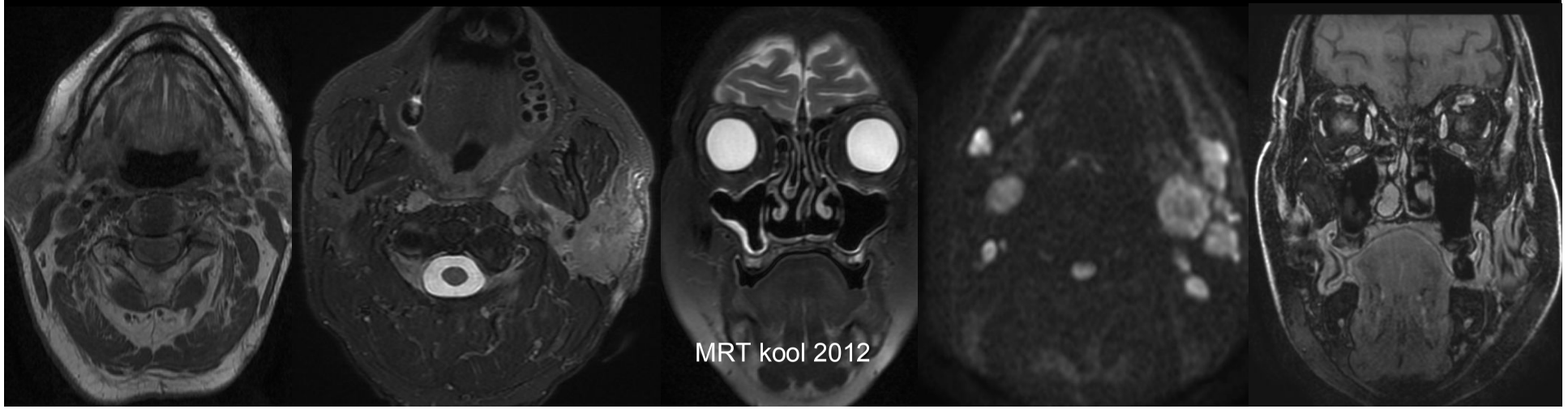
Näo-kaela piirkonna anatoomia, arengulised muutused

Äli Roose
Regionaalhaigla



Täna kavas

- Näo- ja kaela piirkonna ANATOOMIA
- Kaela lümfisõlmed
- Füsioloogilised ja kaasasündinud muutused

Täna kavas ei ole

- **VIII SEMINAR 17. veebruar 2010** (AS ITK)
  Ettekanne: Tarvo Sillat "Kraniaalnärvid 1"
  Ettekanne: Riste Saat "Kraniaalnärvid 2"

Kaela piirkonna anatoomia

Keeleluust üleval

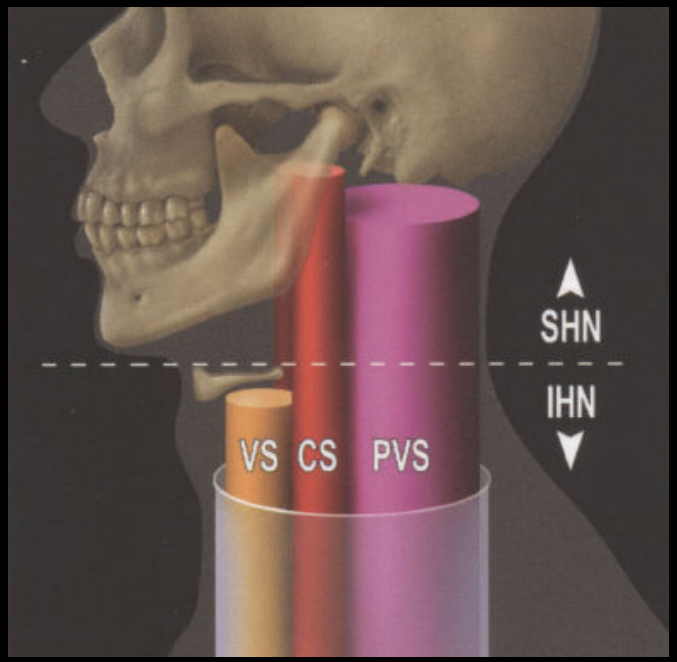
SHN Suprahyoid neck

- Silmakoobas
- Ninaõõs ja ninakõrvalkoopad
- Suuõõs
  - Keelealune ruum
  - Submandibulaarruum
- Ninaneel, suuneel
- Kaela süvaruumid

