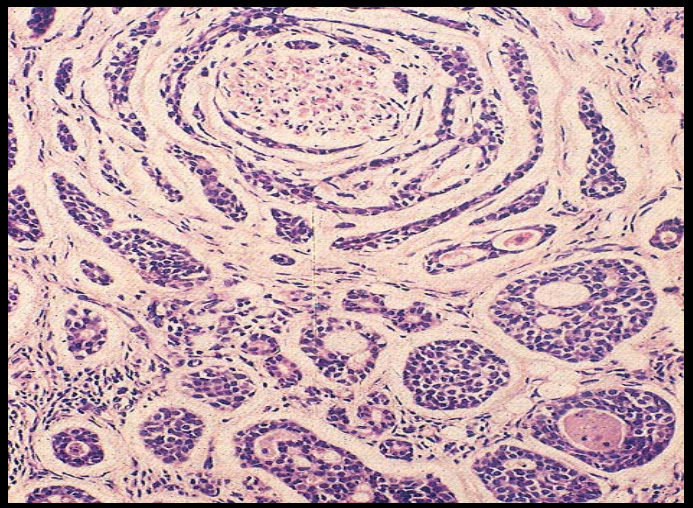


Adenoid Cystic Carcinoma

- **ii) tubular pattern**
  - Layered cells forming duct-like structures
  - Basophilic mucinous substance



- **iii) solid pattern**
  - Solid nests of cells without cystic or tubular spaces



Adenoid Cystic Carcinoma

- **Treatment**
  - Complete local excision
  - Tendency for perineural invasion: facial nerve sacrifice
  - Postoperative *Neutron Beam* XRT


Complications

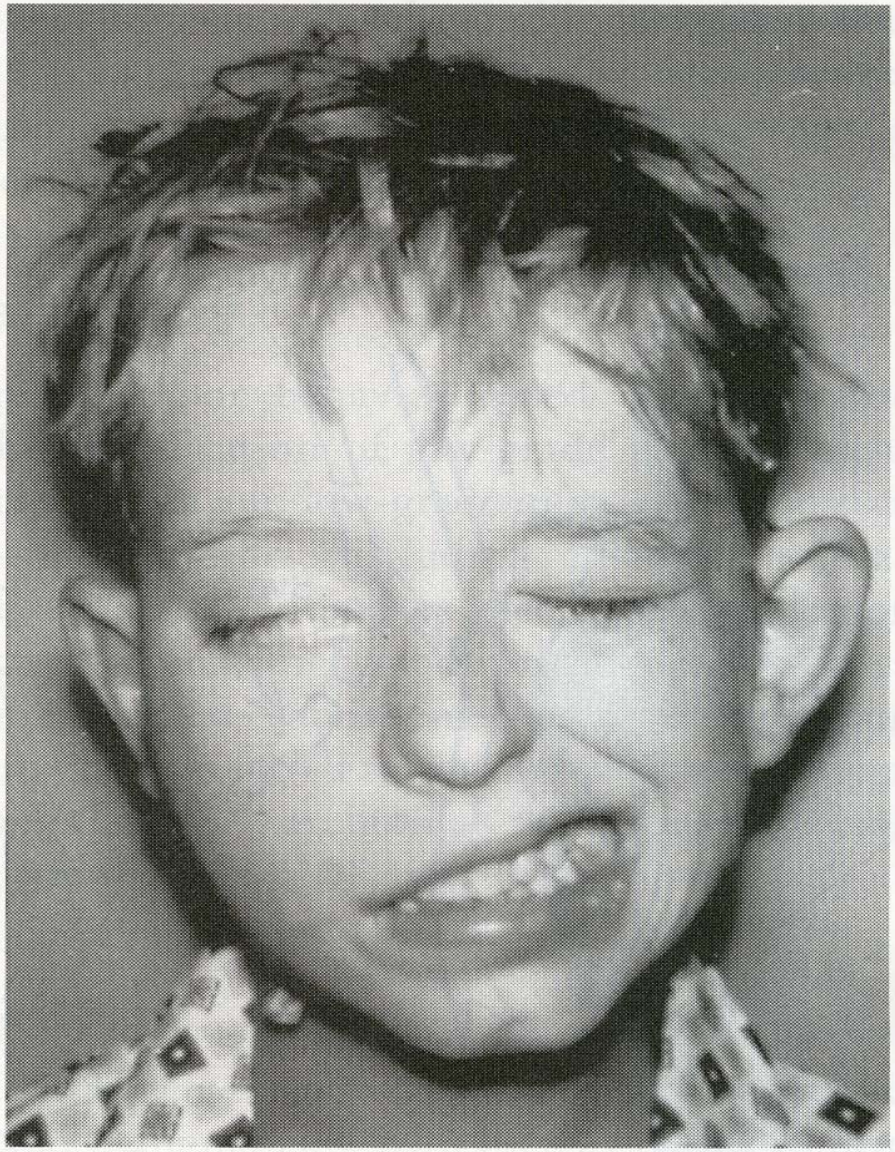


FIGURE 107.17. Right facial paralysis after parotidectomy.

Frey's syndrome (Gustatory sweating)

- *Aberrant reinnervation of postganglionic parasympathetic nerves to the sweat glands of the face*
- 10% of patients overtly symptomatic
- Diagnosis: Minor's starch iodine test

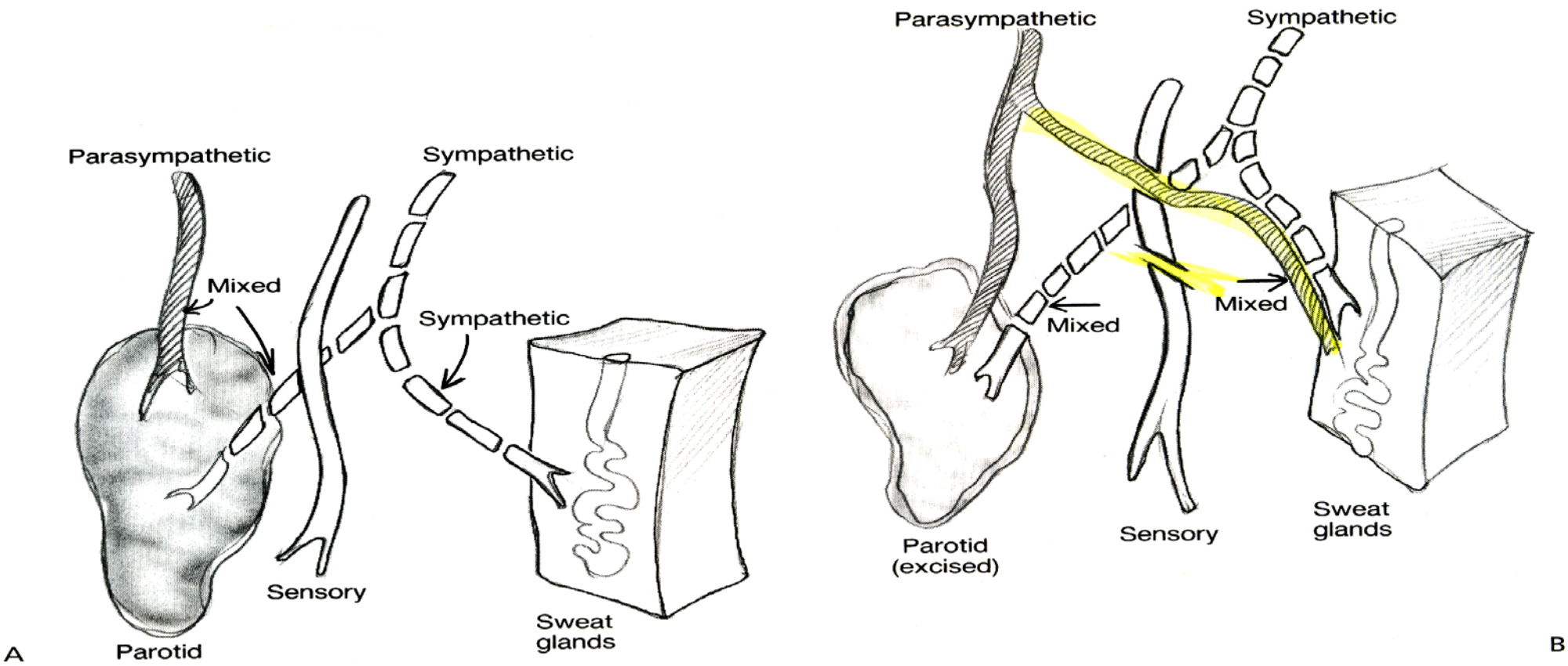


FIGURE 107.18. A: Normal innervation of parotid and sweat glands. **B:** Proposed mechanism of gustatory sweating (Frey's syndrome).

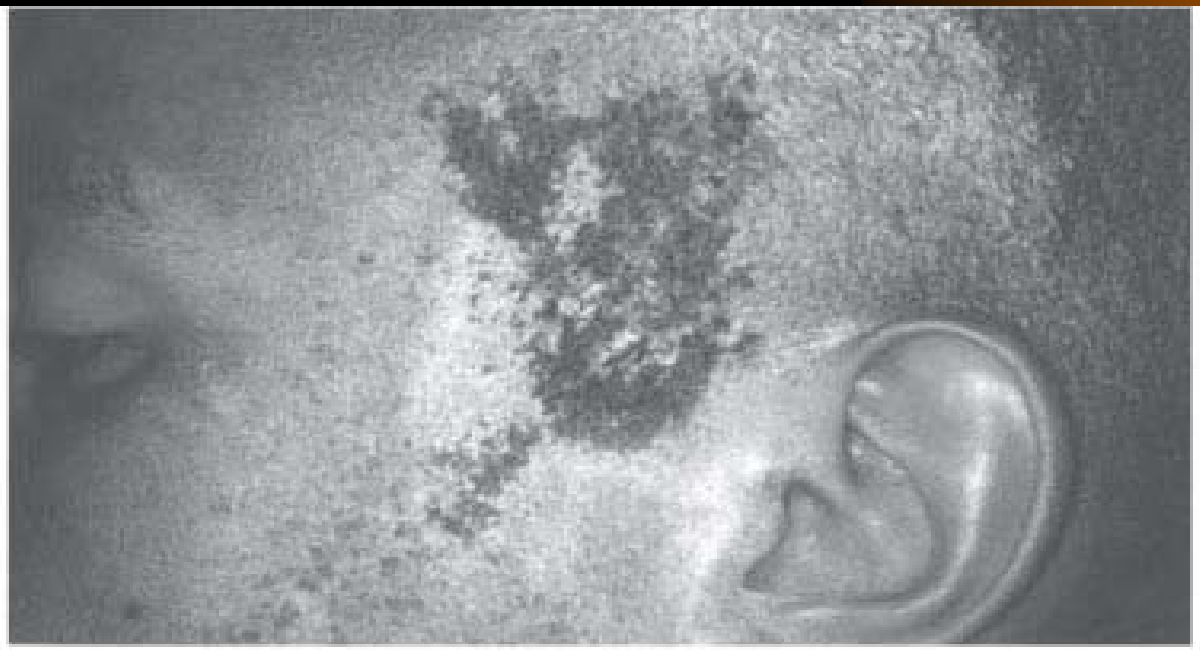


Figure 3. The Minor's test showed areas where the secretion of sweat gland diluted with iodine, which reacted with the starch.

BOX 61-13

TREATMENT OF GUSTATORY SWEATING

Nonsurgical
- Topical glycopyrrolate
- Topical antiperspirant

Botox injection

Surgical
- Fat grafting
- Dermal grafting
- Temporalis fascia interposition flap
- Sternocleidomastoid interposition flap
- Tympanic neurectomy

Head & Neck Tumours
Part III

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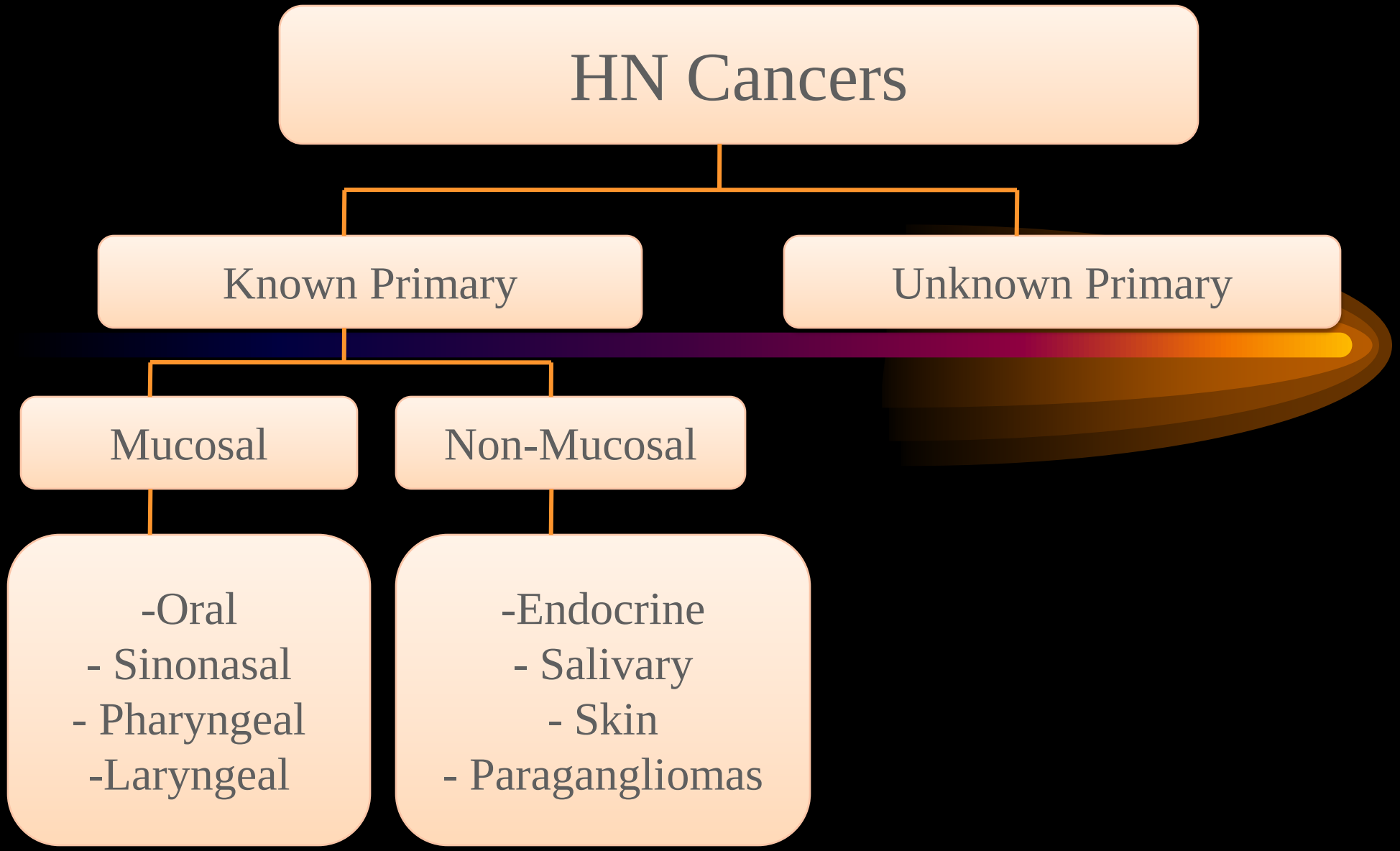

HN Cancers
Known Primary
Unknown Primary
Mucosal
Non-Mucosal
-Oral
- Sinonasal
- Pharyngeal
-Laryngeal
-Endocrine
- Salivary
- Skin
- Paragangliomas

HN Mucosal Cancers

	DDX	Risk Factors	Presentation	RX
Sinonasal				
Oral				
Pharynx				
Larynx				

Content

- **Tumours of the Mouth**
- **Tumours of the Pharynx**
- **Tumours of the Larynx**

Oral Cavity Cancer

- **Introduction**
- **Premalignant Lesions**
- **Malignant Lesions**

Premalignant Lesions

- **Leukoplakia**
  - Hyperkeratosis, dysplasia
  - Malignant transformation greater in non-smokers
  - Treatment:
    - Surgical or laser excision
    - Topical bleomycin, retinoids

- **Erythroplasia**
  - Greater risk of malignancy

Epidemiology

- **95% are squamous cell carcinoma**

- **Risk factors**
  - Smoking (depends on dosage and type)
  - Alcohol
  - Tobacco chewing
  - HPV (subtype 16)
  - ?Poor dentition / mechanical irritation (dentures)

Differential Diagnosis

- **Granular cell myoblastoma**
- **Minor salivary gland neoplasm**
  - Adenoid cystic, mucoepidermoid, adeno-ca.
- **Sarcomas (rhabdo, lipo, MFH, leiomyo)**
- **Hodgkin and NH lymphoma**
- **Malignant melanoma**
- **Hairy leukoplakia, Kaposi sarcoma**
  - HIV, immunocompromised

Treatment

- **Team approach**
  - Surgeons and Radiation Oncologists
  - SLP
  - Oral Surgeon
- **T1 and T2 – surgery or radiation**
- **T3 and T4 – combined modality**

Tumours of Pharynx

- **Nasopharyngeal Carcinoma**
- **Oropharyngeal Carcinoma**
- **Hypopharyngeal Carcinoma**

Nasopharyngeal Carcinoma Introduction

- **Rare in the US, more common in Asia**
- **High index of suspicion required for early diagnosis**
- **Nasopharyngeal malignancies**
  - SCCA (“nasopharyngeal carcinoma”)
  - Lymphoma
  - Salivary gland tumors
  - Sarcomas

Classification

- **WHO classes**
  - Based on light microscopy findings
  - All SCCA by EM

- **Type I - “SCCA”**
  - 25 % of NPC (in North Amer population)
  - 1-2 % NPC of endemic populations
  - moderate to well differentiated cells similar to other SCCA (keratin, intercellular bridges)

Classification

- **Type II - “non-keratinizing” carcinoma**
  - 12 % of NPC
  - variable differentiation of cells (mature to anaplastic)
  - minimal if any keratin production

Classification

- **Type III - “undifferentiated” carcinoma**
  - 60 % of NPC in North Amer population, majority of NPC in young patients, and 95% of endemic cases
  - Difficult to differentiate from lymphoma by light microscopy requiring special stains & markers

Epidemiology

- **Chinese native (esp Guangdong province) > Chinese immigrant > North American caucasian**
  - Both genetic and environmental factors

- **Genetic**
  - HLA histocompatibility loci possible markers
    - HLA-A2, B17 and Bw46

Epidemiology

- **Environmental**
  - Viruses
    - EBV- well documented viral “fingerprints” in tumor cells and also anti-EBV serologies with WHO type II and III NPC
    - HPV - possible factor in WHO type I lesions
  - Nitrosamines - salted fish
  - Others - polycyclic hydrocarbons, chronic nasal infection, poor hygiene, poor ventilation

Clinical Presentation

- **Often subtle initial symptoms**
  - unilateral HL (SOM)
  - painless, slowly enlarging neck mass (70%)
    - Lymphatic channels cross midline in NP, bilateral disease common
- **Larger lesions**
  - nasal obstruction
  - epistaxis
  - cranial nerve involvement

Treatment

- **External beam radiation**
- **Adjuvant Chemotherapy**

Oropharyngeal Cancer Introduction

- **Relatively uncommon**
- **6^{th} and 7^{th} decades mainly**
- **Male predominance**
- **SCC = 90%**
- **Tobacco and alcohol**
- **Complex, multimodal treatment**
- **Team approach**

Anatomy

- **Pharyngeal walls**
- **Tonsils sit in tonsillar fossa**
- **Soft Palate**
- **Base of Tongue**