Keeleluust allpool

IHN Infrahyoid neck

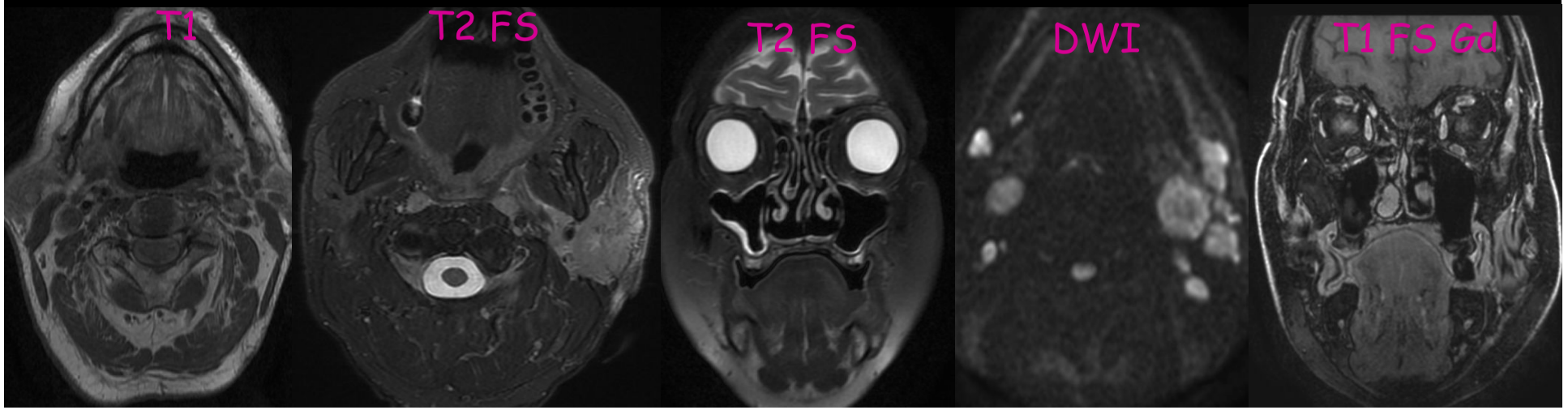
- Kõri
- Alaneel
- Kaela süvaruumid



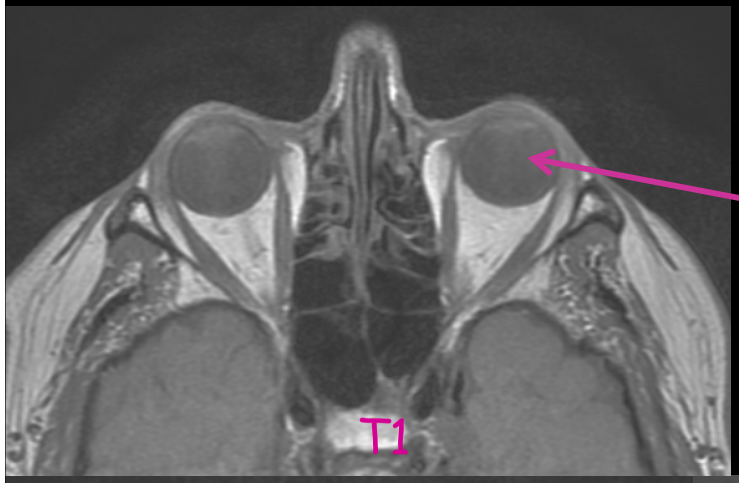
MR protokoll

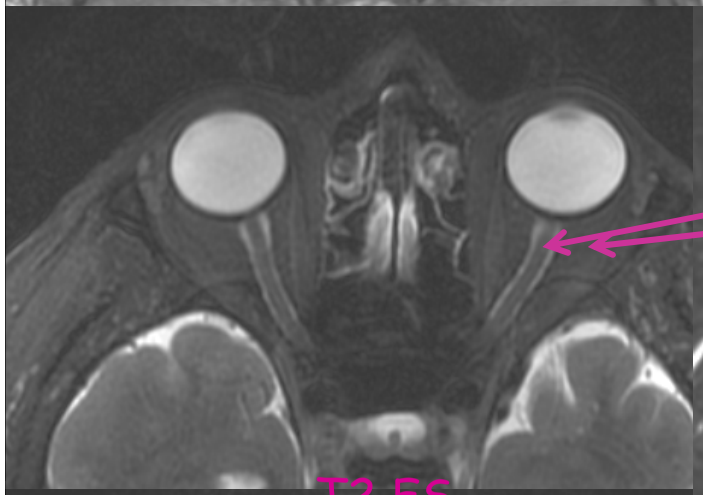
- Kitsas kiht 3 mm
- Väike FOV 12-16 cm

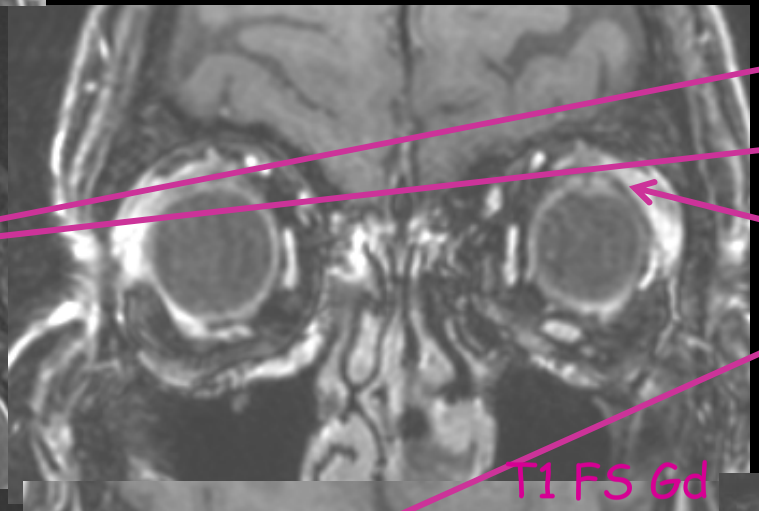
- T1 ax, cor
- STIR/T2 FS ax, cor
- DWI
- T1 Gd FS ax, cor
- 3D T1 Gd