Etiology

- **SCC arise from the accumulation of multiple genetic alterations to genes important to the regulation of cell growth and death**
- **Cells have selective growth advantage**
  - Genetic
  - Environmental
    - Tobacco and alcohol
    - Dose related
    - Synergistic
  - HPV and EBV
  - Dietary factors
  - Immunosuppression

Histopathology

- **Premalignant lesions**
  - Leukoplakia
  - Erythroplakia

- **SCC and variants >90%**

Treatment

- **Team approach**
  - Surgeons and Radiation Oncologists
  - SLP
  - Oral Surgeon
- **T1 and T2 – surgery or radiation**
- **T3 and T4 – combined modality**

Hypopharyngeal Cancer

- **Incidence – 5-10% of all upper aerodigestive cancers (0.5% of all malignancies)**

- **M>F: males have 8X increased risk**

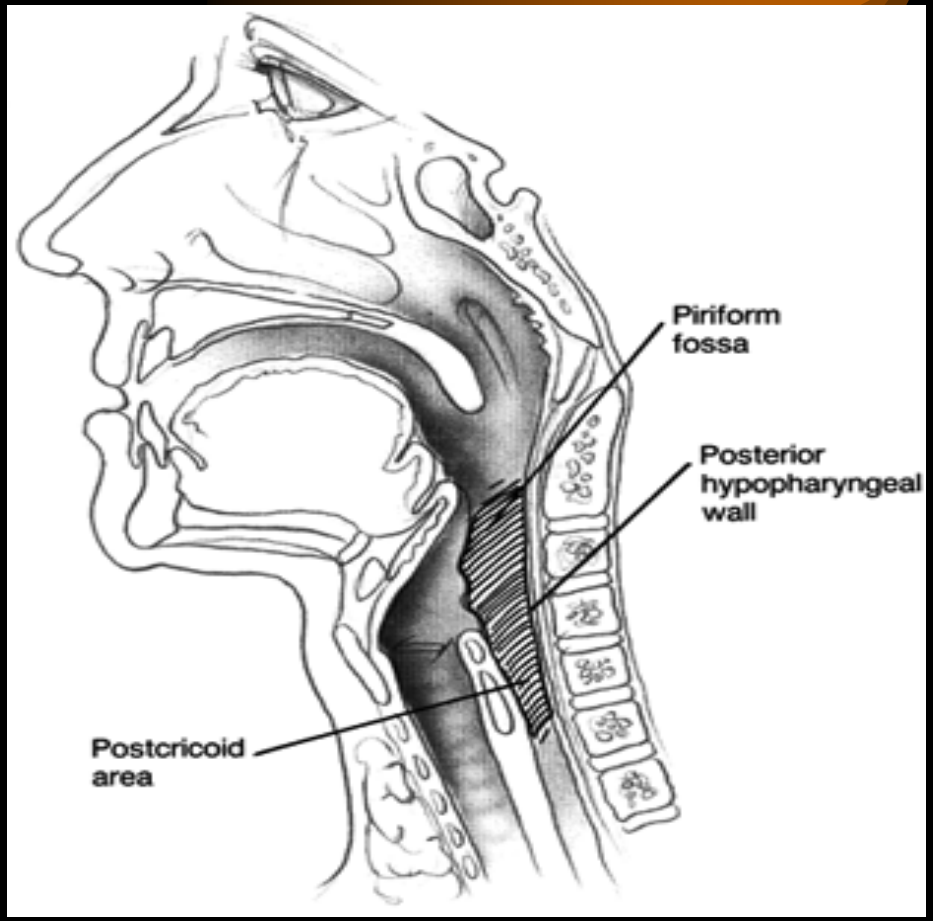
Hypopharyngeal Cancers

- **Risk Factors**
  - Smoking
  - EtOH
  - Chronic reflux disease

- **Treatment Challenge:**
  - Patients often present with advanced disease
  - May be complicated by severe malnutrition

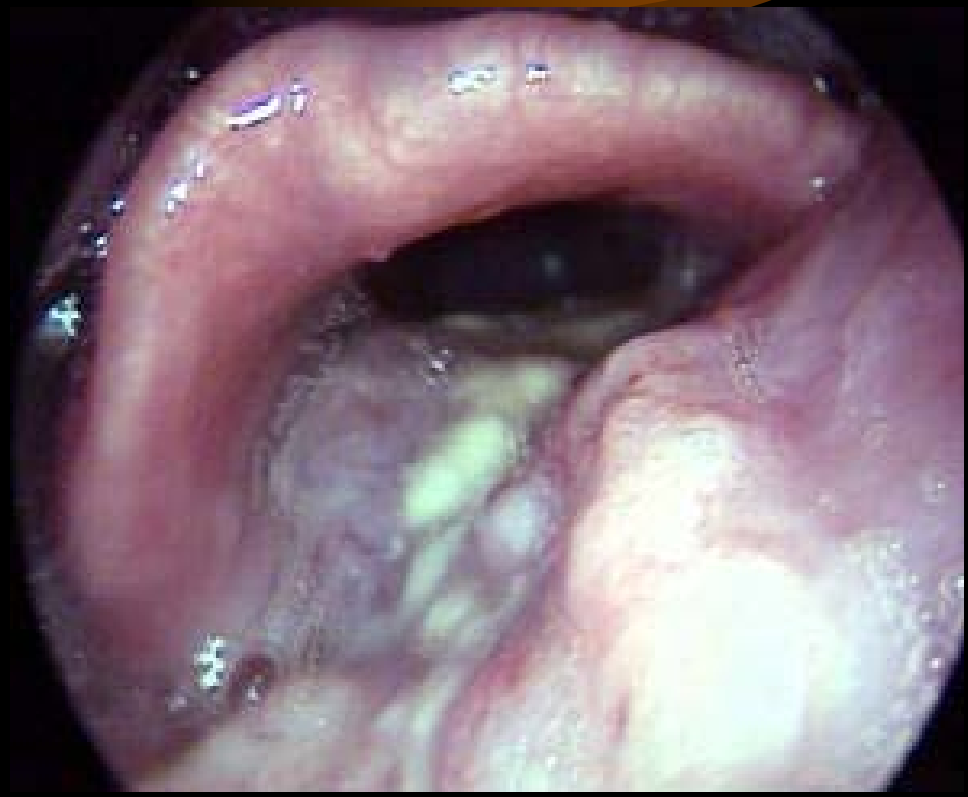
Hypopharynx - Anatomy

- **Abuts the oropharynx at the level of the hyoid, extends to the level of the inferior border of the cricoid**
- **3 sub-sites: piriform fossa(e), post-cricoid region, posterior pharyngeal wall**



Staging Endoscopy

- **Most important component of procedure (secondary to obtaining Bx samples for diagnosis) is determining the inferior limit of the tumour**
- **Common site: piriform fossae, post pharyngeal wall, post-cricoid region**



Pathology

- **~95% of cancers of the hypopharynx are SCC**
- **Lymphomas**
  - Angiocentric T-cell lymphoma
  - MALT (mucosa associated lymphoid tissue)
  - Non-hodgkins lymphoma
- **Adenocarcinomas**
  - May originate in the minor salivary glands of the hypopharynx

Surgical Tx Options

- **Based on Site of Involvement**
  - Piriform Fossa (64%)
  - Posterior Pharyngeal Wall (30%)
  - Post-cricoid (4%)
- **Team approach**
  - Surgeons and Radiation Oncologists
  - SLP
  - Oral Surgeon
- **T1 and T2 – surgery or radiation**
- **T3 and T4 – combined modality**

Laryngeal Tumours

- **Introduction**
- **Benign Lesions**
- **Malignant Lesions**

Epidemiology

- **11 600 new cases laryngeal cancer per year in USA**
- **~1% of all cancers (excluding skin)**
- **79% occur in ♂**
- **>90% are squamous cell carcinomas (SCC)**

Etiology

- **EtOH – supraglottic**
- **Tobacco – glottic**
- **GERD – chronic laryngeal irritation**
- **Viral infection**
- **Radiation**

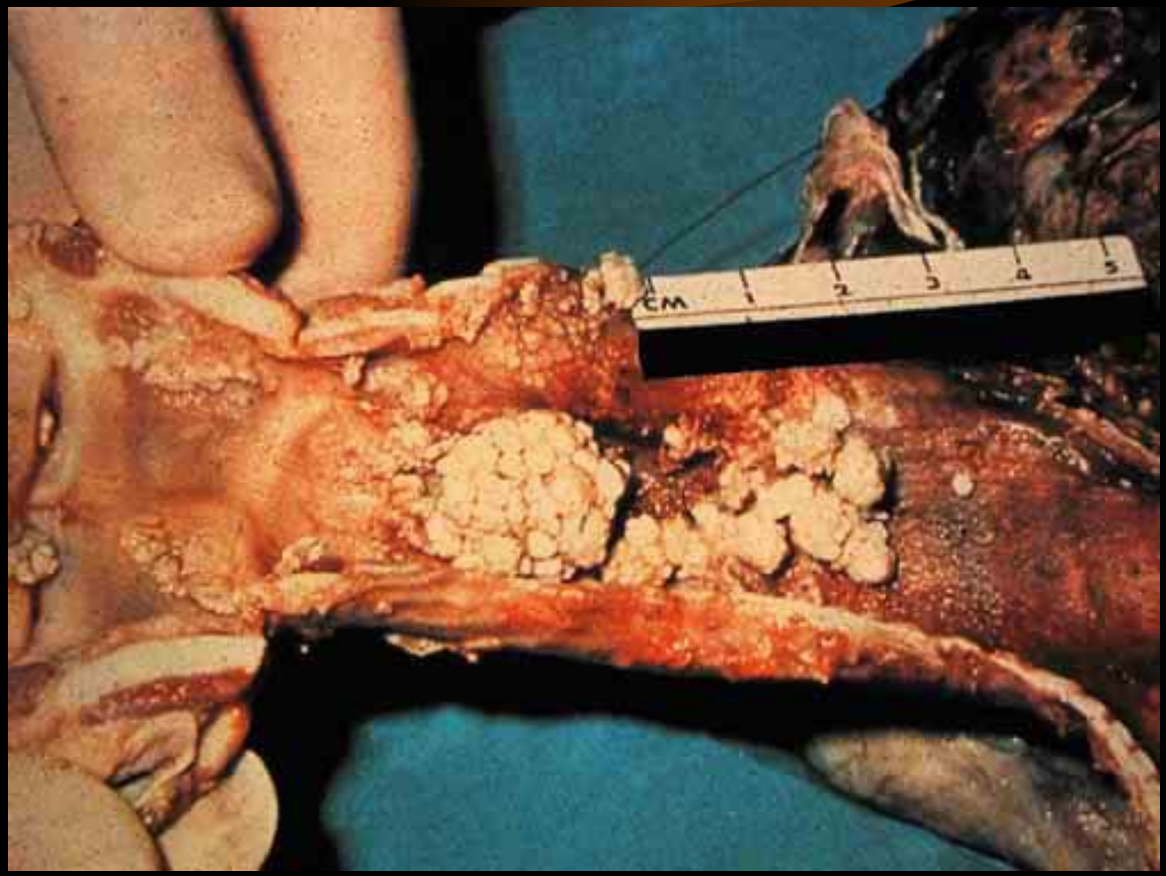
Laryngeal Papillomatosis

- **Most common benign laryngeal tumor, HPV etiology**
- **Vocal folds and subglottis most common laryngeal sites**

Laryngeal Papillomatosis

- **More prevalent in children, less common in individuals over 30 years of age**
  - HPV is transmitted to child through birth canal from cervix
  - Risk of transmission 1:400
- **Papillomas appear multinodular, and may be either sessile or exophytic**
  - May resemble carcinoma-in-site or even invasive SCC

Exophytic, warty, friable, tan-white to red growths



Laryngeal Papillomatosis

- **Most common viral subtypes are 6 or 11, but 16 or 18 have higher potential for malignant change**

- **Hoarseness is common early symptom followed by airway obstruction and respiratory difficulty**

Laryngeal Papillomatosis

- **Laryngeal papillomas presenting in adults seem to be less aggressive than juvenile form but remission rate unpredictable**
  - In adults, growth may be rapid during periods of hormone change such as during pregnancy
- **Malignant degeneration of laryngeal papillomas rare and usually associated with history of radiotherapy, tobacco abuse or both**

Treatment

- Surgery
  - Laser microlaryngoscopy (most commonly CO_2 [10.6um] or Nd:YAG [1.06um]) at power setting of 2-8W pulse or continuous
  - Powered microdebrider
  - Always biopsy before remainder of case proceeds

Cont Treatment

- Interferon
  - Bad chronic side-effects (myalgias, flu-like symptoms)
  - Lesions tend to return after interferon finished
- Intralesional cidofovir (acyclic nucleoside analogue)
- Indole-3-carbinol (found in cruciferous vegetables, works via inhibition of estrogen metabolism)
- Acyclovir
- Photodynamic therapy

Anatomy - Glottis

- **True vocal cords**
- **Anterior and posterior commissures**
- **Superior limit – apex of ventricle**
- **Inferior limit – 1 cm inferior to line through apex**

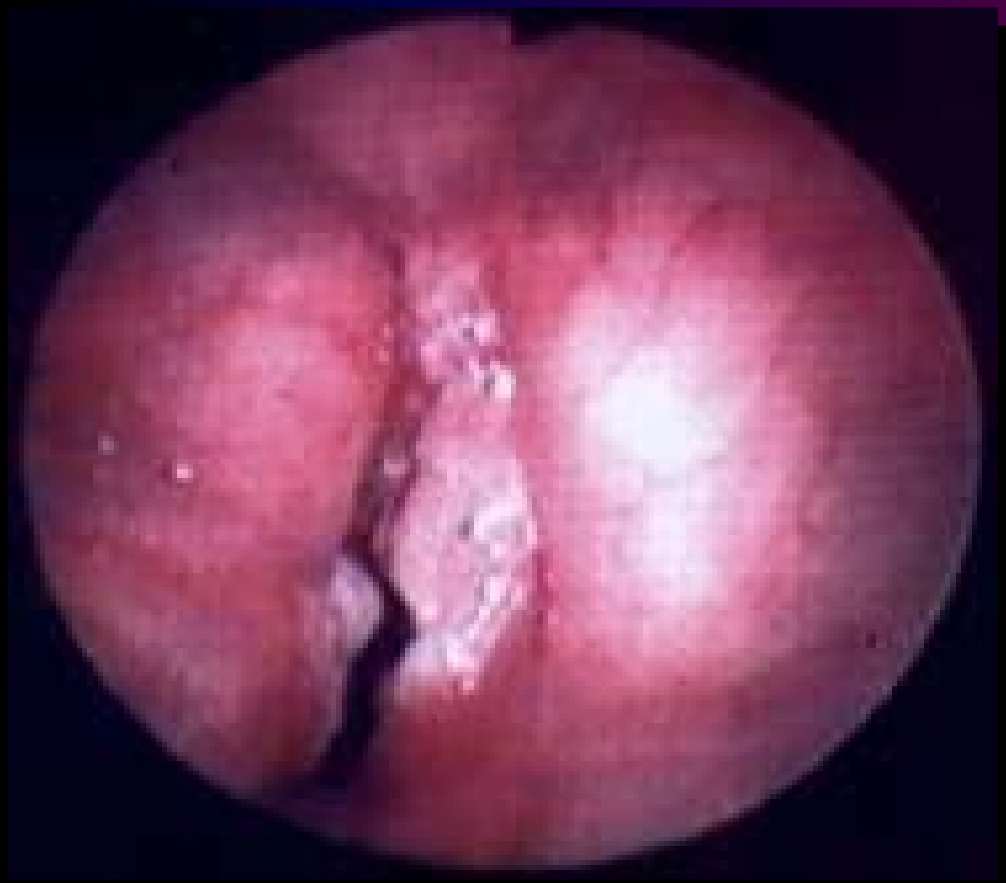
Symptoms

- **Hoarseness >4 weeks – investigate**
- **Occasionally may present without hoarseness**
- **Dysphagia**
- **Hemoptysis**

Glottic Carcinoma

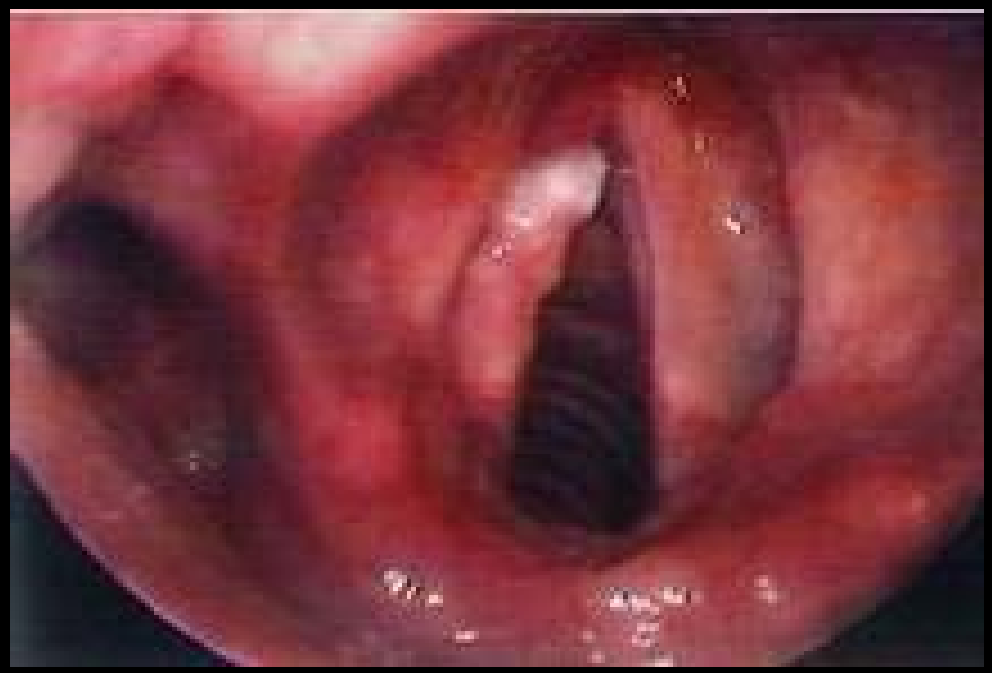
- **Early: irregular area of mucosal thickening**
- **Advanced: exophytic, fungating, endophytic, ulcerated mass**
- **More commonly keratinizing, well to moderately differentiated**
- **In situ component**
- **Invasive component predominantly infiltrative**