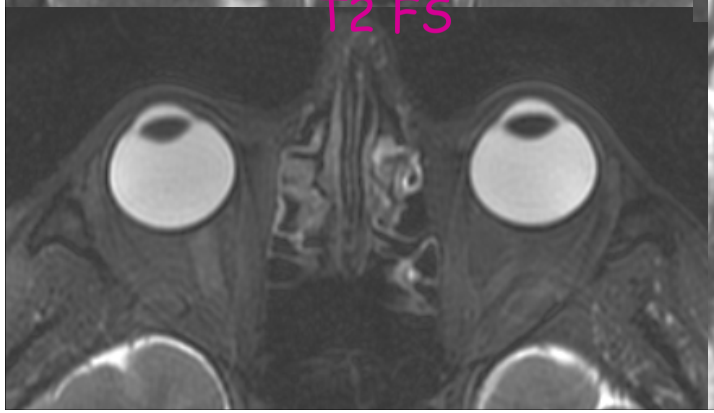


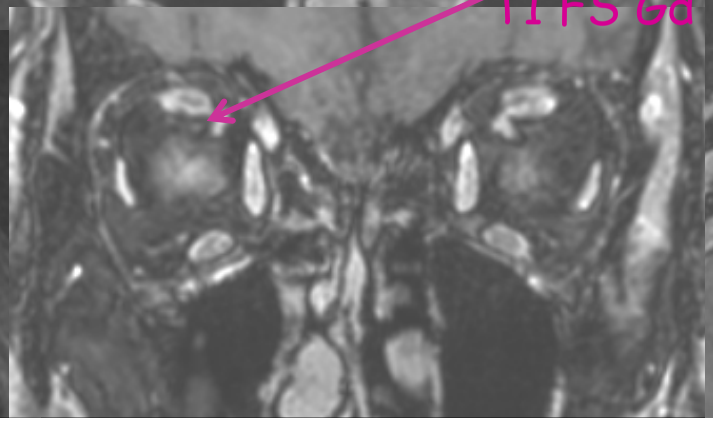
Silmakoobas

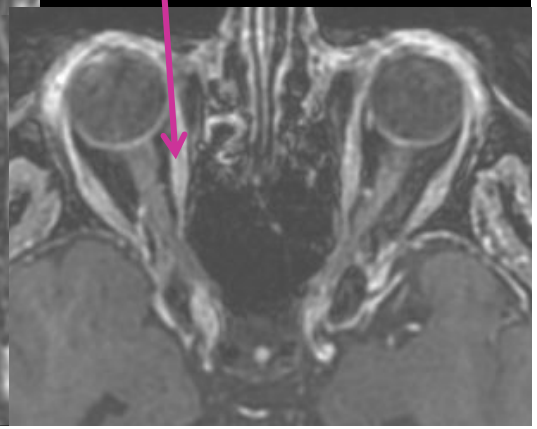








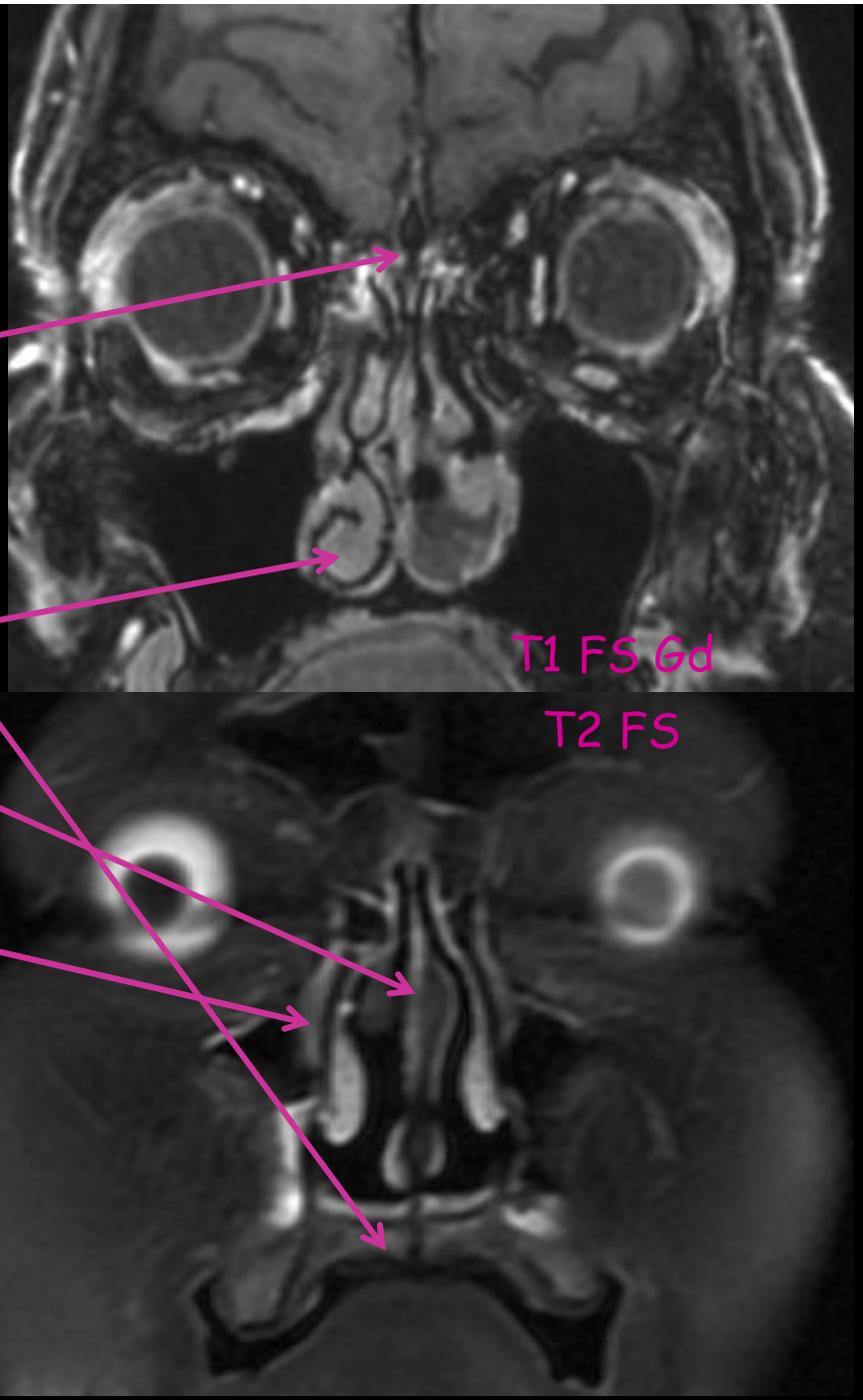




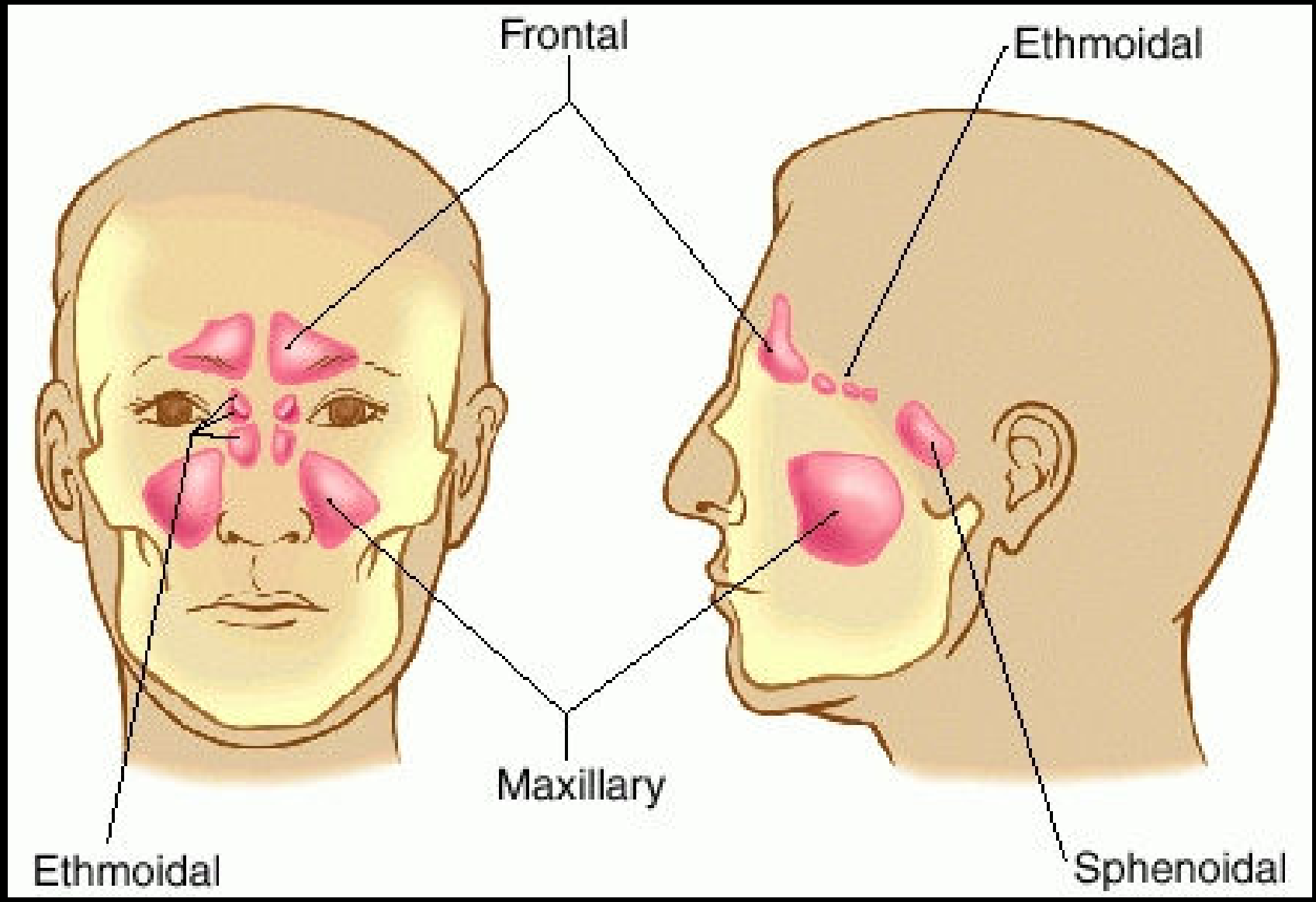
- Silmamuna
- Lihased (7)
- Nägemisnärv
- Orbita rasv
- Pisaranääre
- Arter ja veen
- Pisarakanal