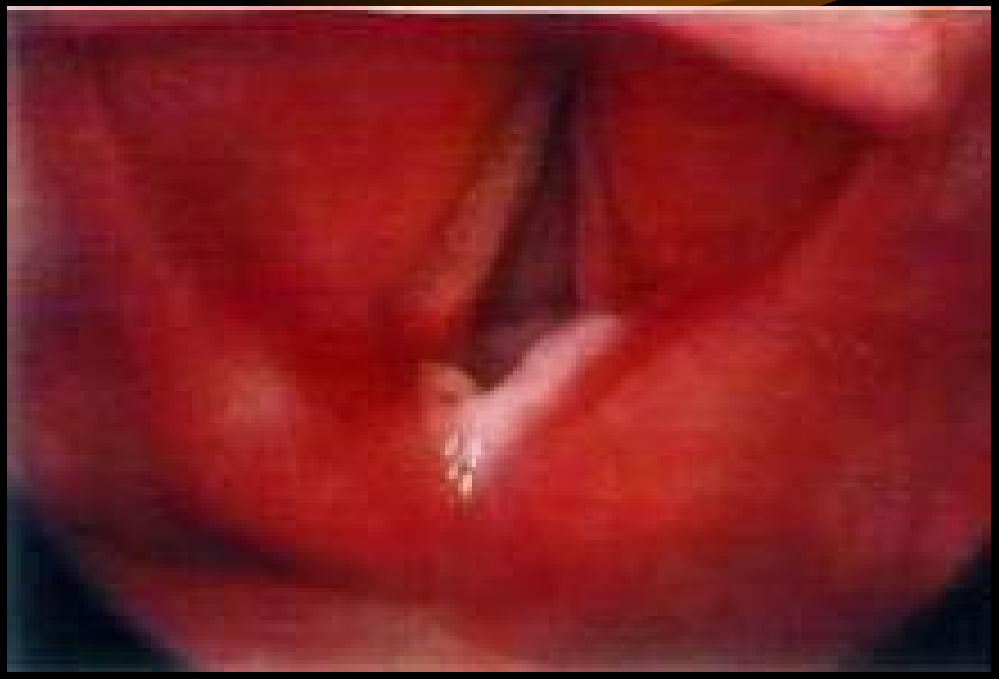
Glottic Carcinoma



- **Most tumors originate on free surface of vocal cord**
- **Anterior 2/3**

Glottic Carcinoma





Treatment

- **Early Stage:**

  Laser or Radiation

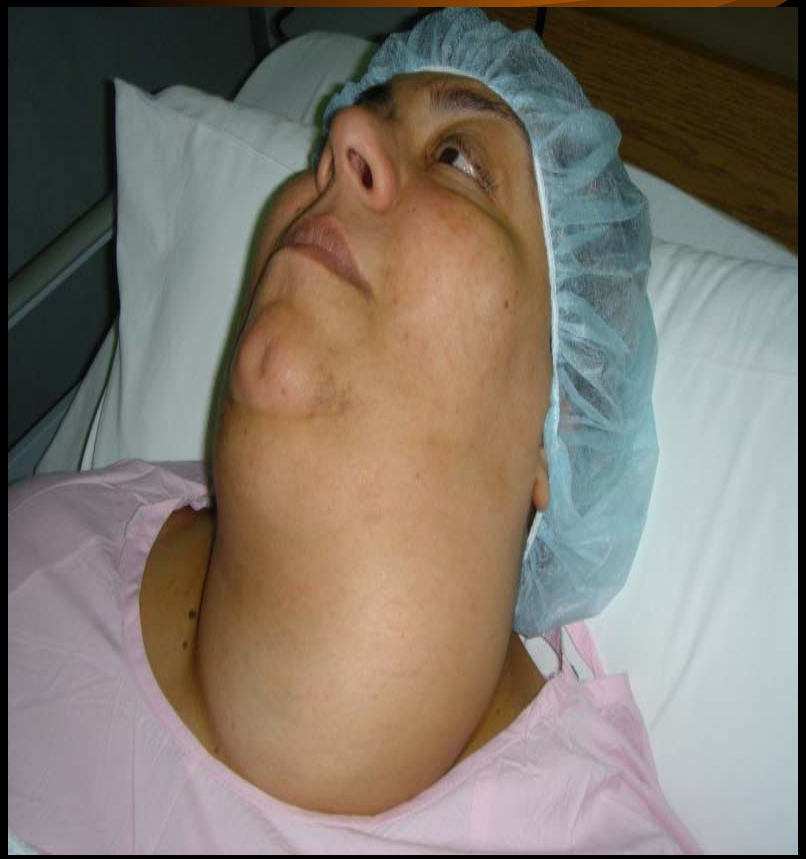
- **Advance Stage:**

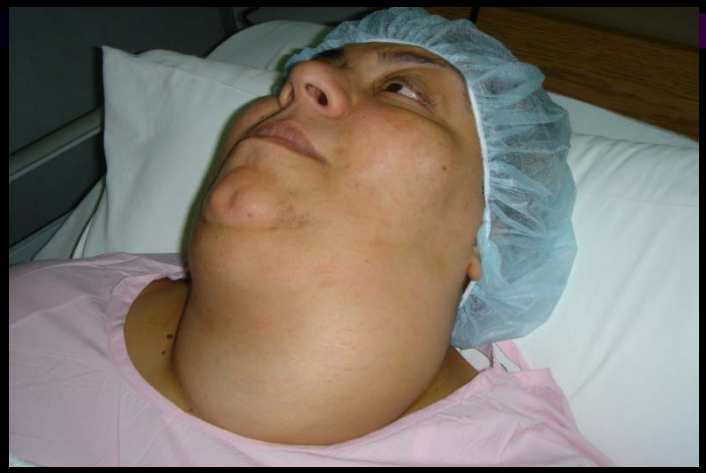
  Chemo+Radiation

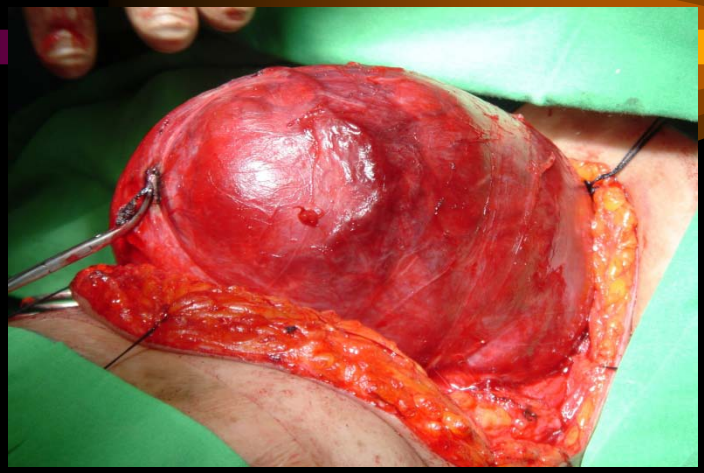
  Surgery+Radiation

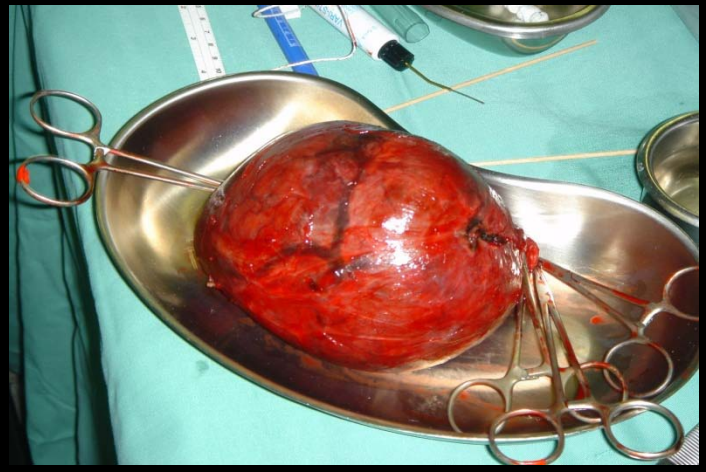
Case 1

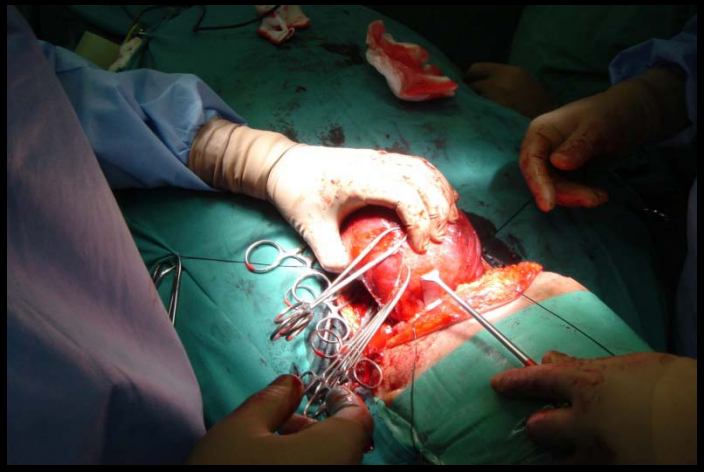
- **What is abnormal?**
- **What is your DDx?**
- **What is the most likely Dx?**
- **Work up**
- **Management**





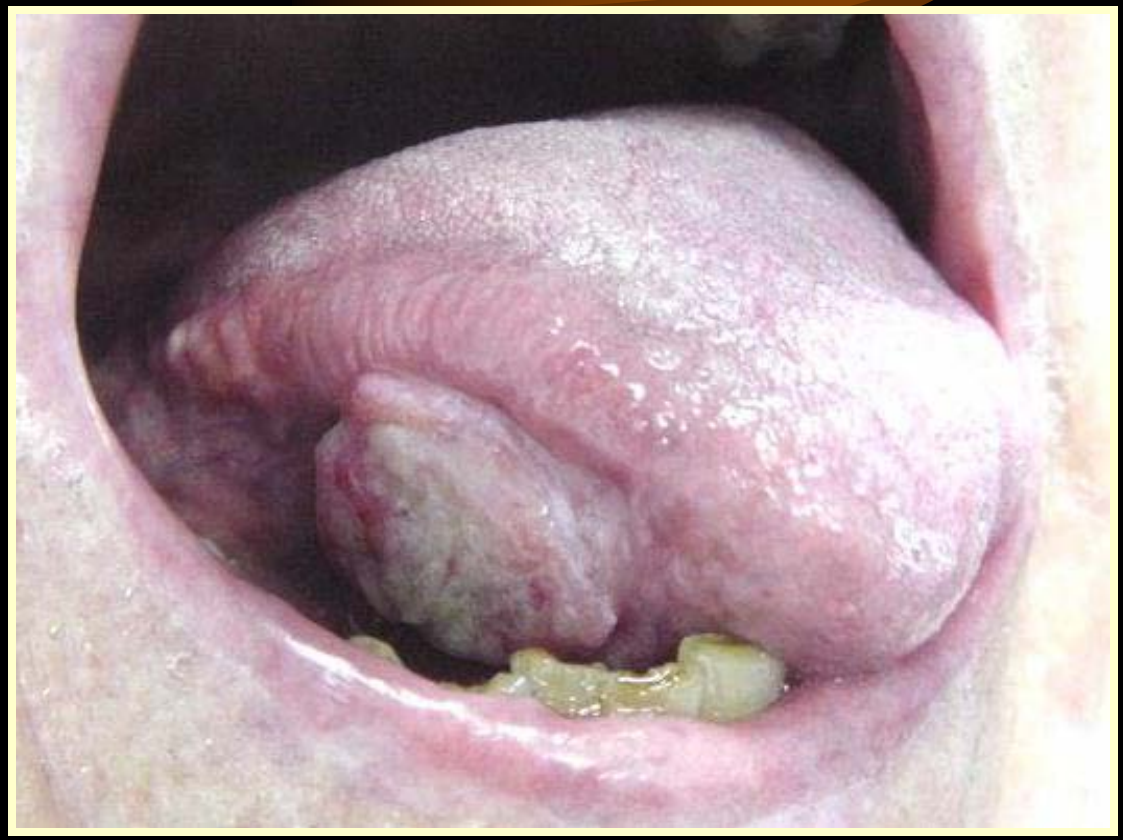






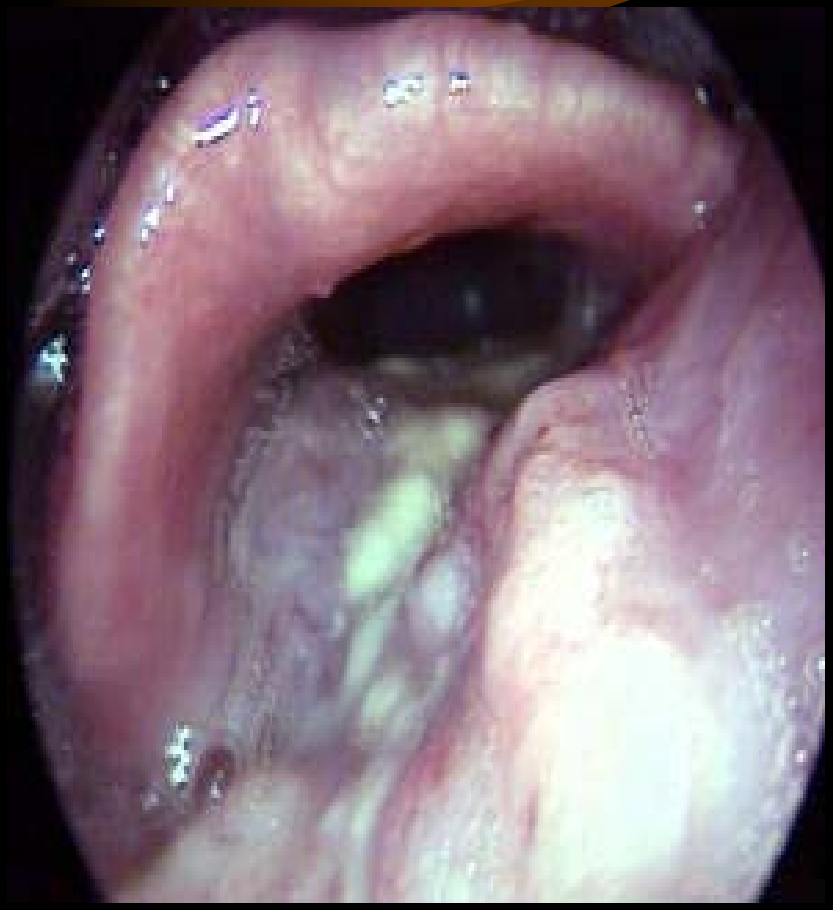
Case 2

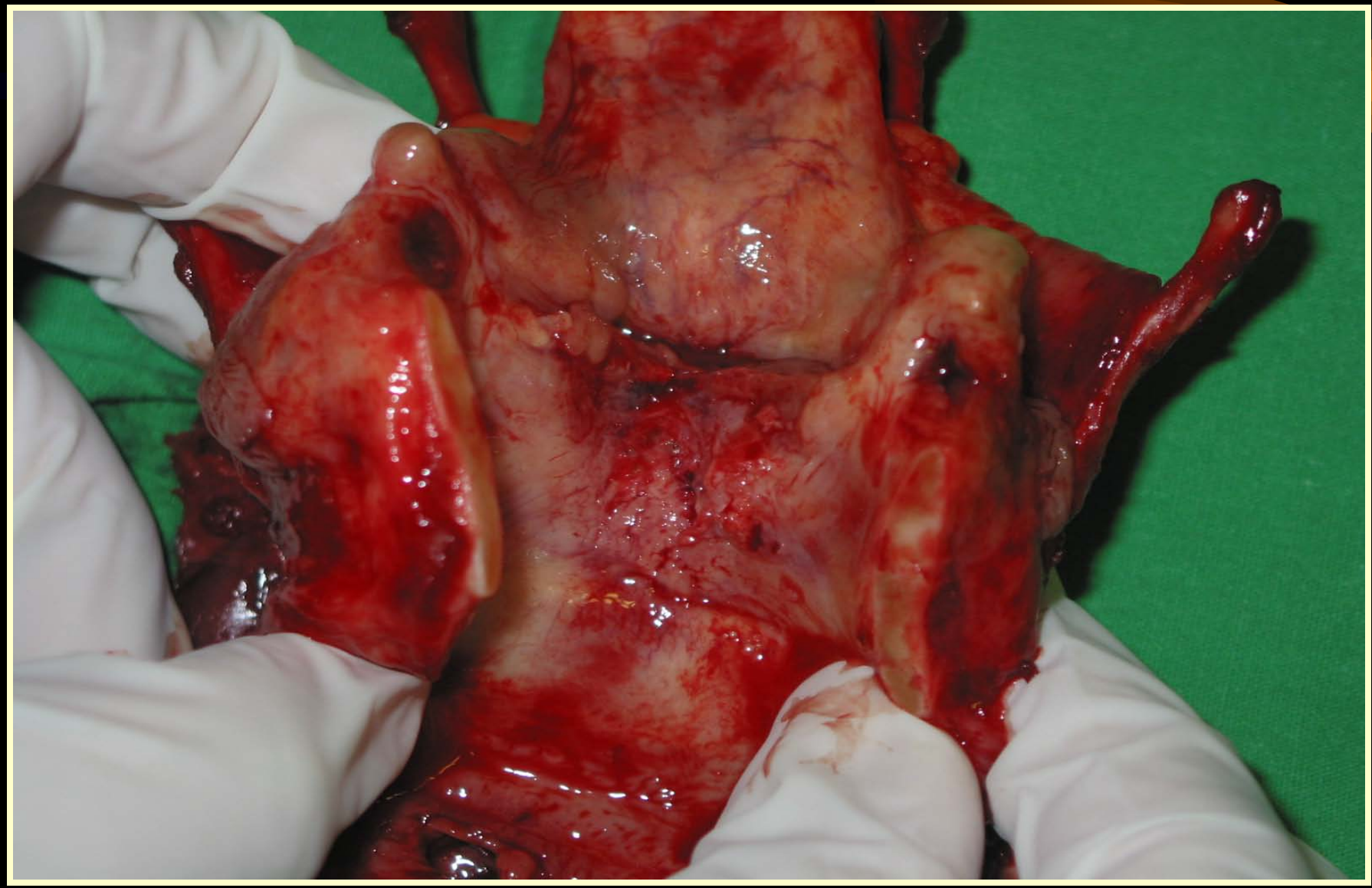
- What is abnormal?
- What is your DDx?
- What is the most likely Dx?
- Work up
- Management



Case 3

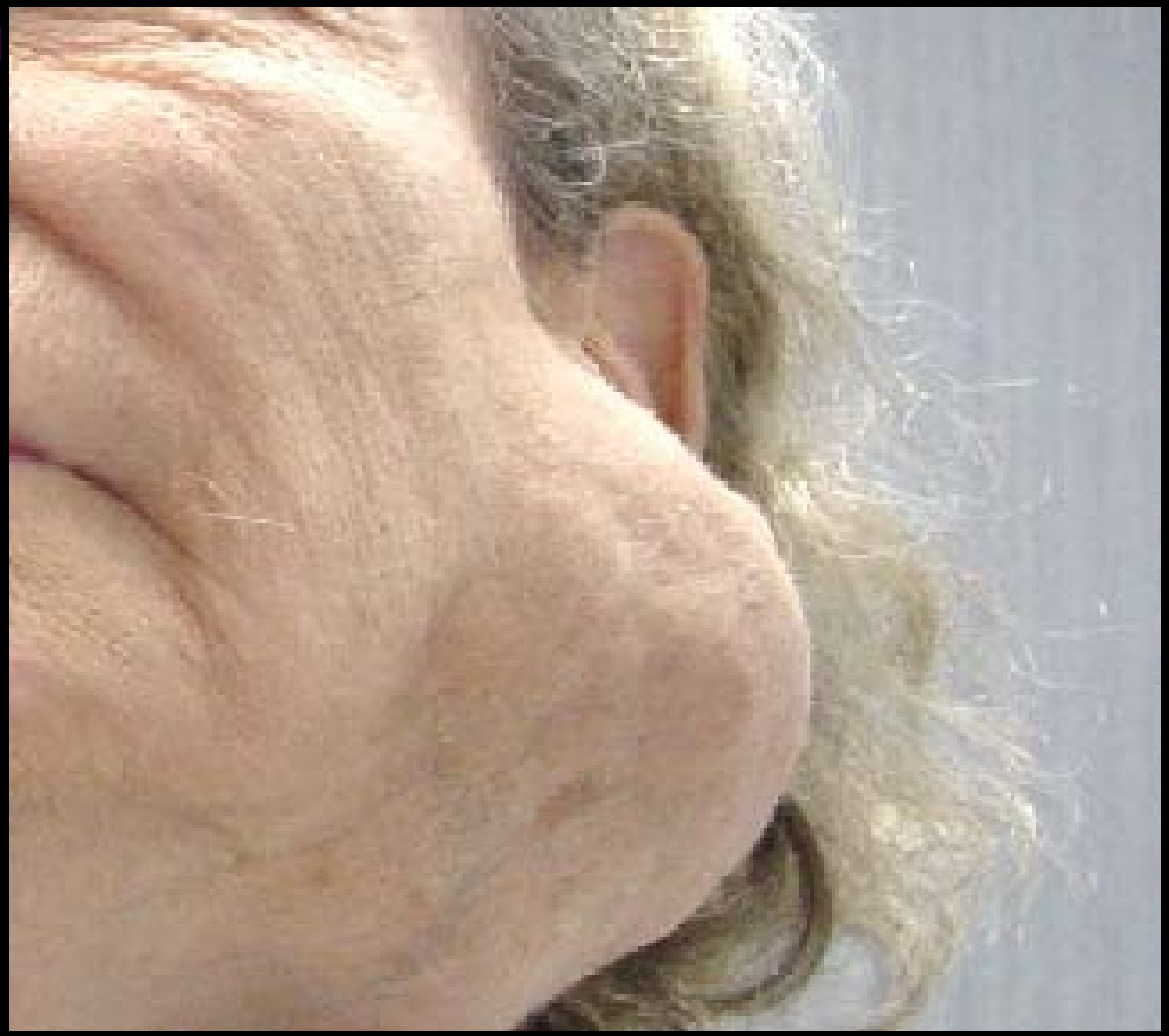
- **65 y old**
- **C/O : hoarseness X 10 Months**
- **Heavy smoker-2p/day X 40 years**
- **O/E :**
  - hoarse voice
  - Mild stridor
  - Neck mass 5X4 CM

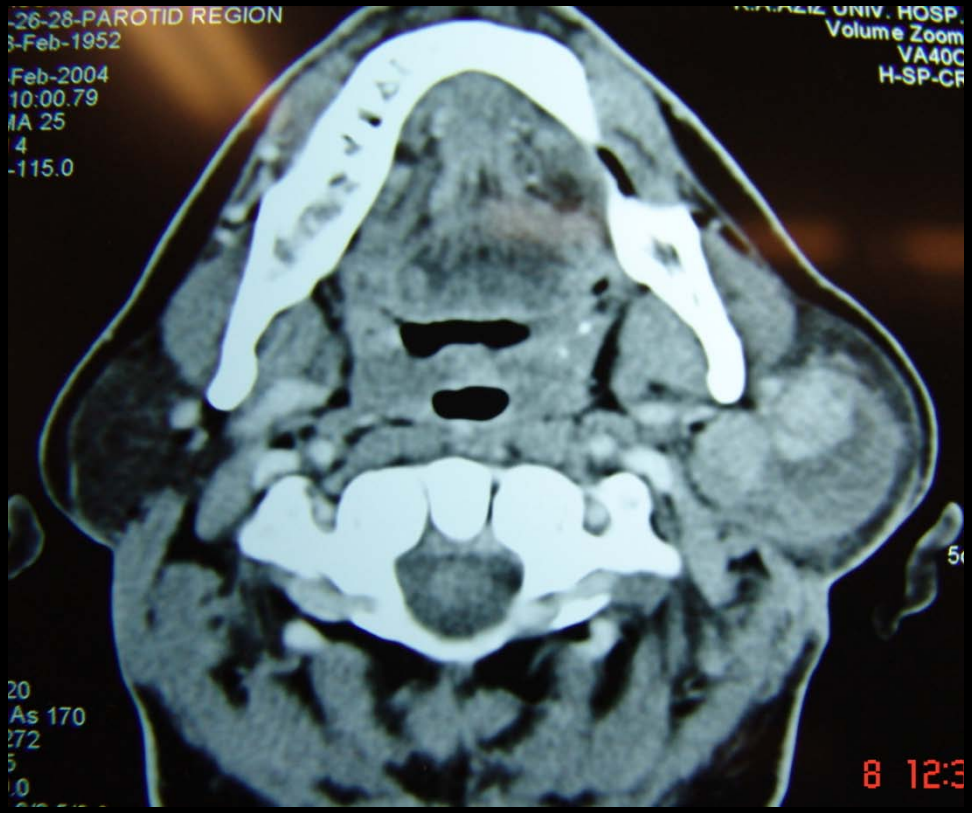




Case 4

- What is abnormal?
- What is your DDx?
- What is the most likely Dx?
- Work up
- What are the areas you should examine?
- Management
- Can we leave it?

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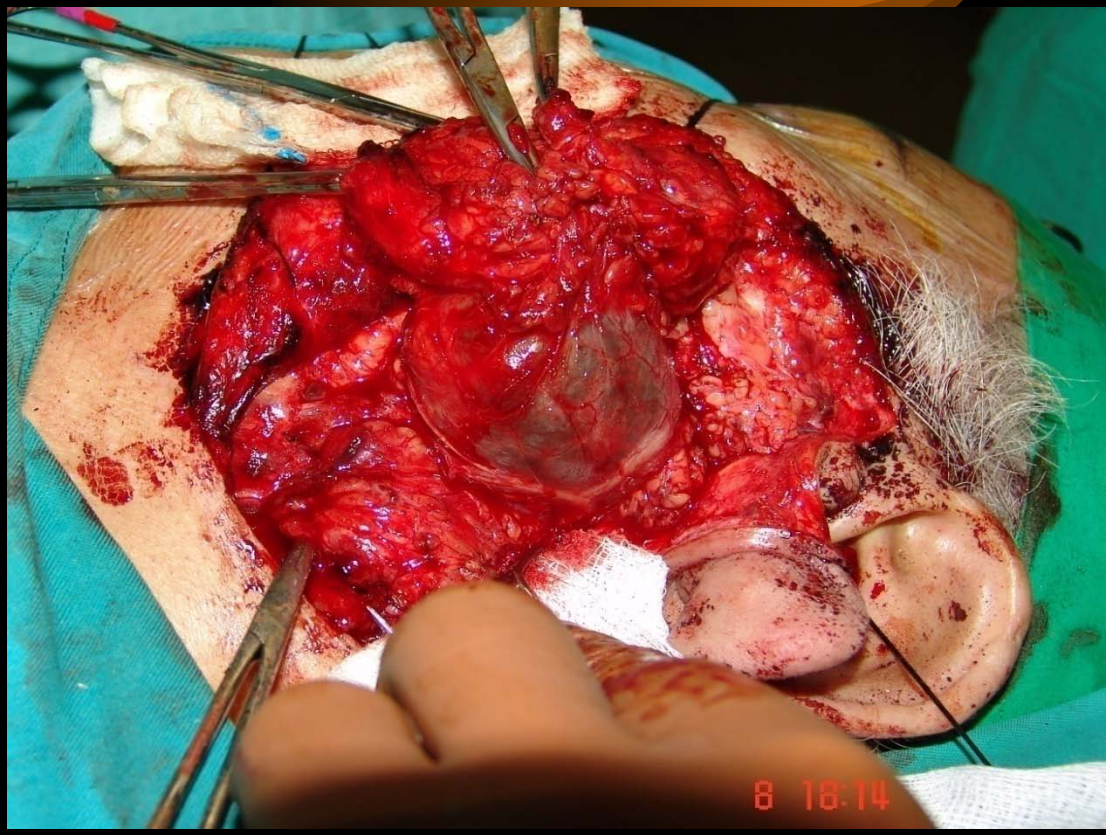
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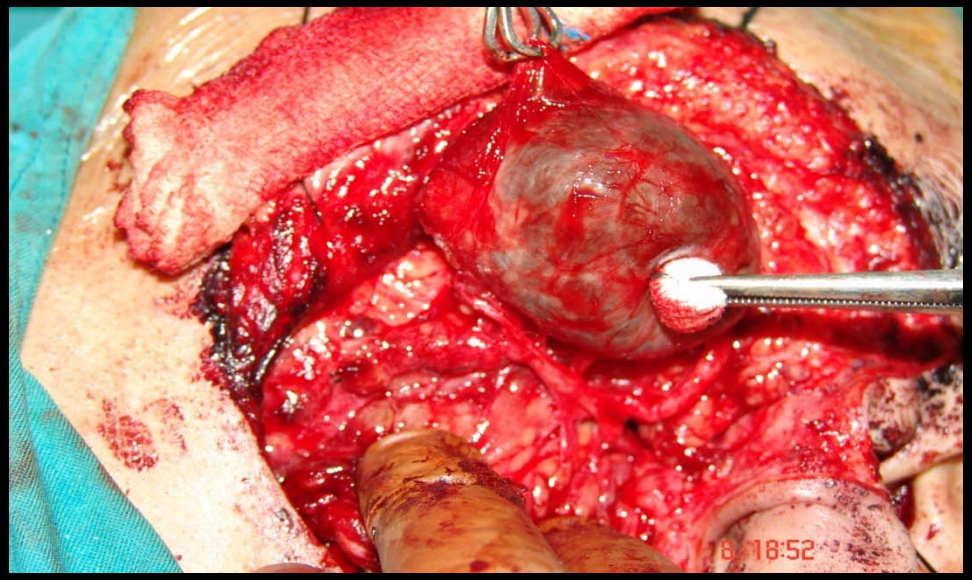
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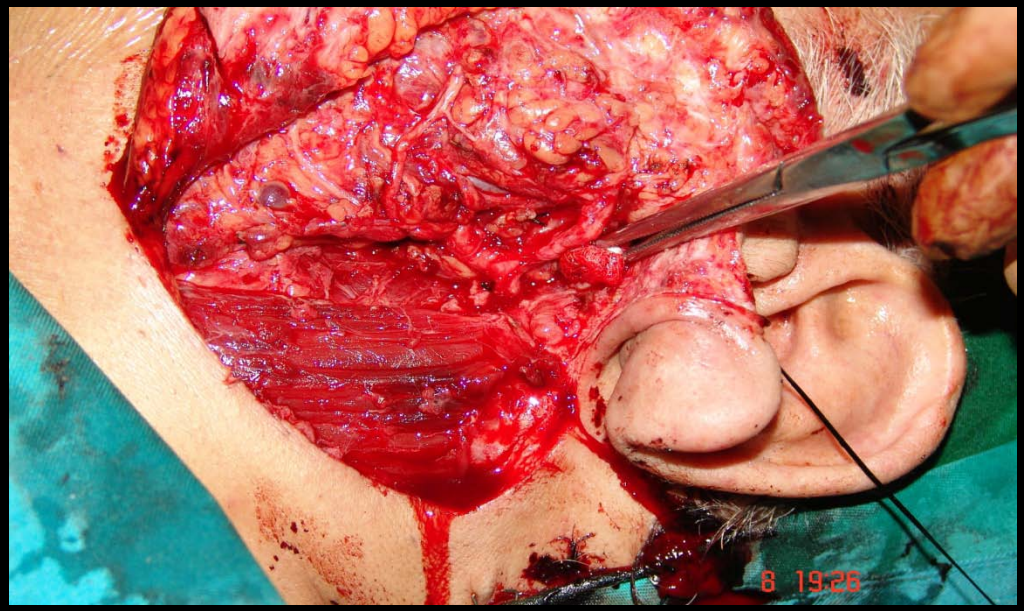
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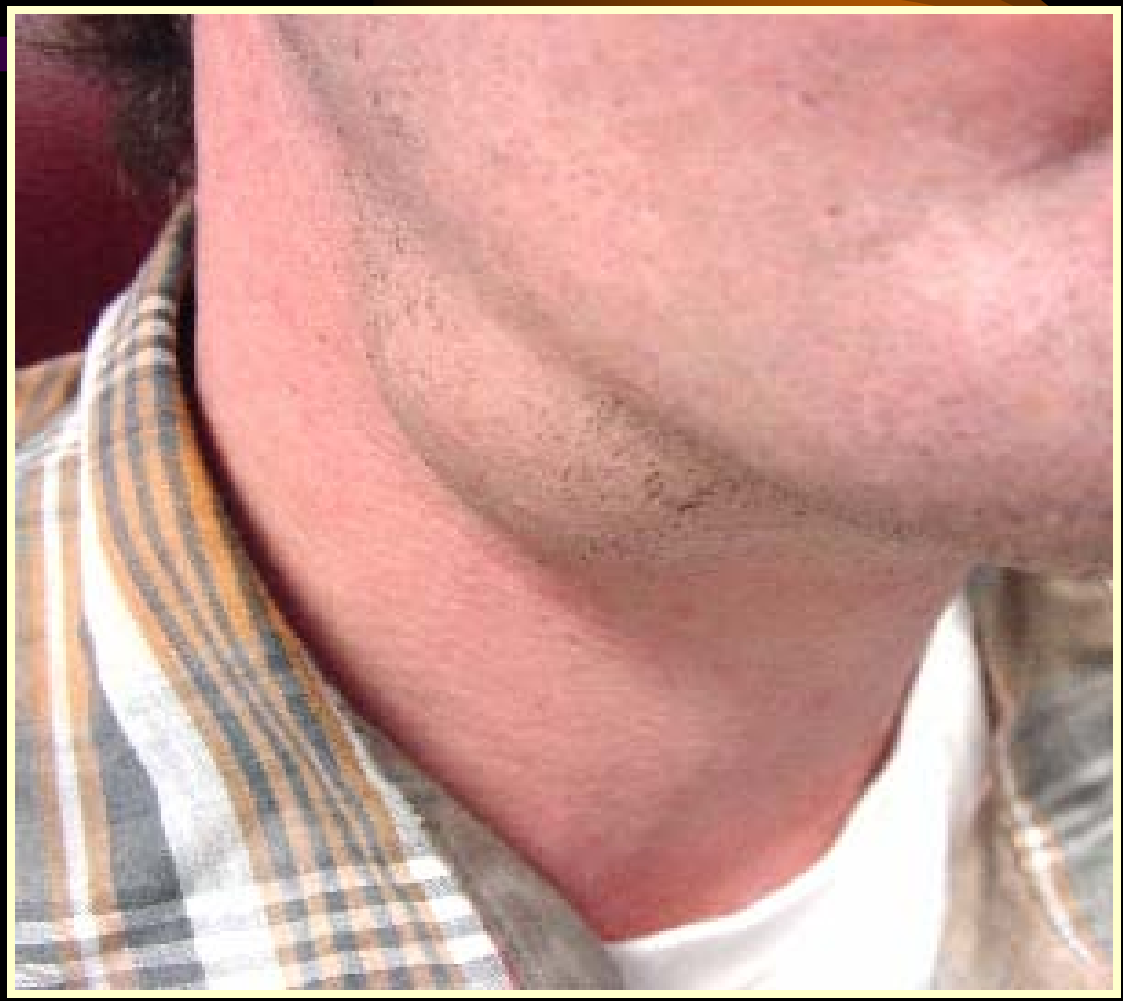
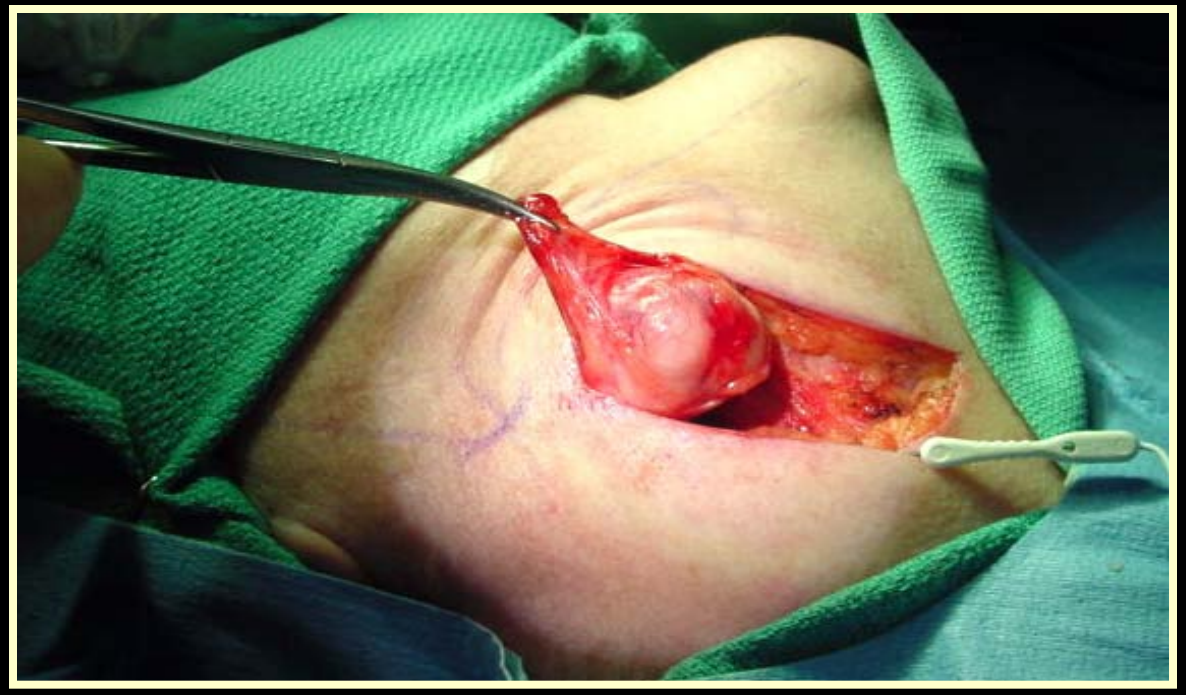
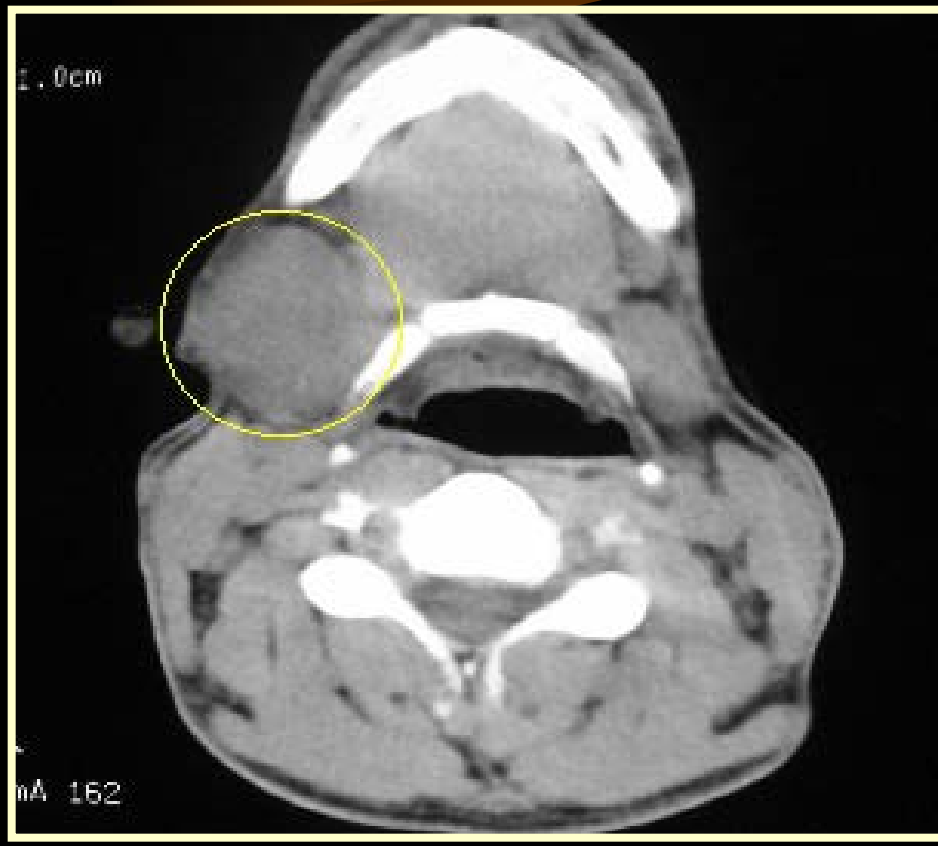
Case 5