Ninaõõs

- Cribriform plaat
- Kõva ja pehme suulagi
- Ninavahesein
- Karbikud
- Pisarakott

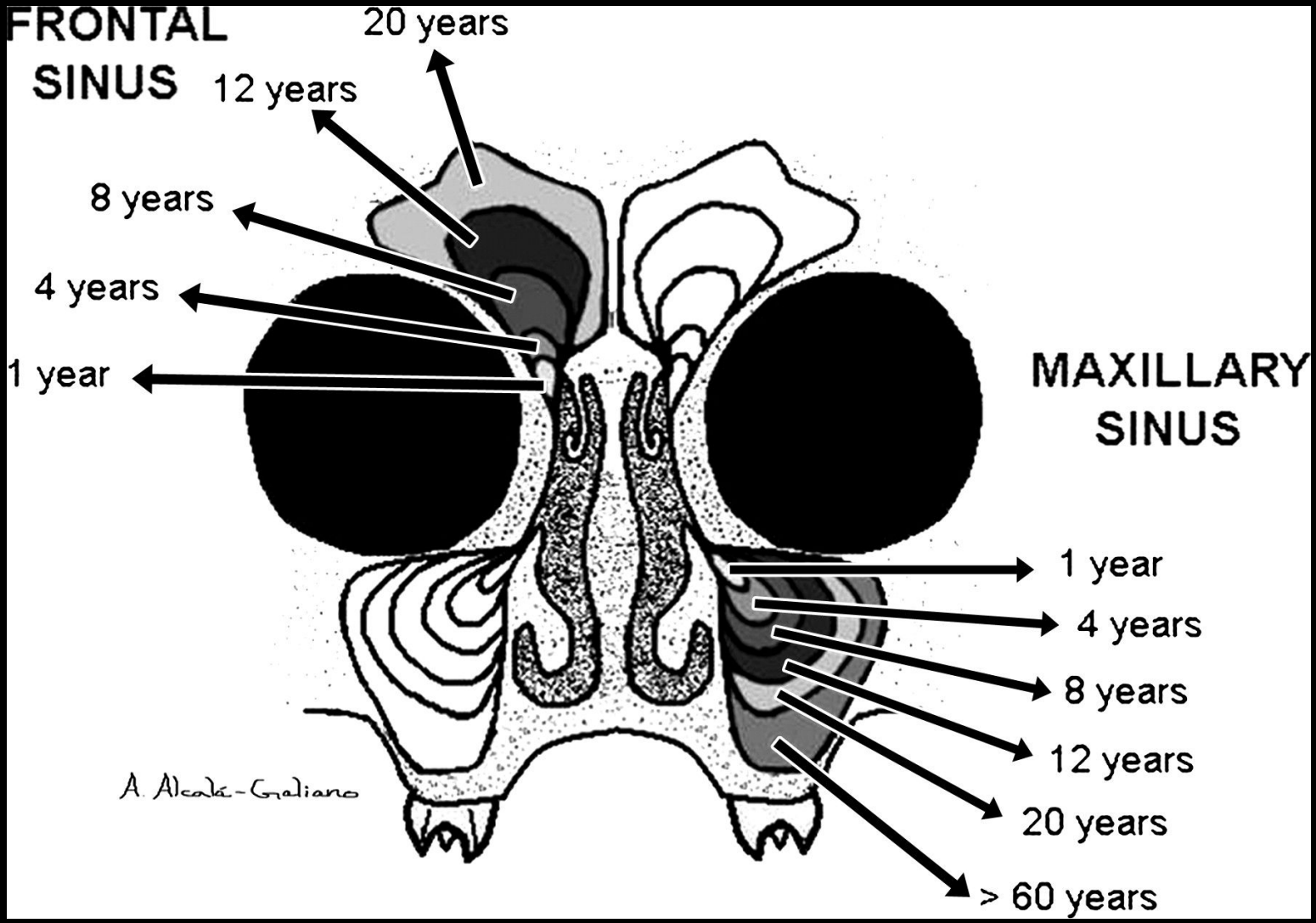


Ninakõrvalkoopad NKK



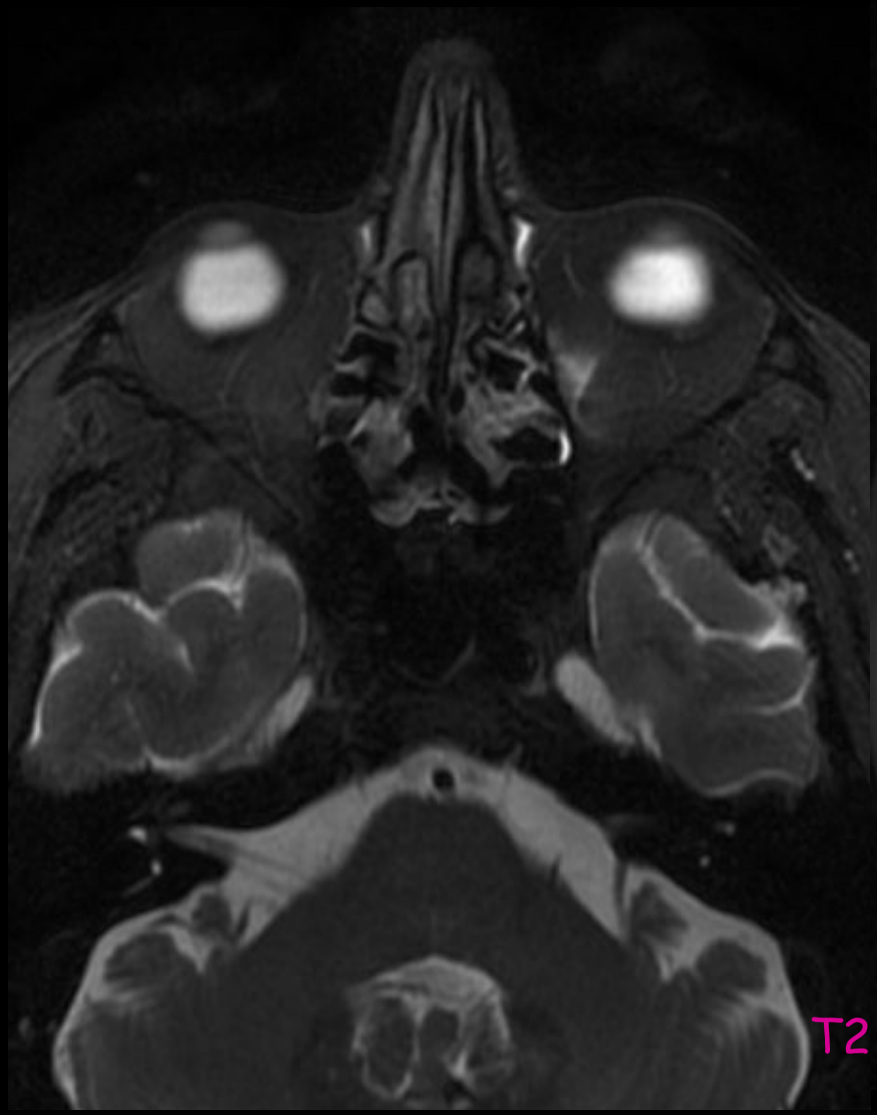
Alcalá-Galiano A et al. Radiographics 2008;28:441-461