- **What is abnormal?**
- **What is your DDx?**
- **What is the most likely Dx?**
- **Work up**
- **Management**



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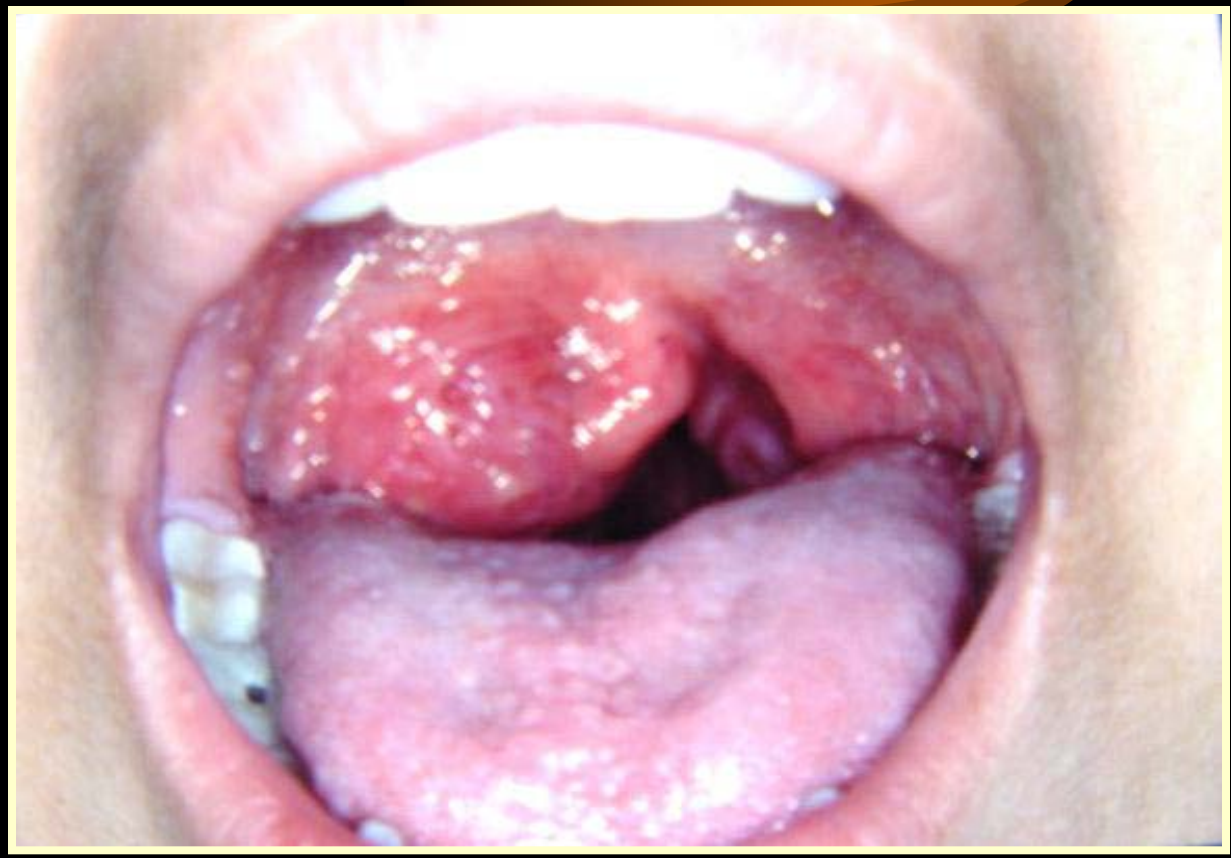
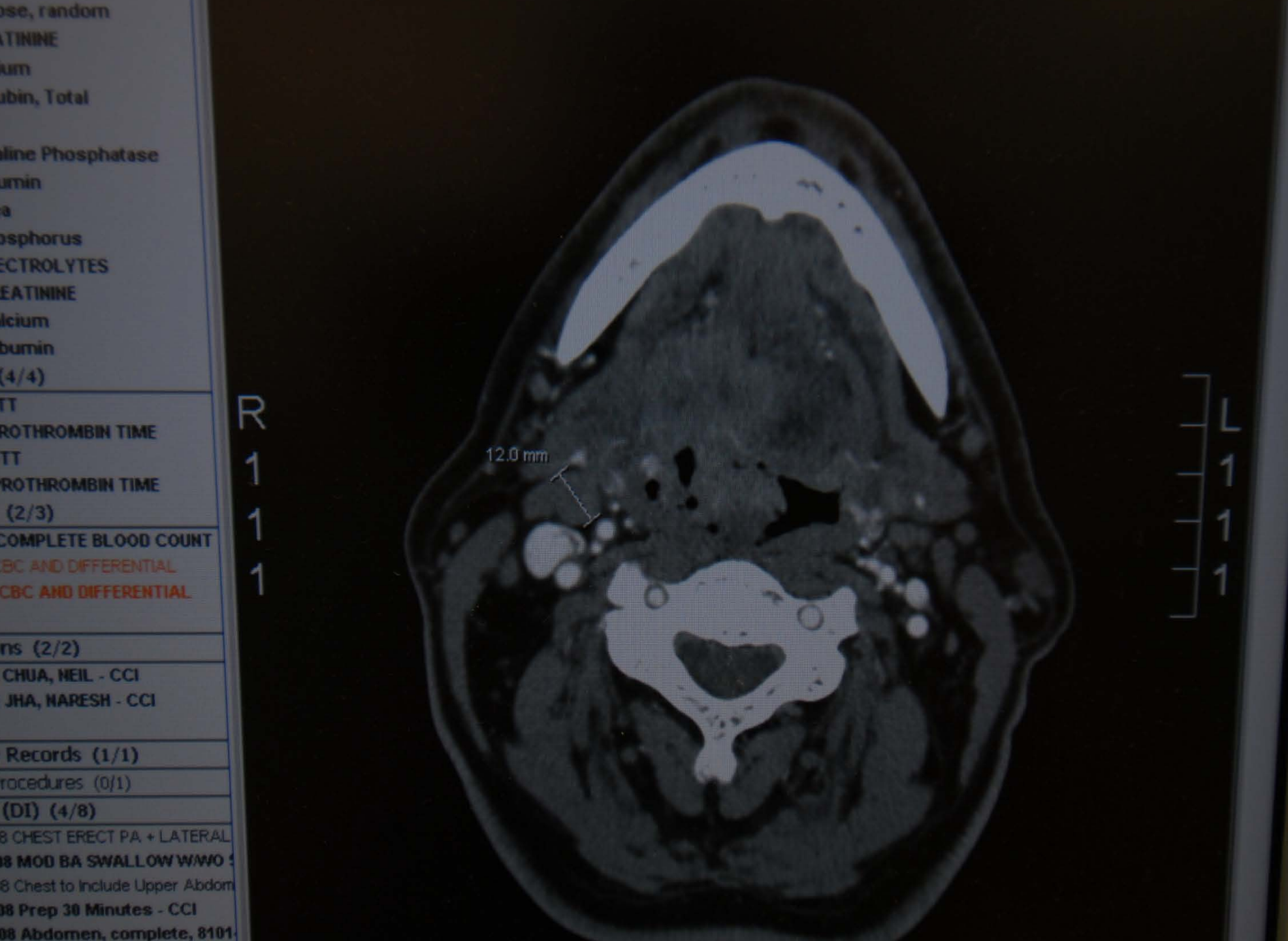
Case 6

- What is abnormal?
- What is your DDx?
- What is the most likely Dx?
- Work up
- Management





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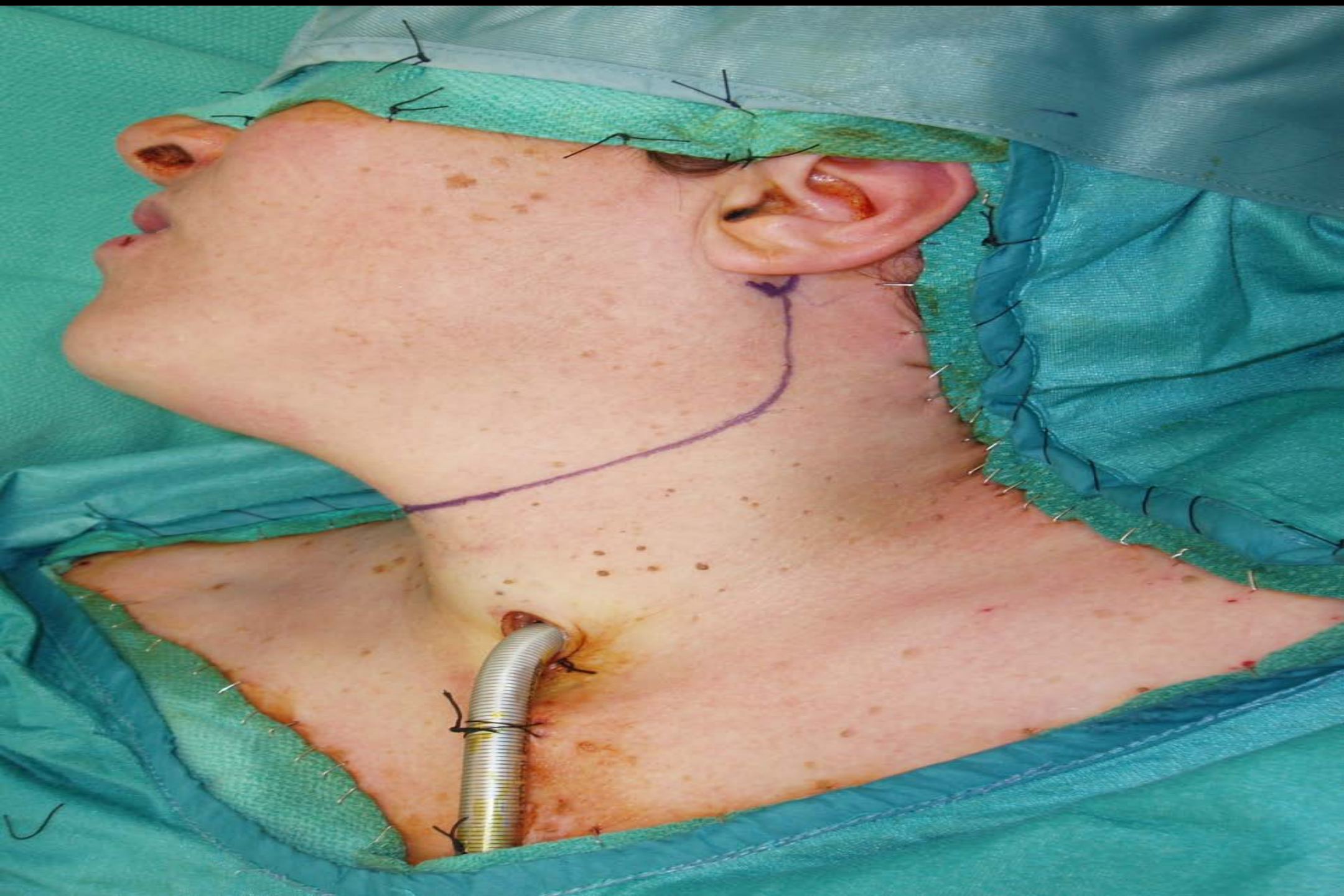
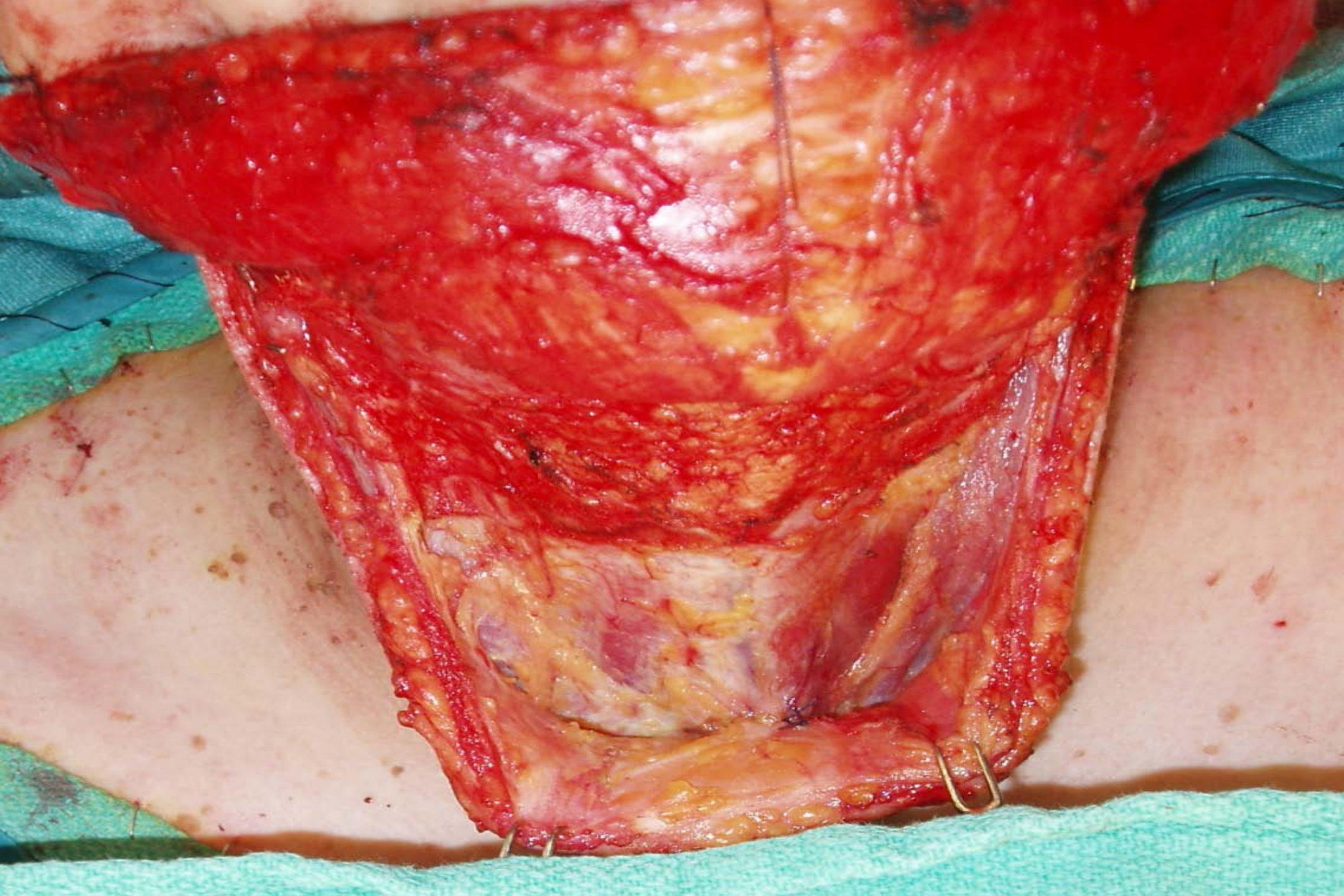
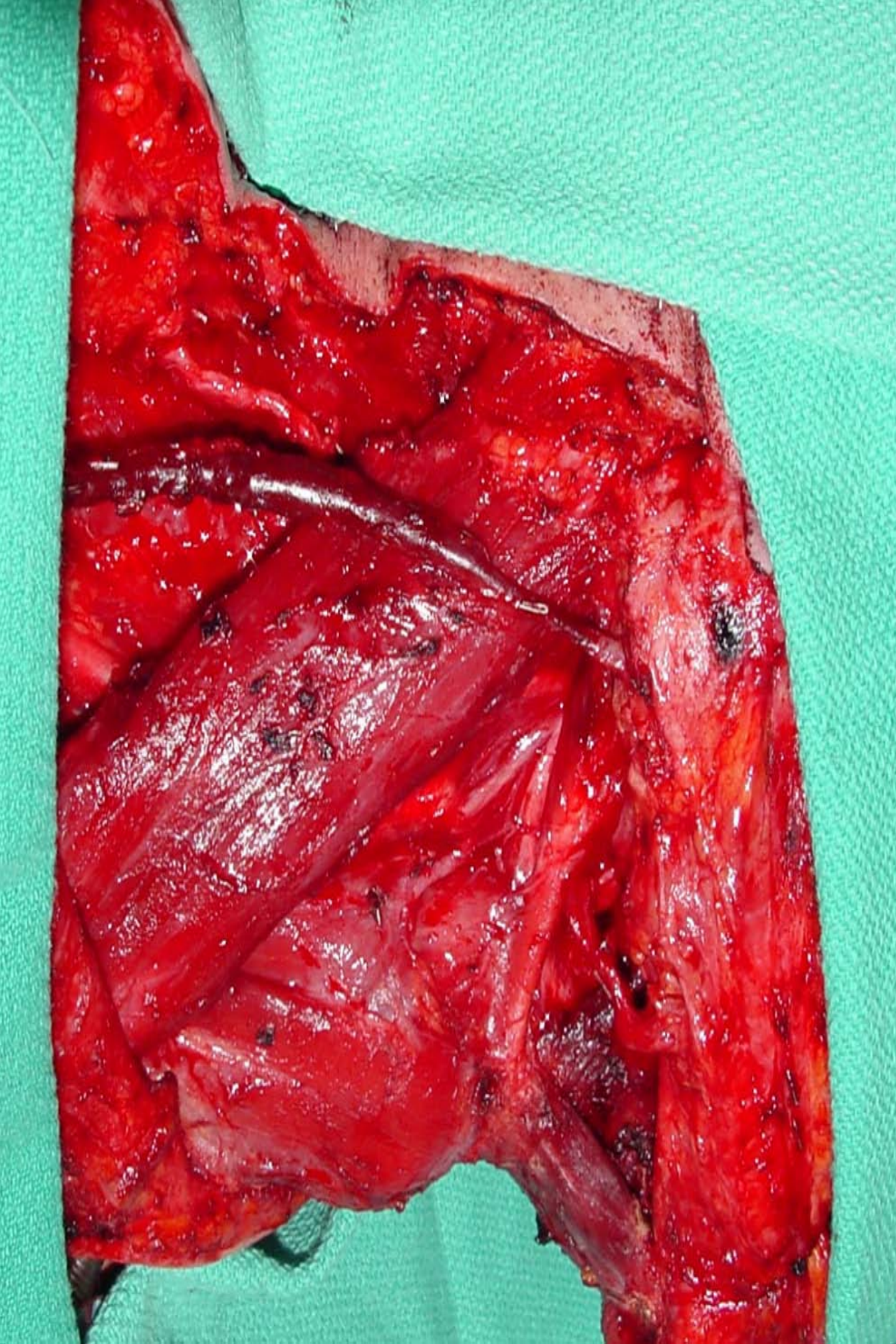
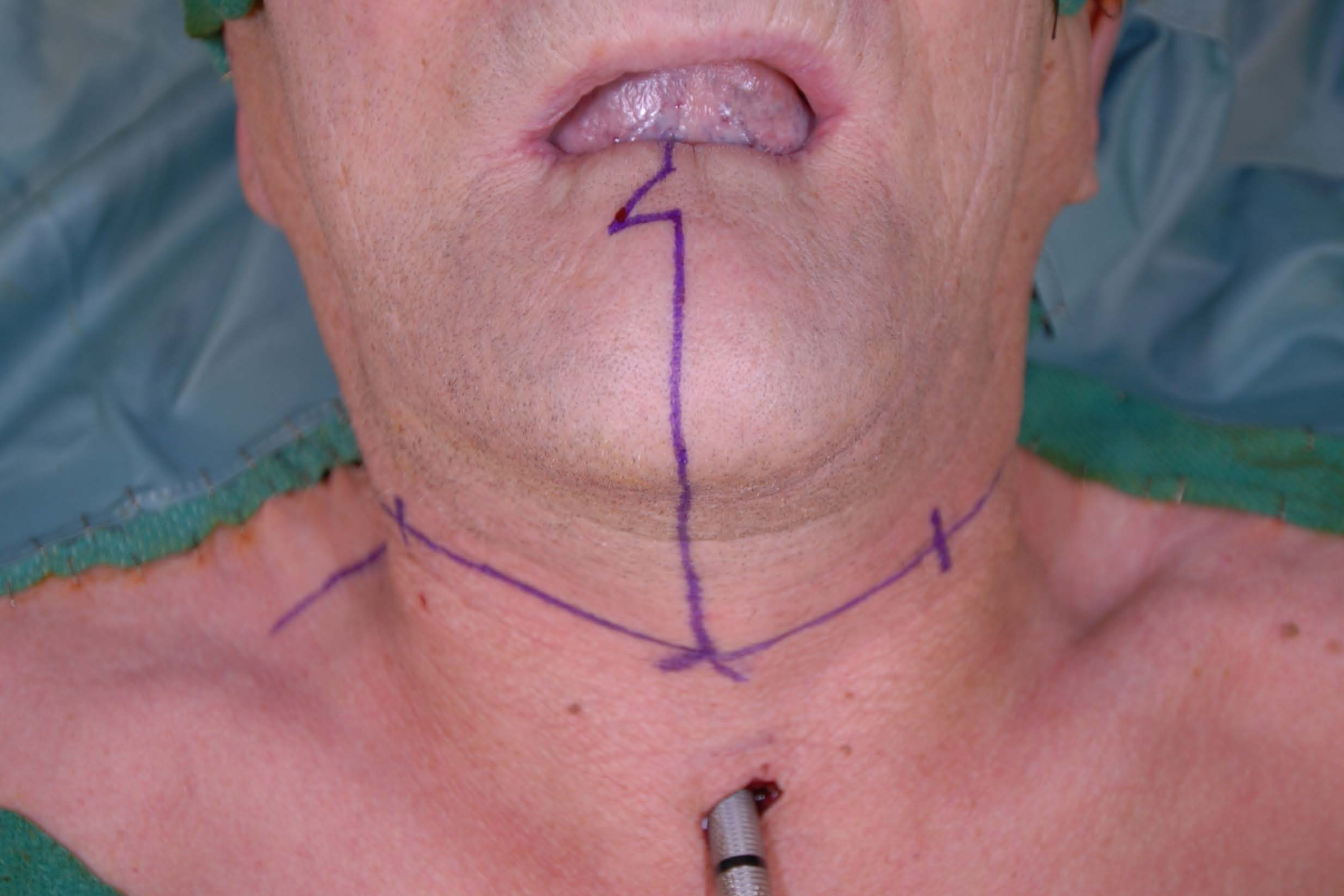
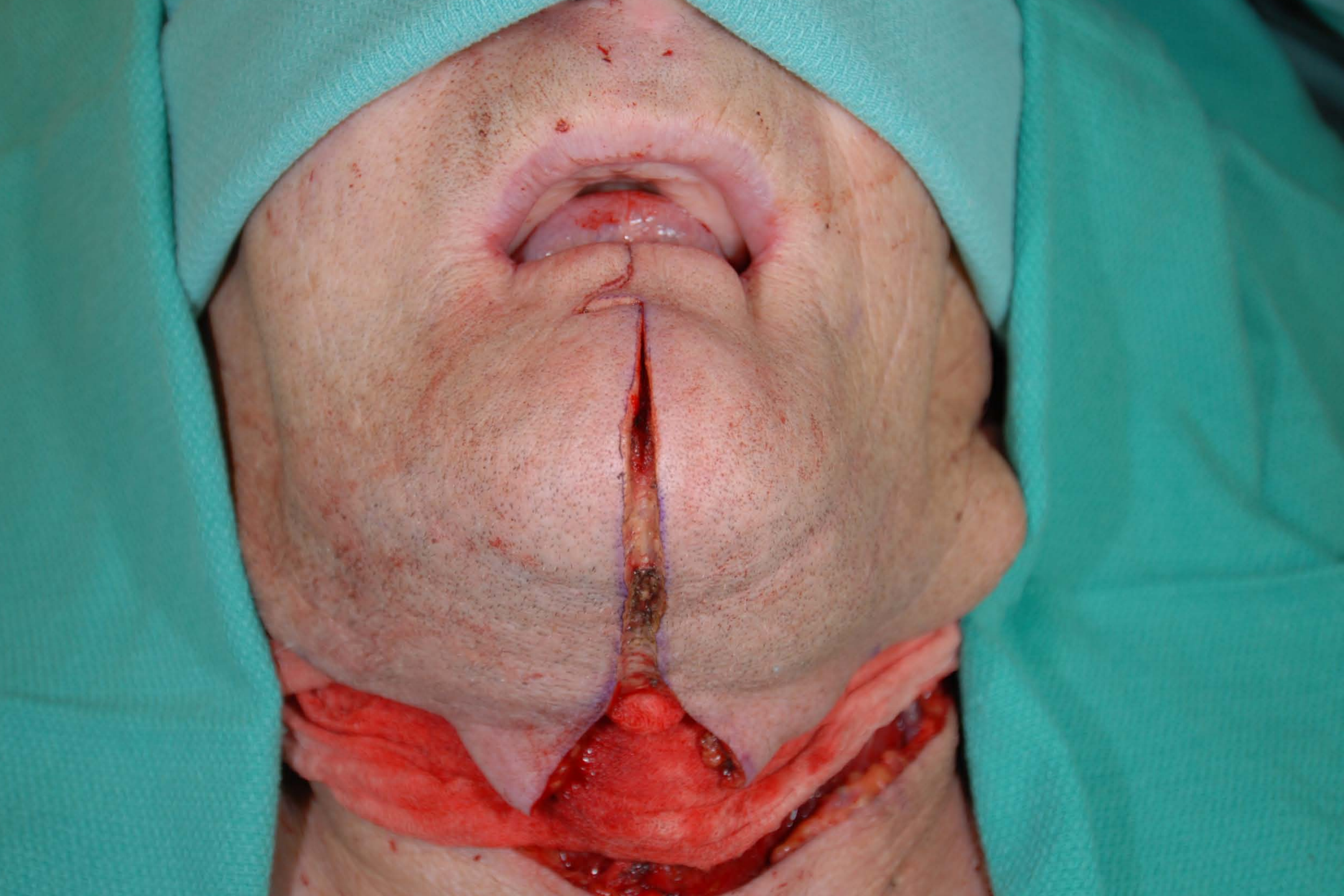
8 CHEST ERECT PA + LATERAL
08 MOD BA SWALLOW W/WO
8 Chest to Include Upper Abdom
08 Prep 30 Minutes - CCI
08 Abdomen, complete, 8101

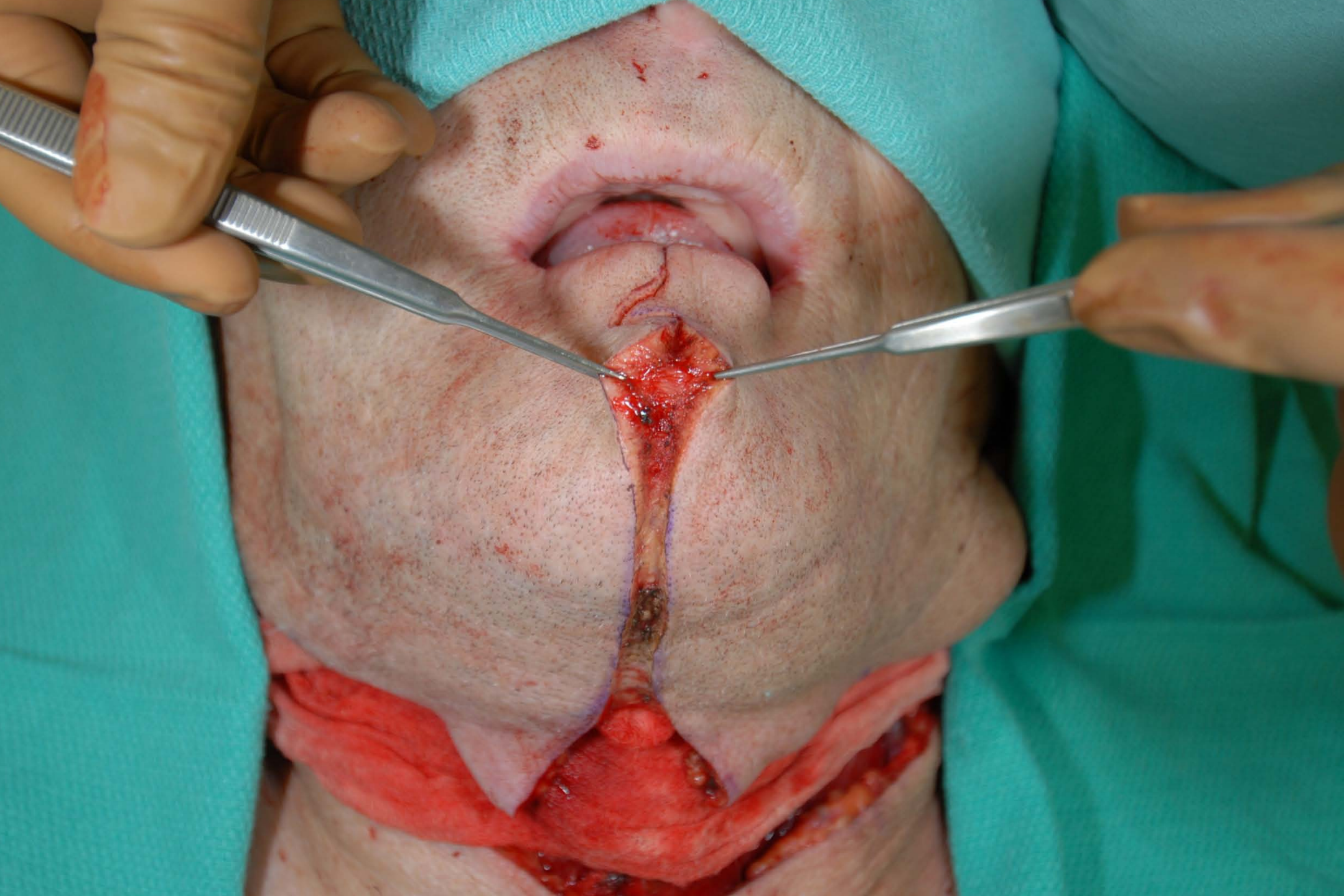


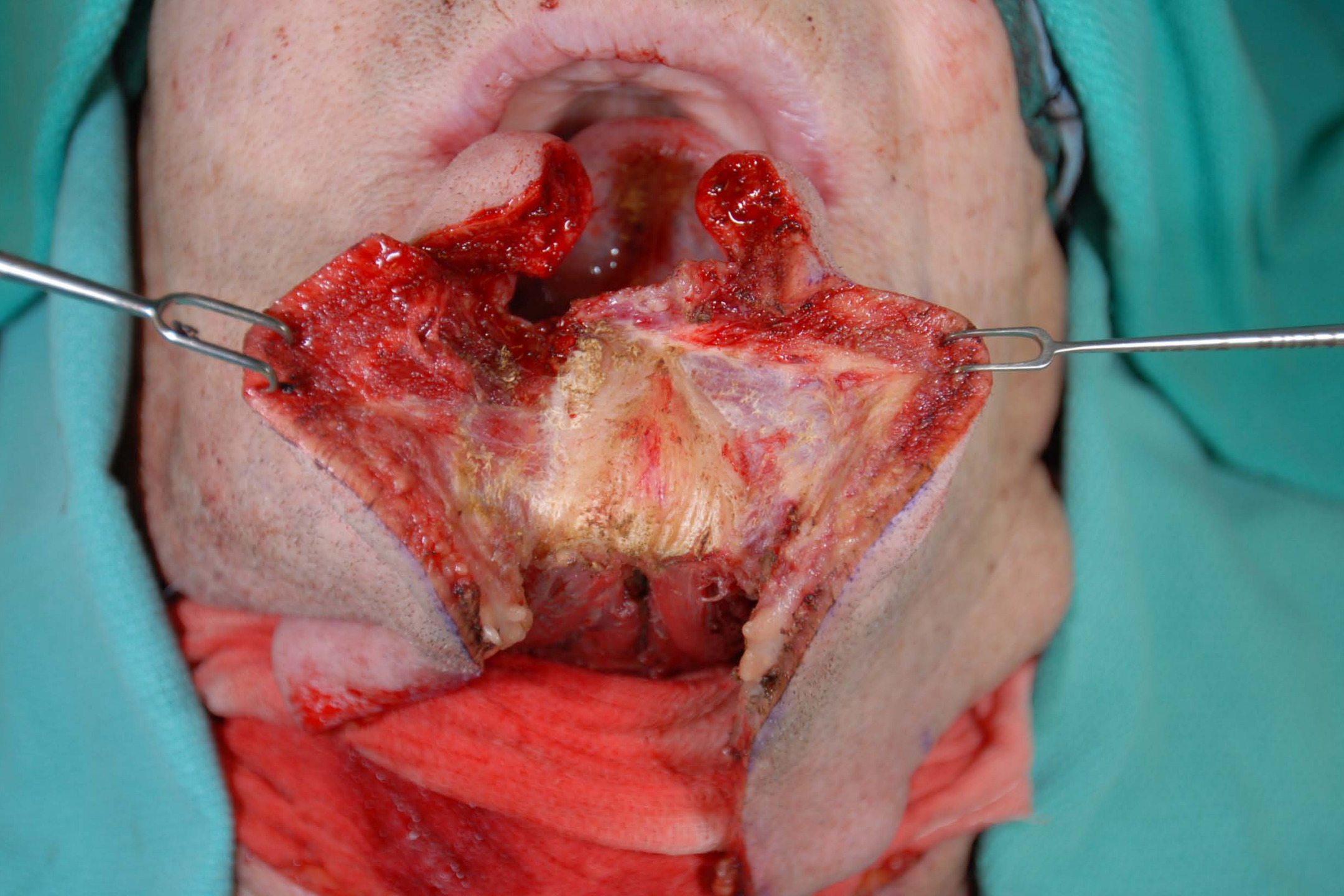


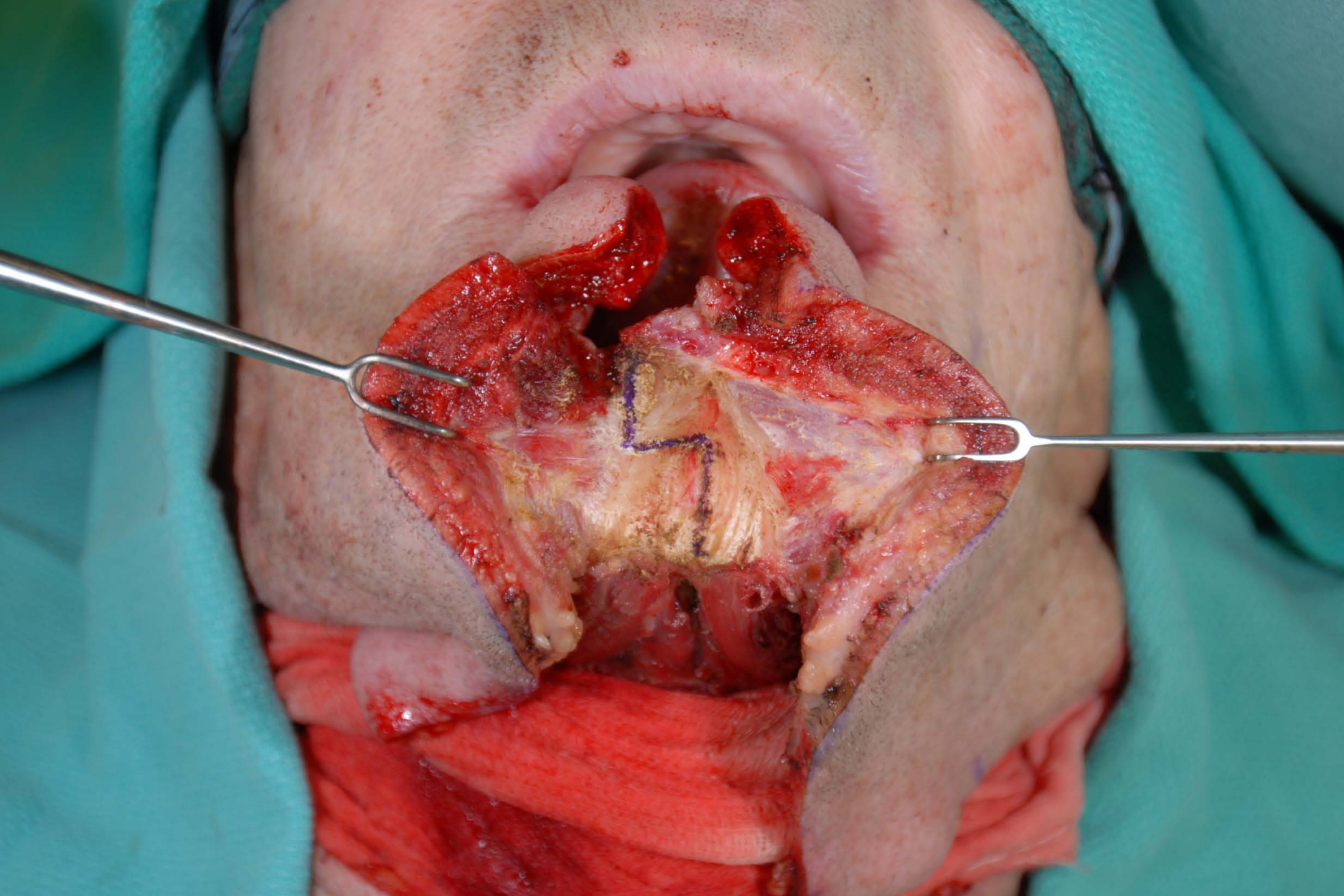


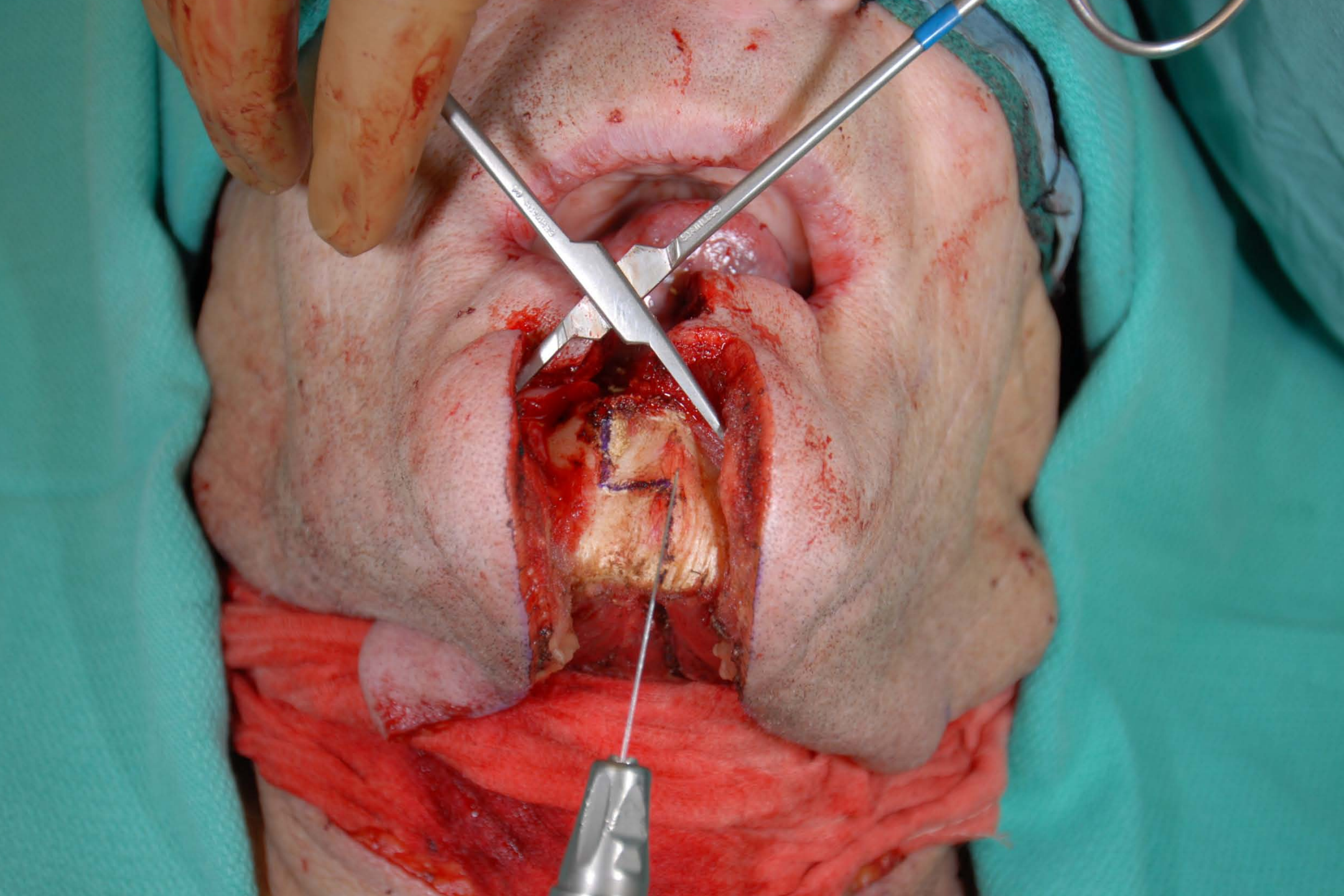


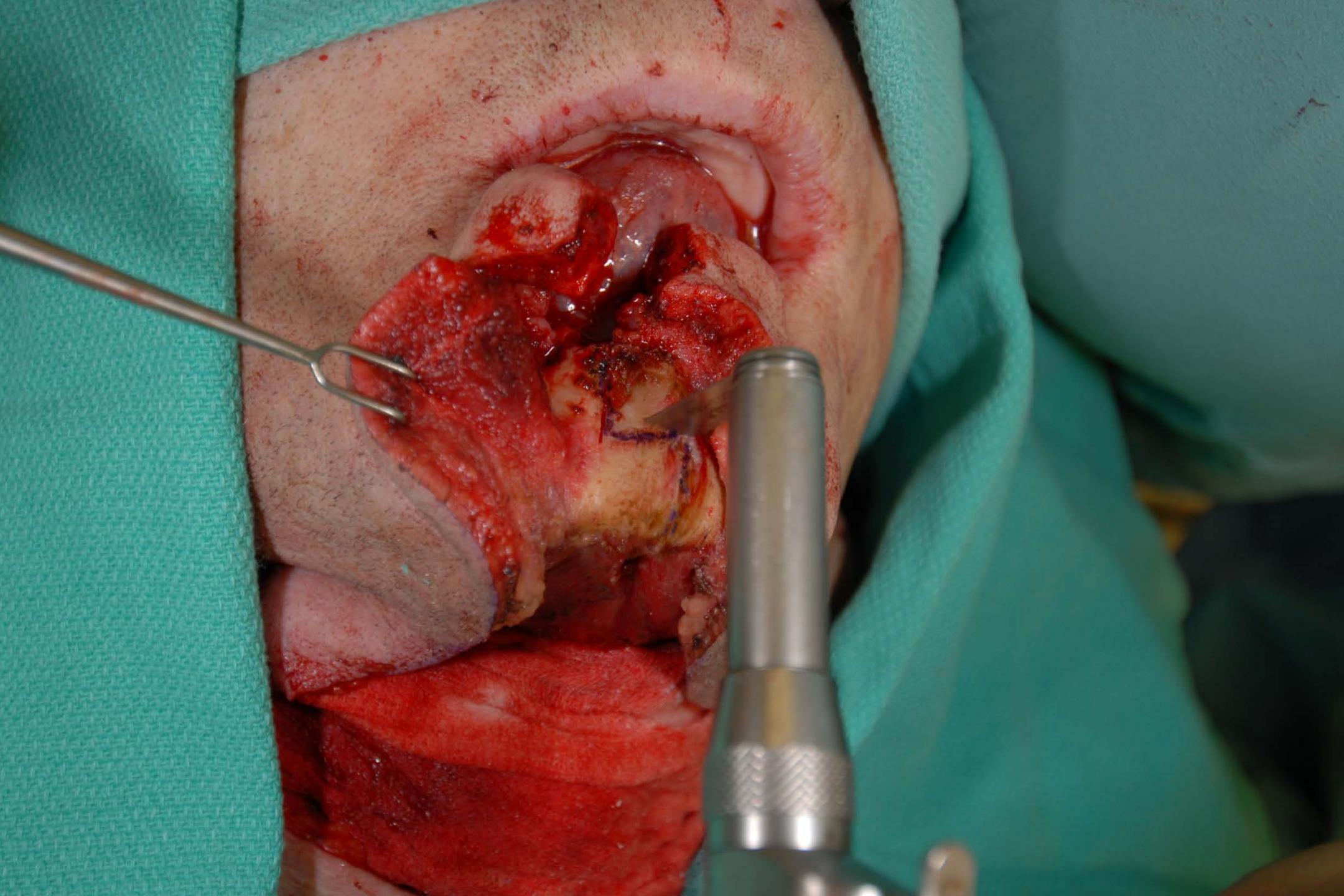


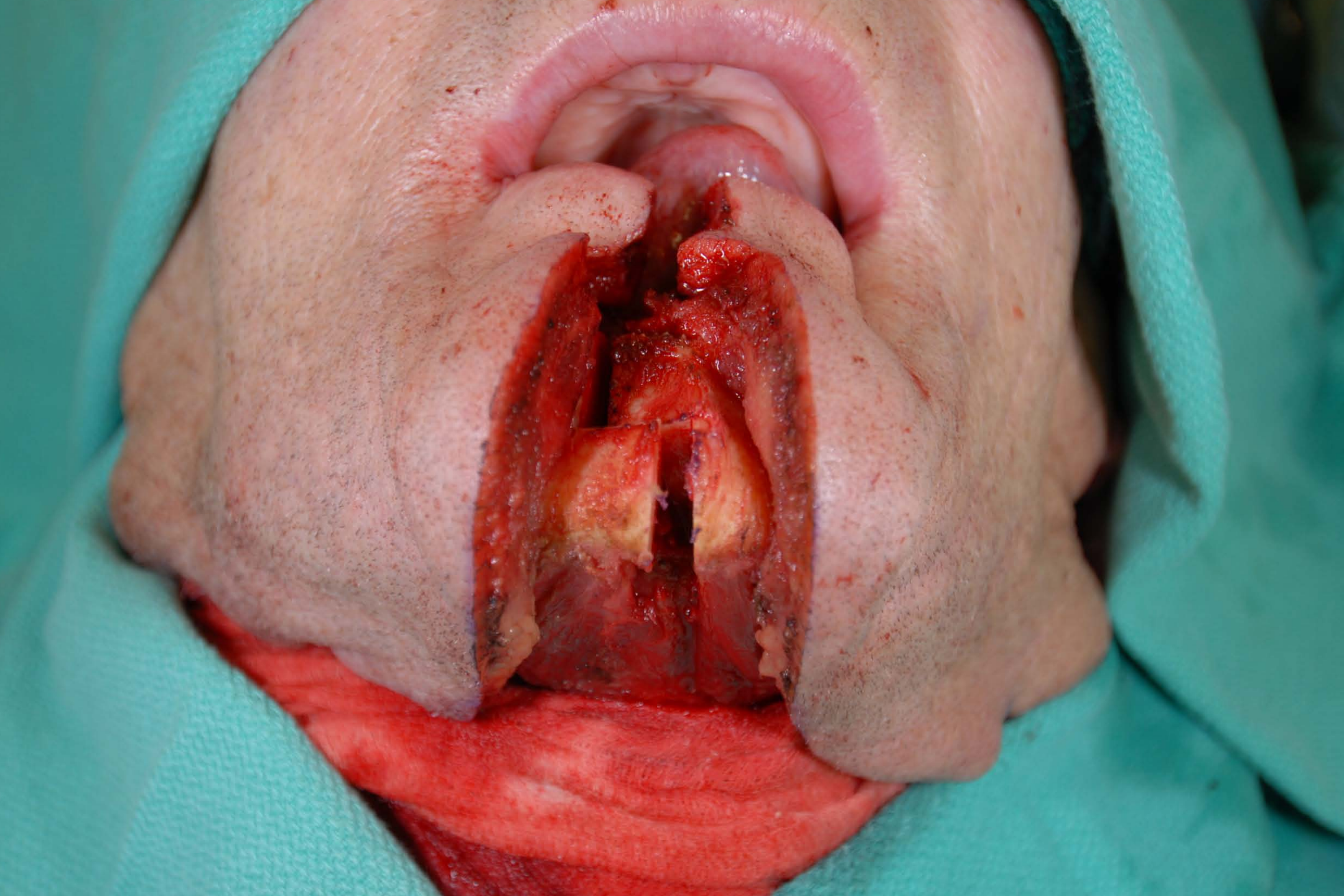