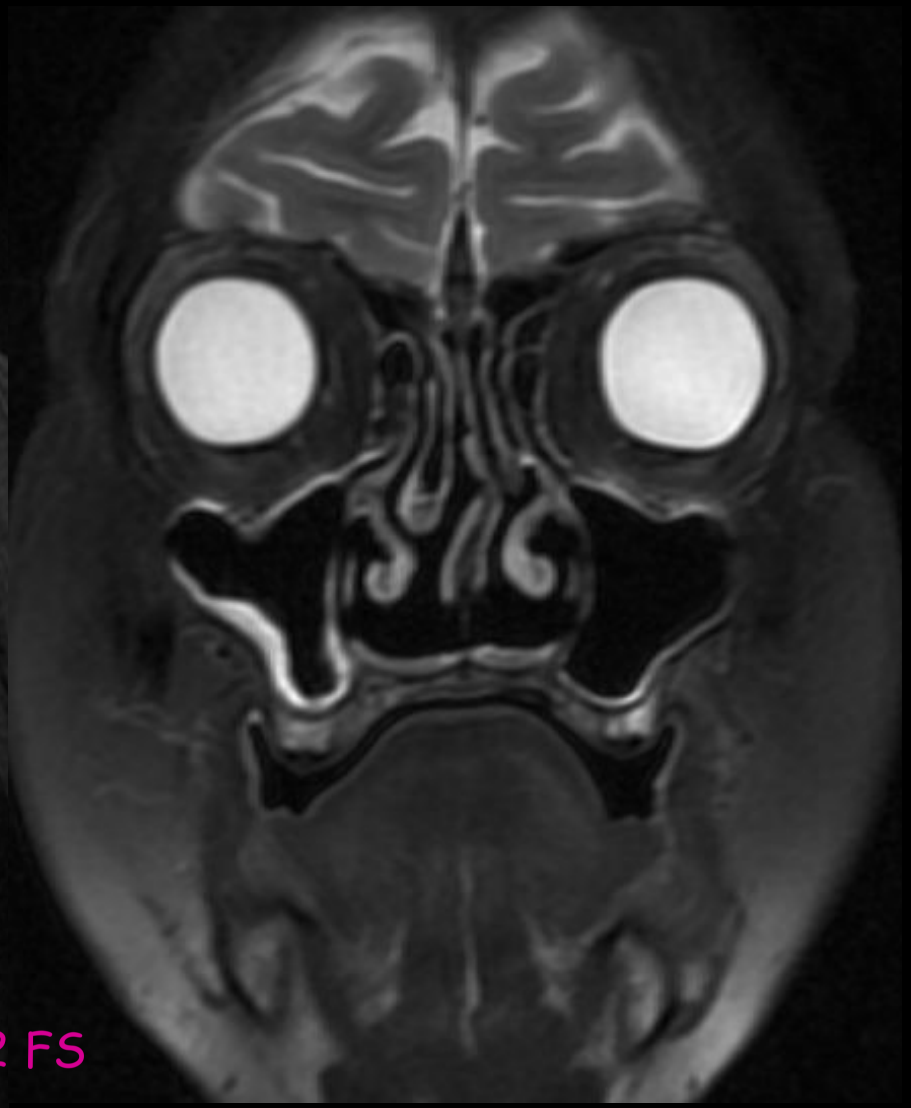
NKK areng



Alcalá-Galiano A et al. Radiographics 2008;28:441-461

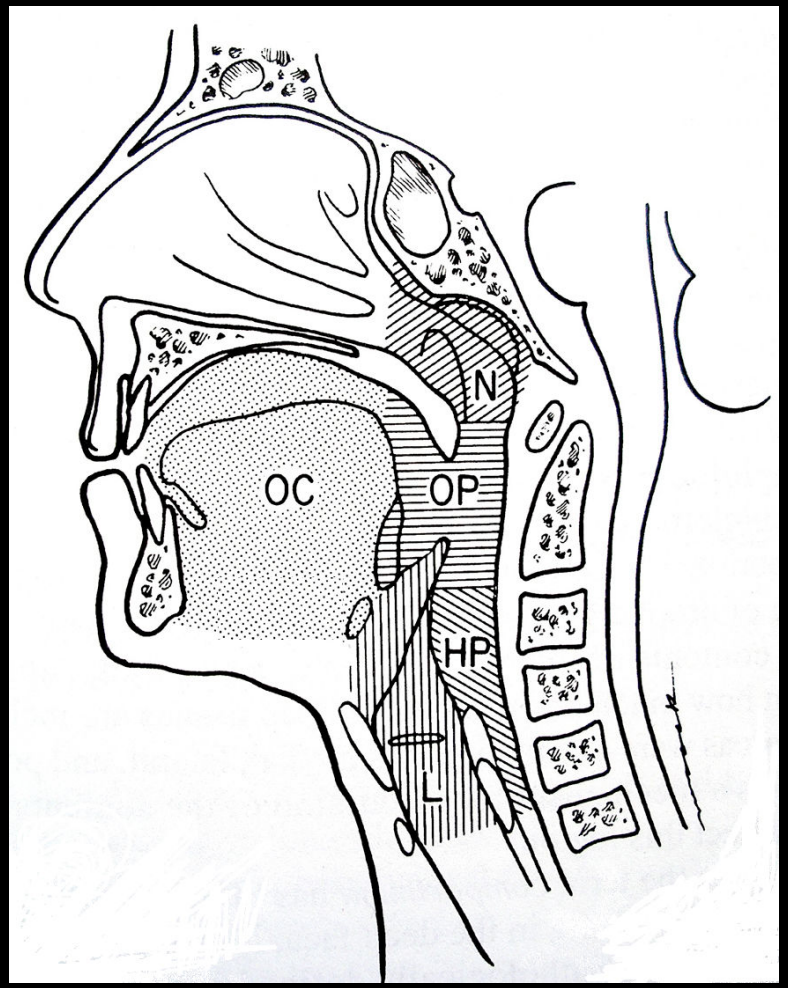
NKK

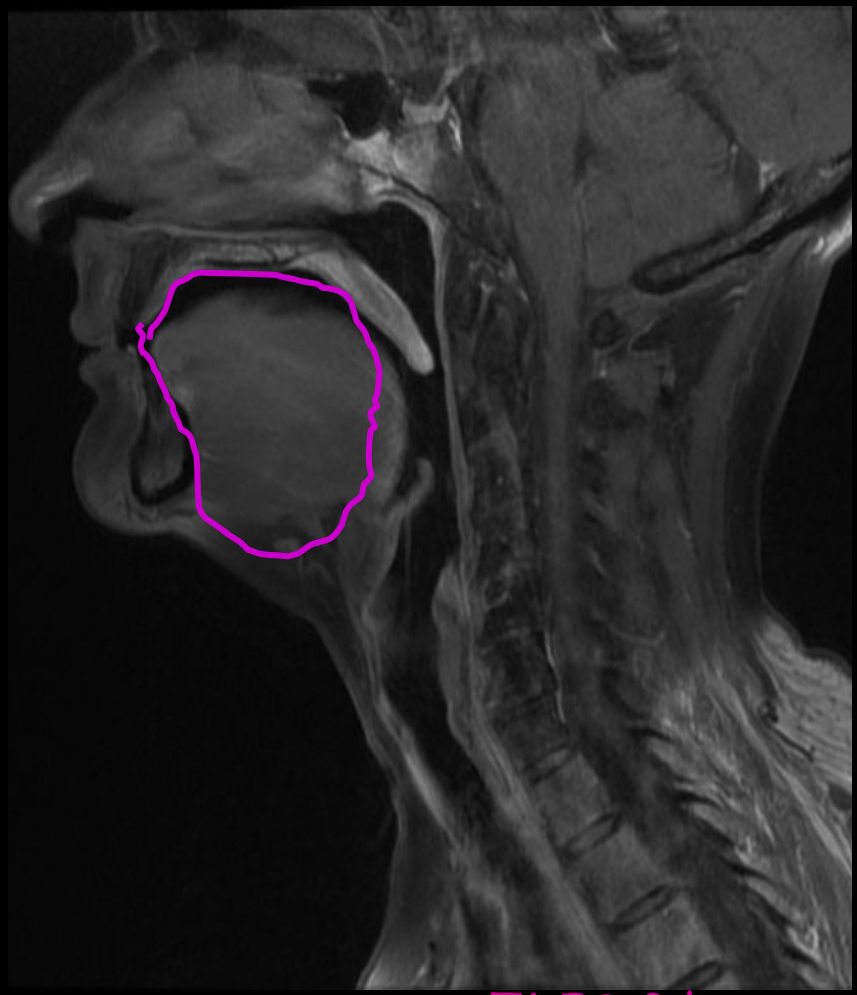




T2 FS

Suuõõs

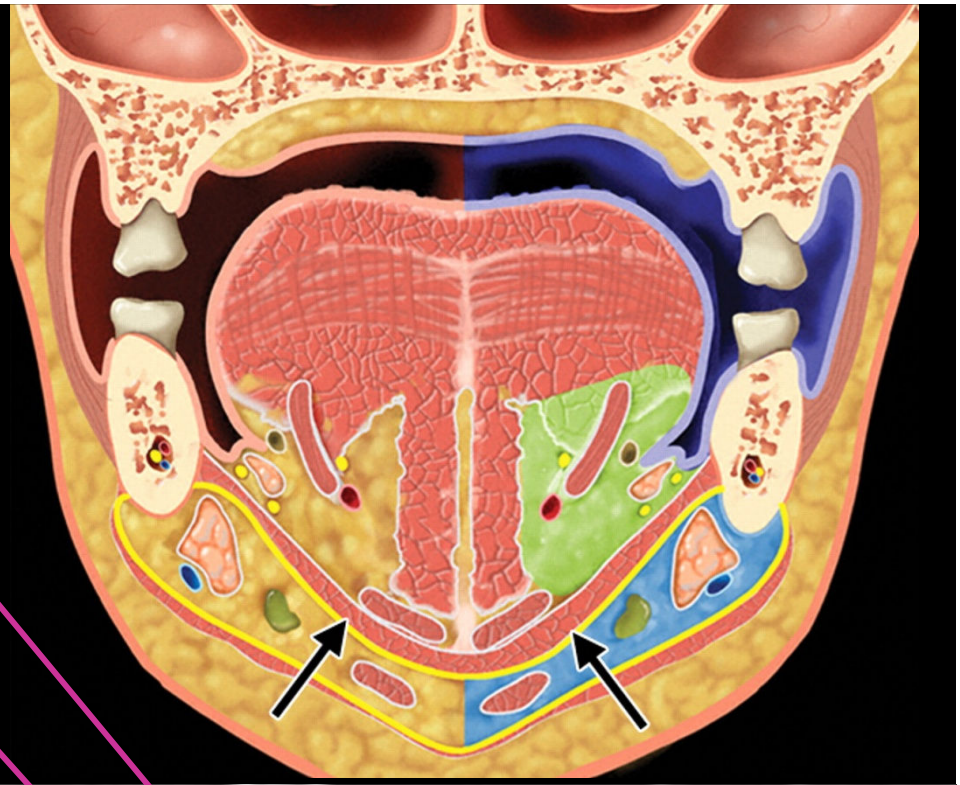


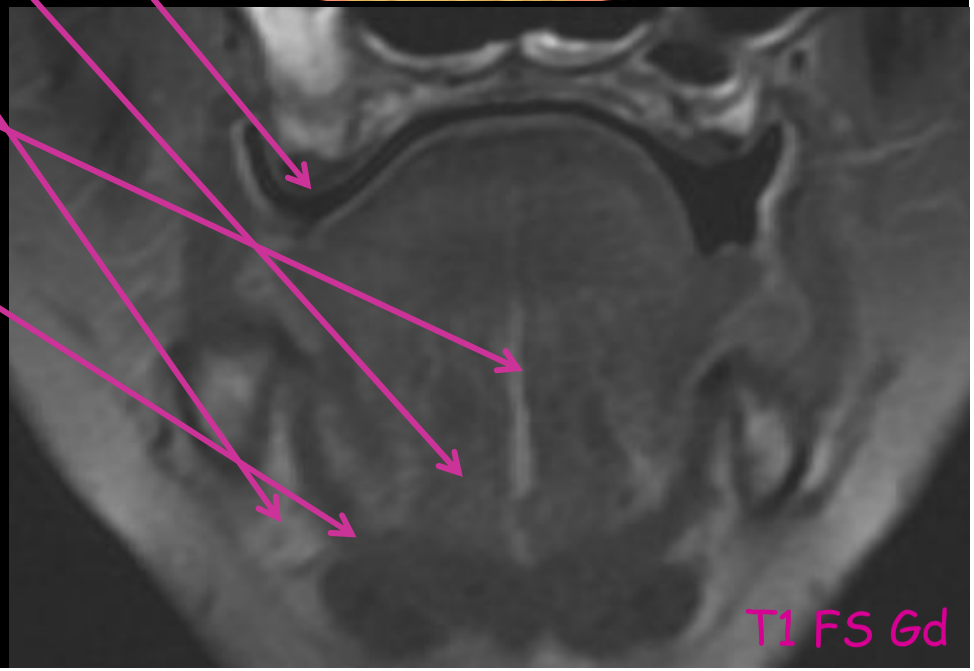


Suuõõs

- Suuõõne limaskest, keel
- Keelealune ruum SLS
- Submandibulaarruum SMS
- Keele juur ROT