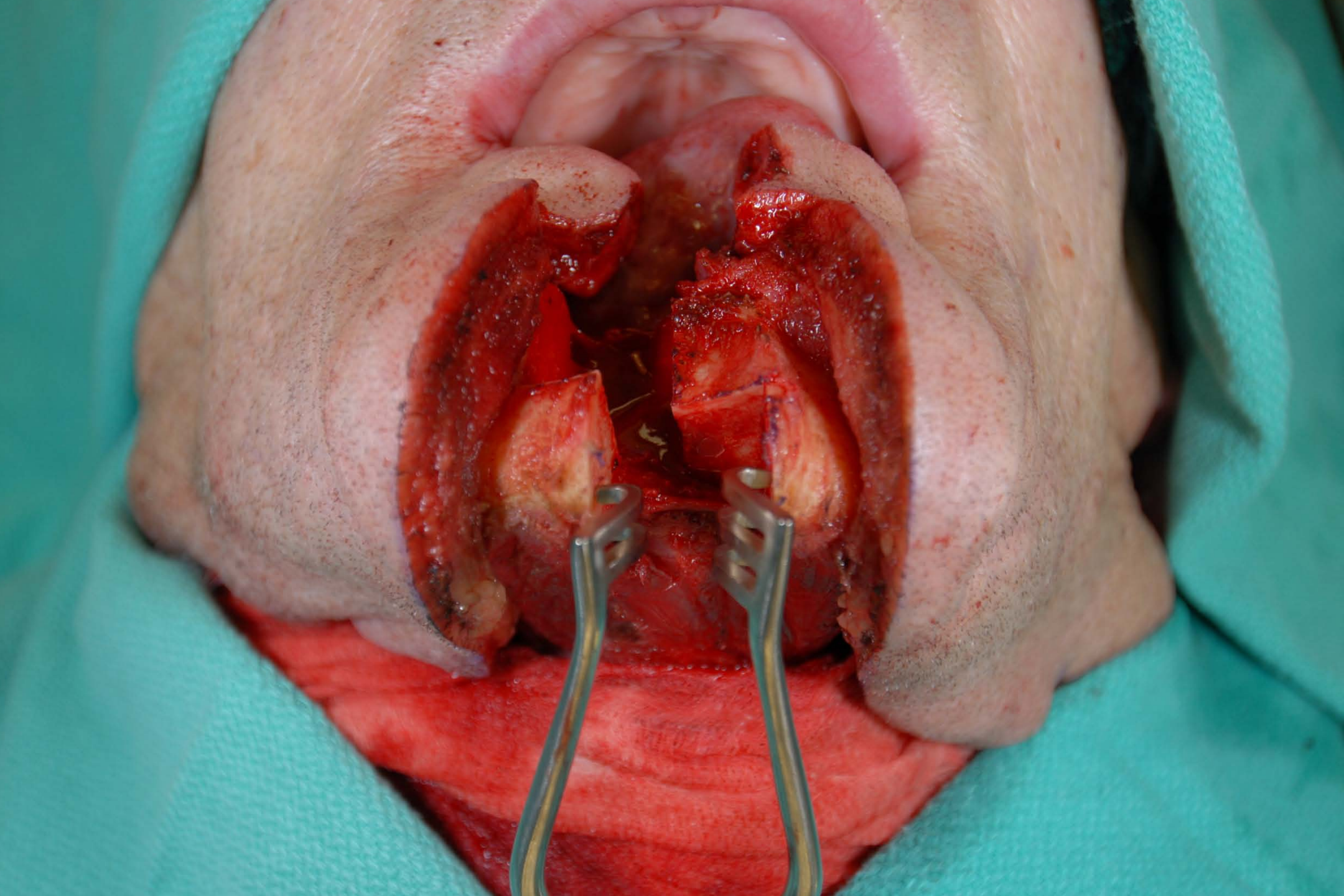


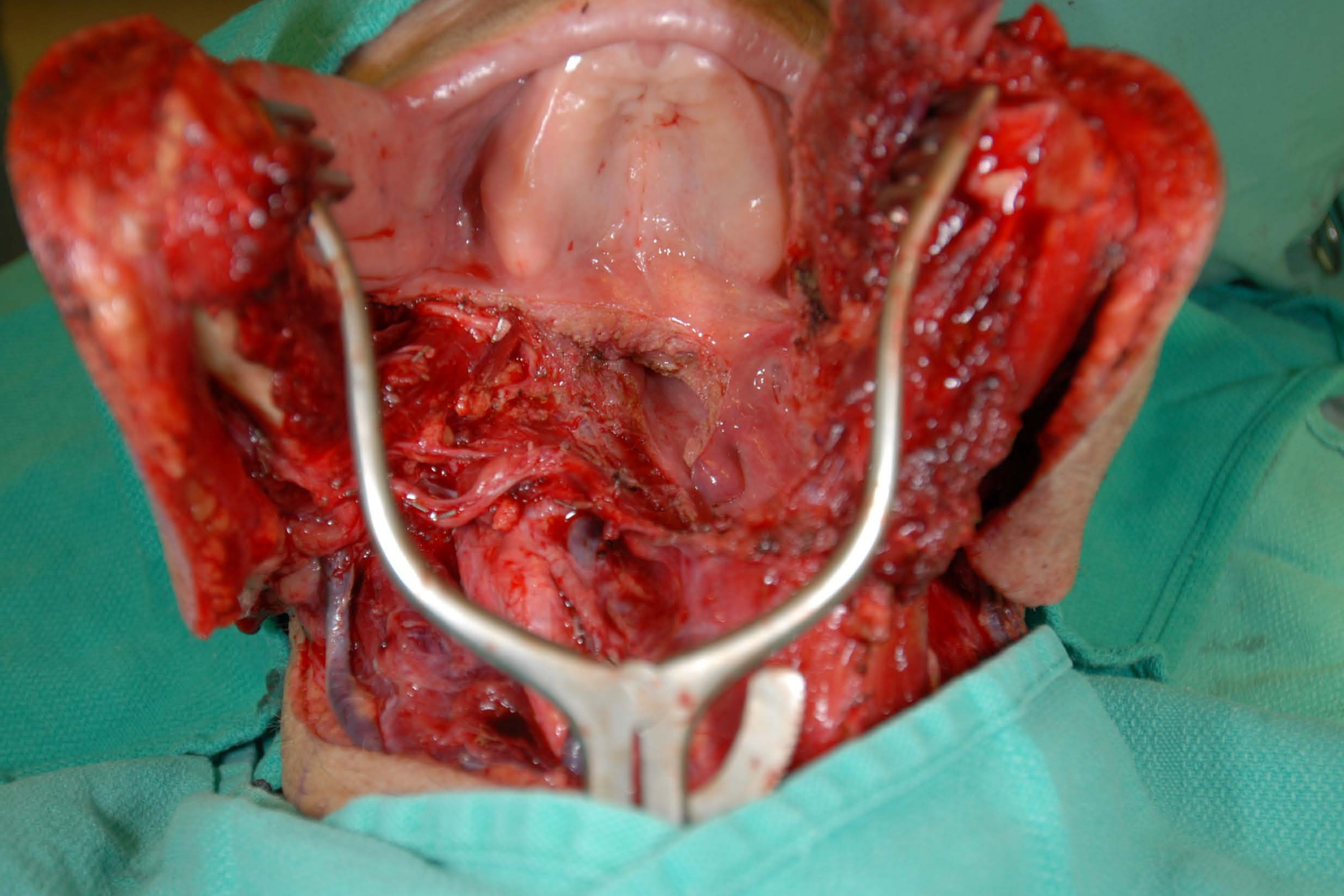


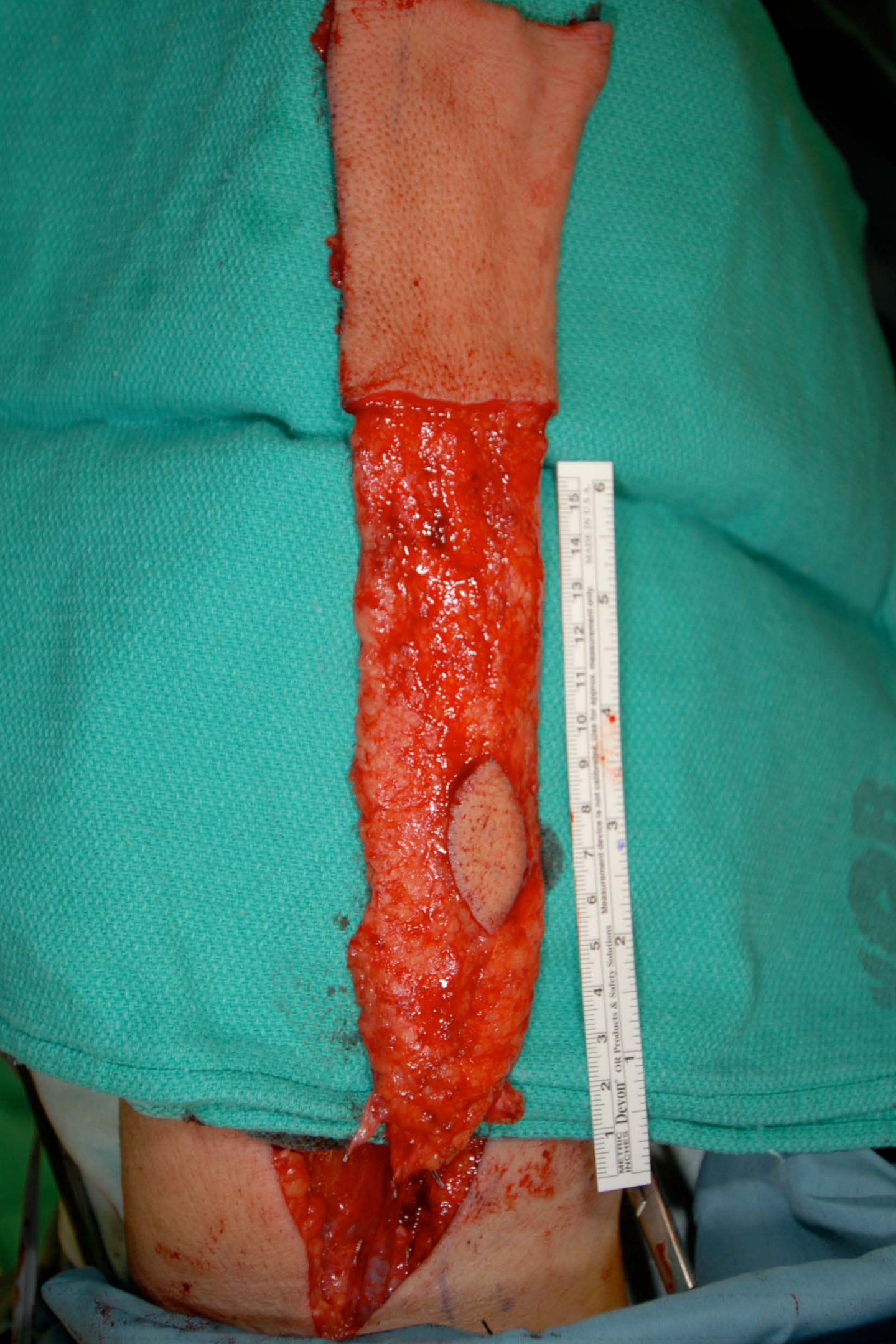








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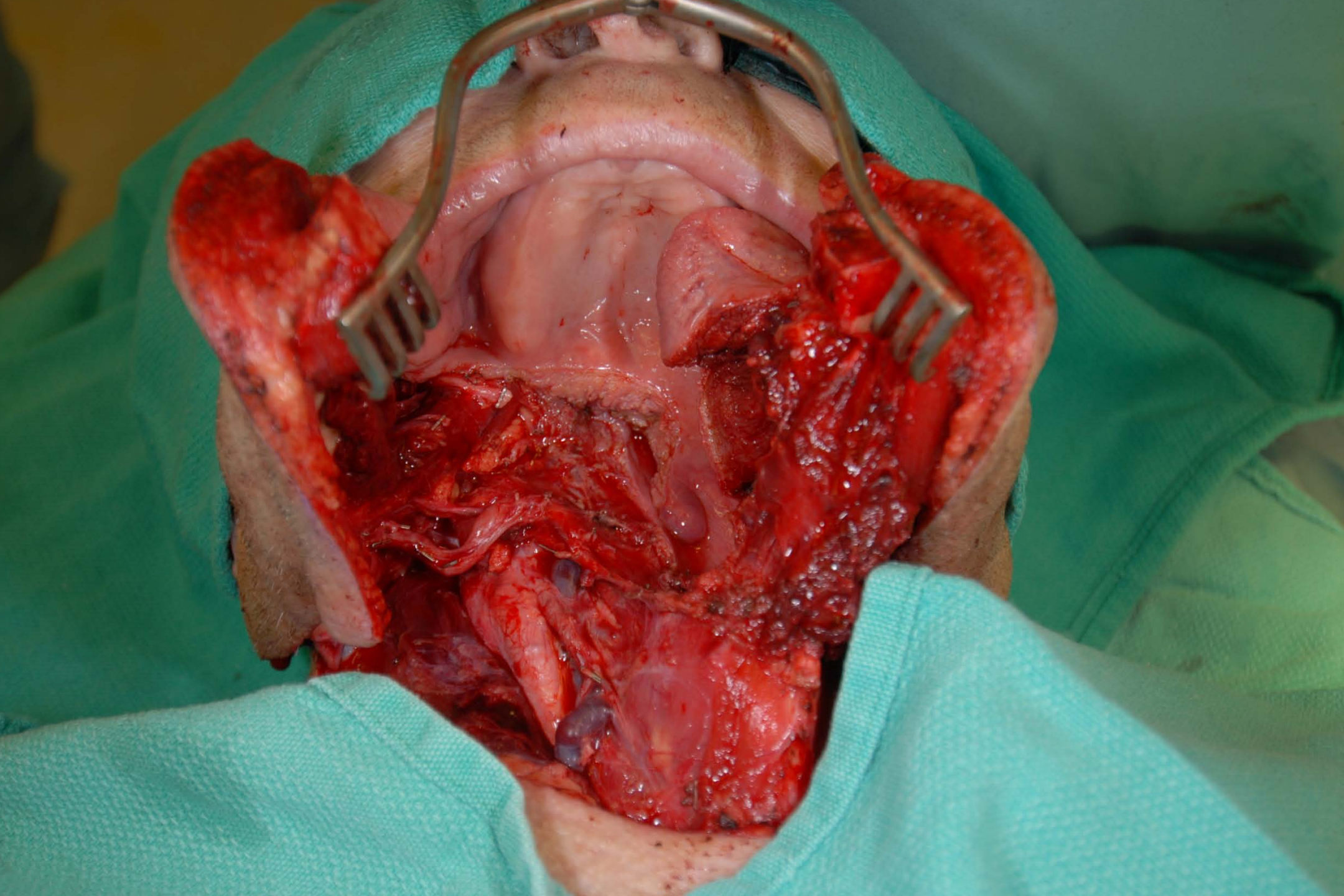