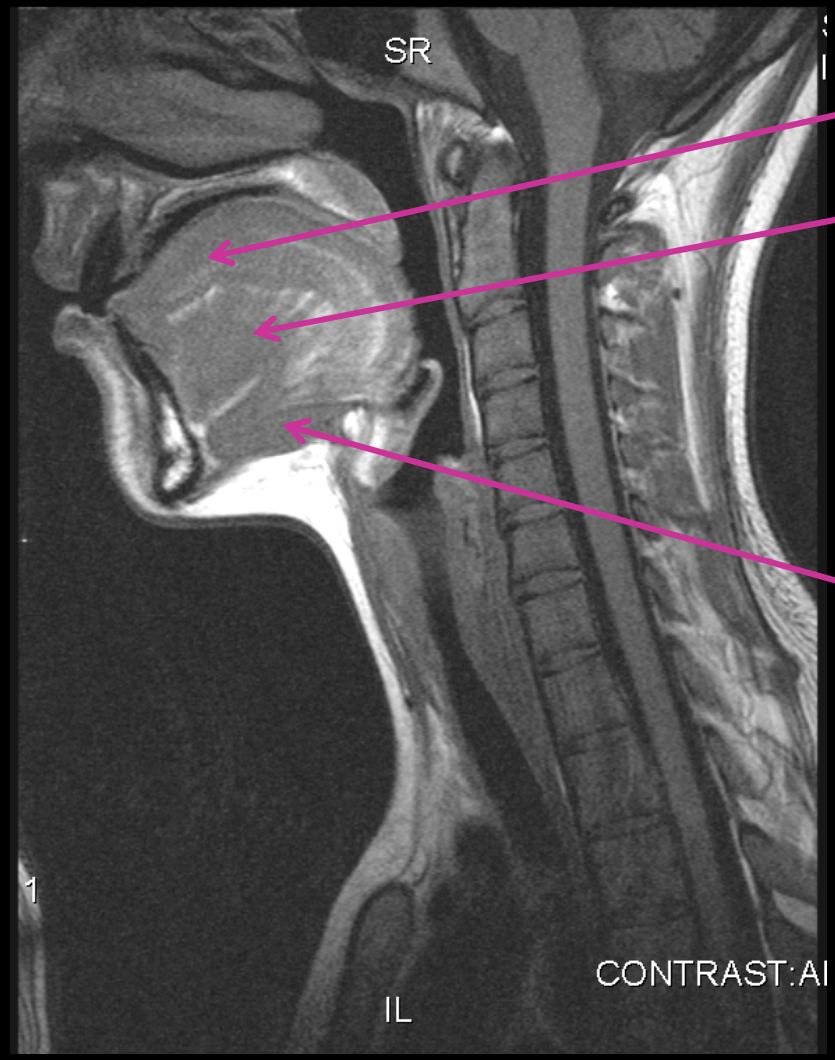
- **M. Myelohyoideus**





Trotta B M et al. Radiographics 2011;31:339-354

Suuõõs

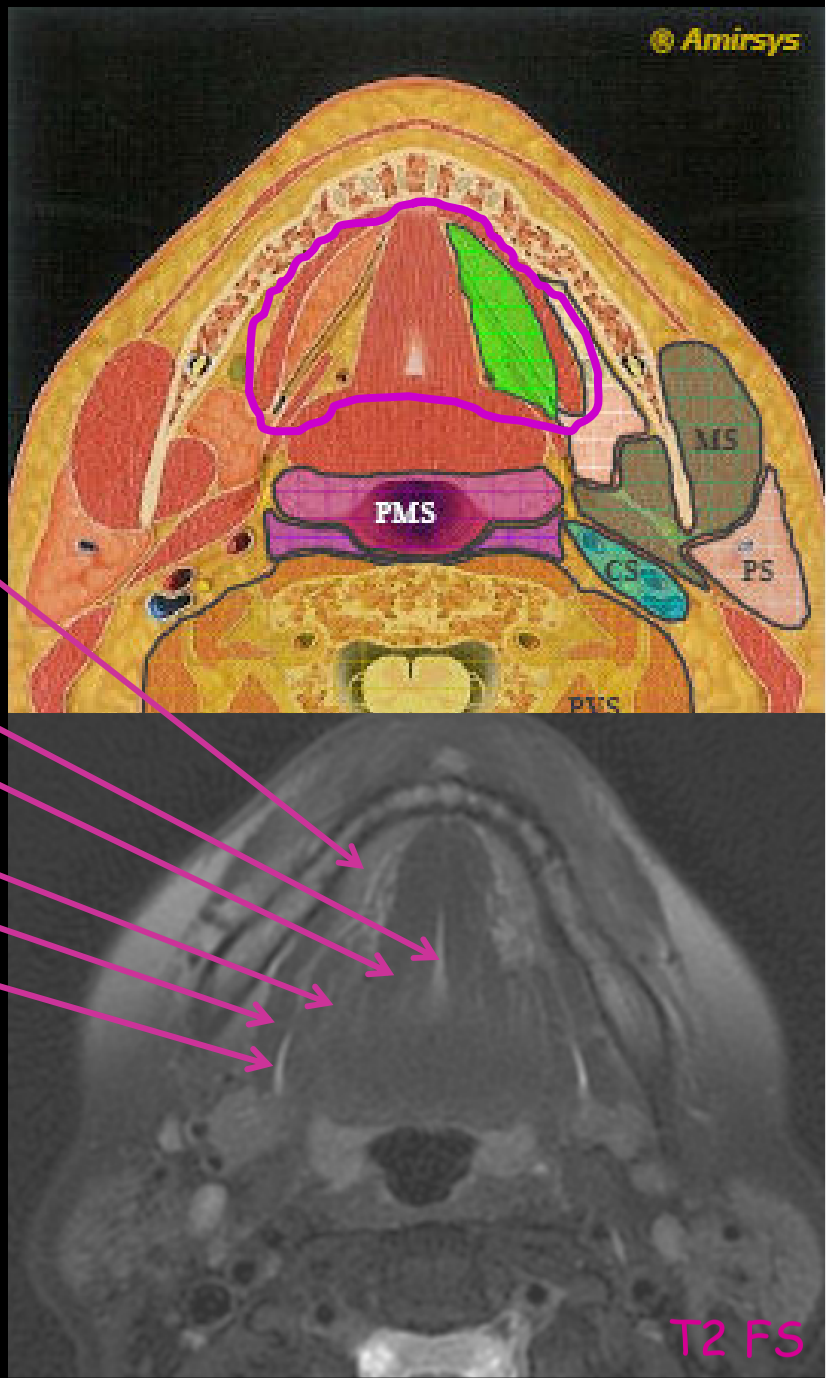


T1 FS Gd

- Keele sisemised lihased
- Keele välised lihased:
  - M. genioglossus
  - M. styloglossus
  - M. hyoglossus
- Keele juur