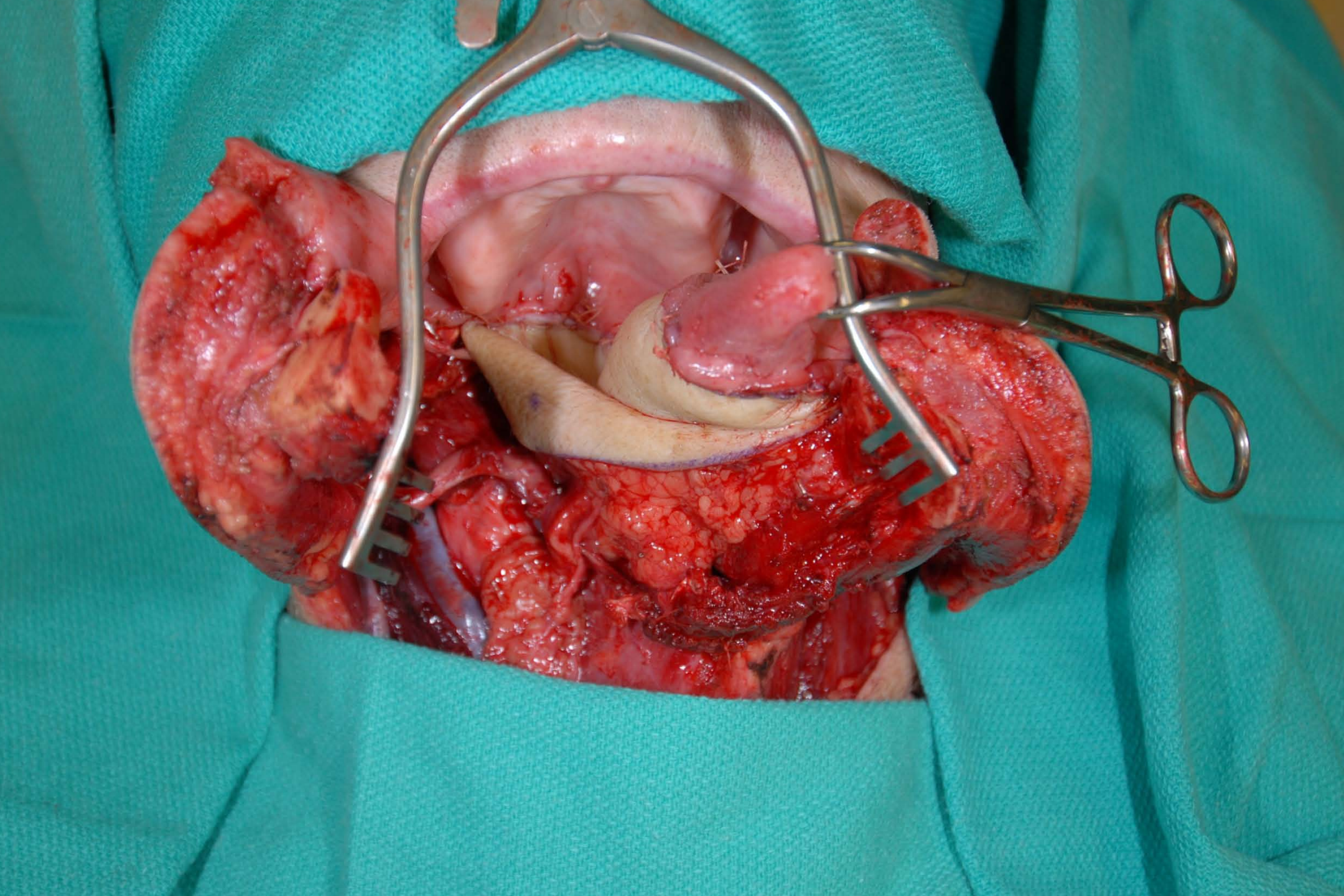
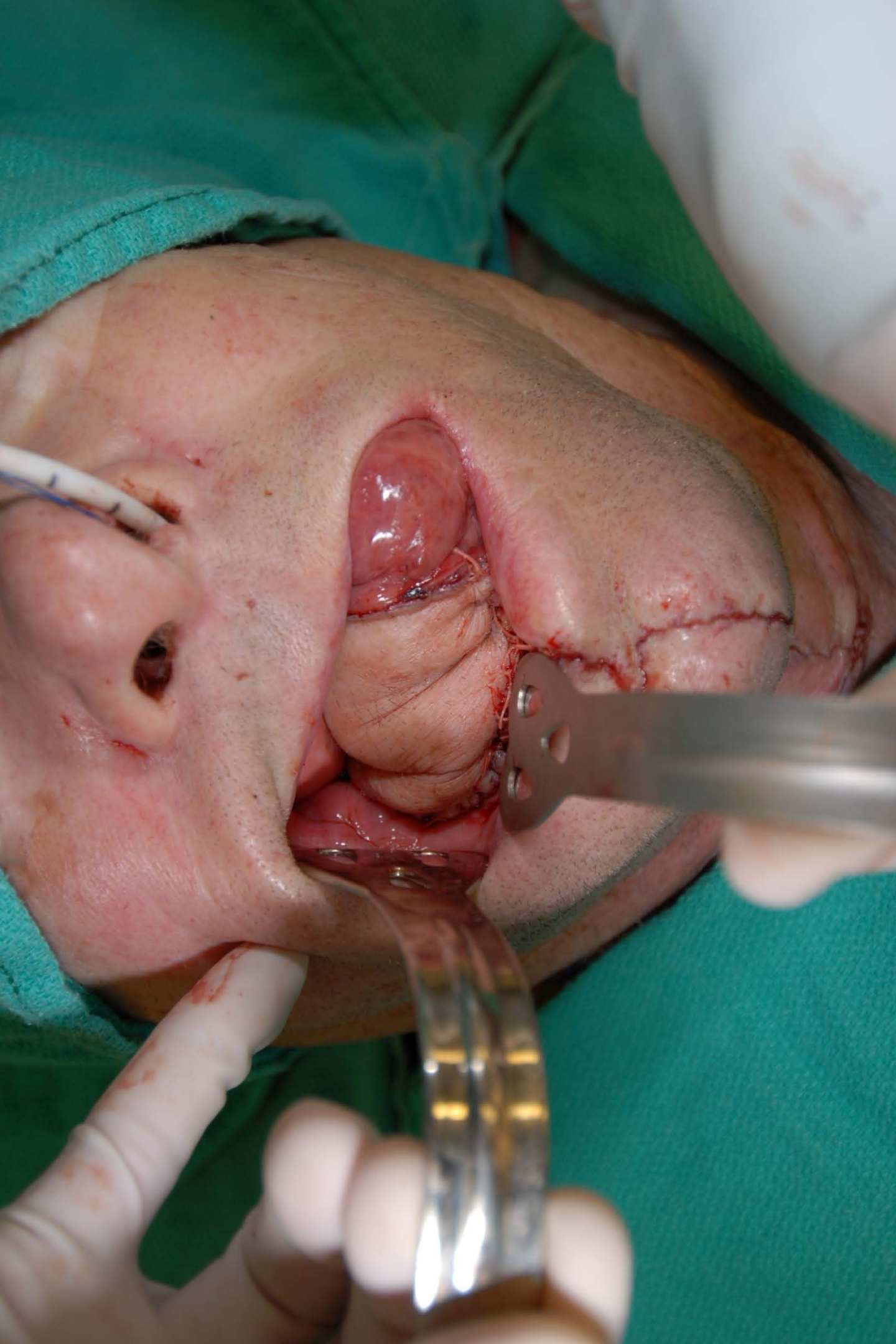
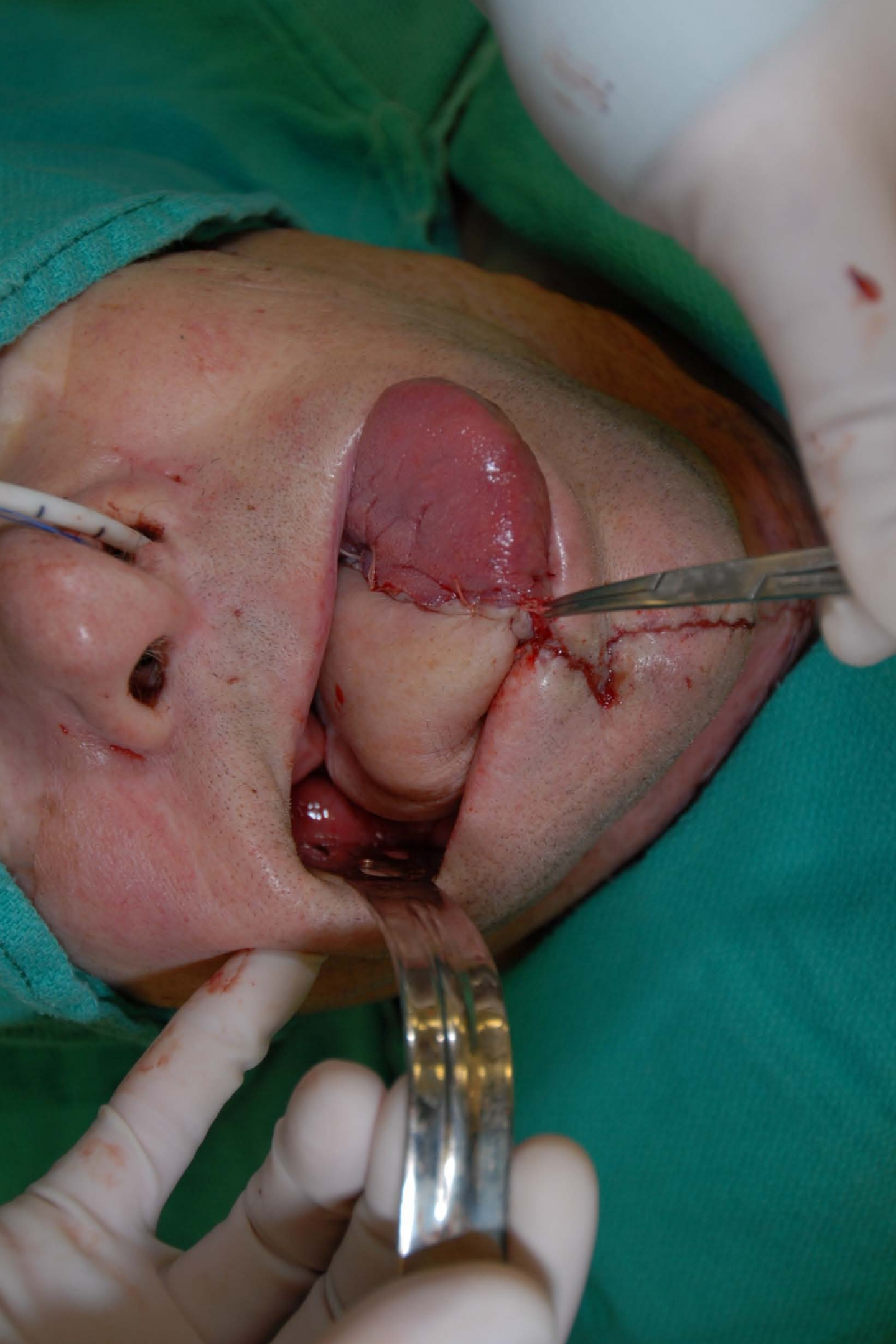
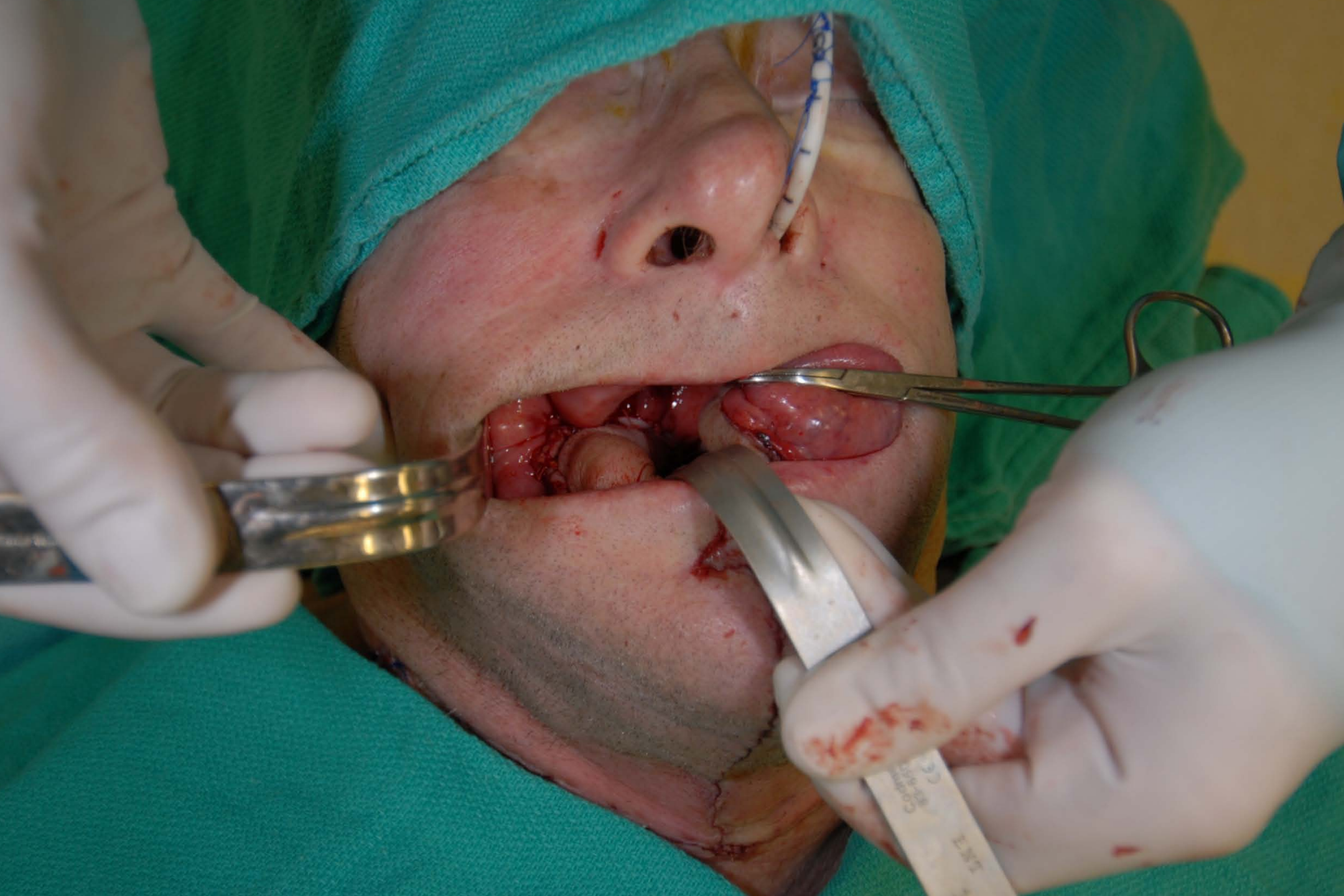
Measurement device is not calibrated. Use for approx. measurement only
MADE IN U.S.A.











Thank You