  - M. genioglossus
  - M. geniohyoideus
- Keelepära kuulub suuneelu juurde

Keelealune ruum
SLS Sublingual Sp

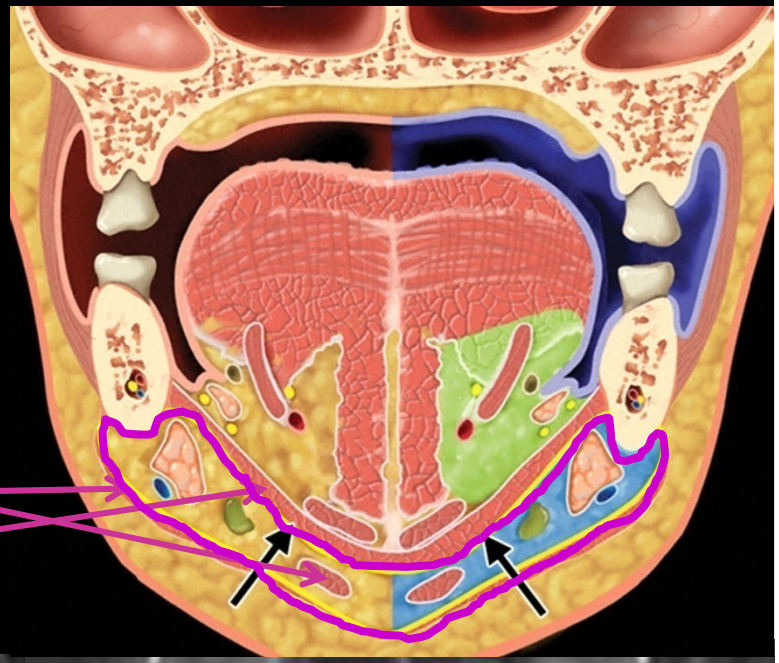
- Keelealune süljenääre
- Keele vahesein
- M. Genioglossus
- M. Hyoglossus
- M. Mylohyoideus
- Submandibulaarnäärme juha

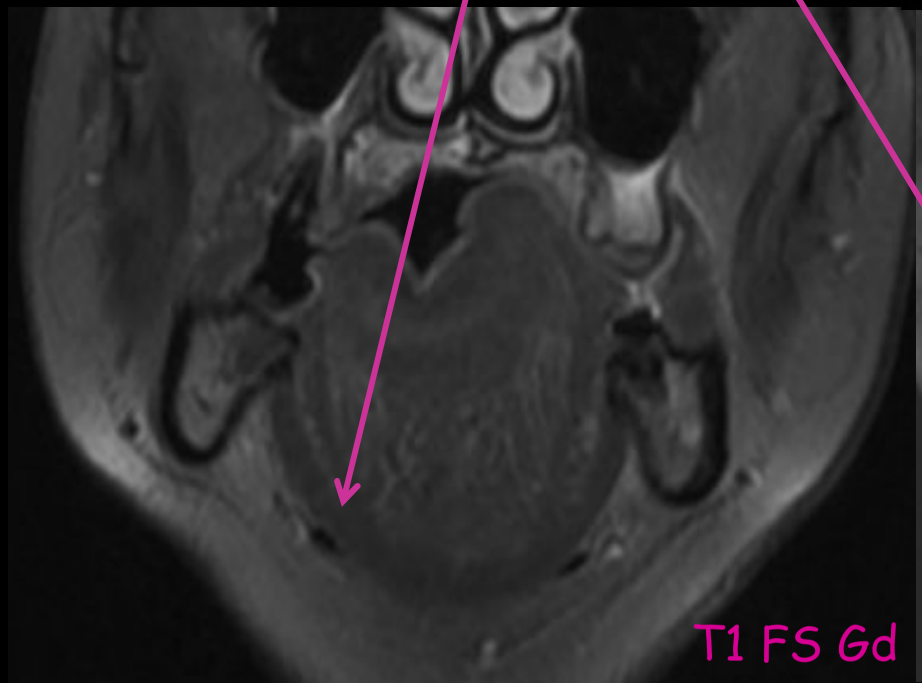


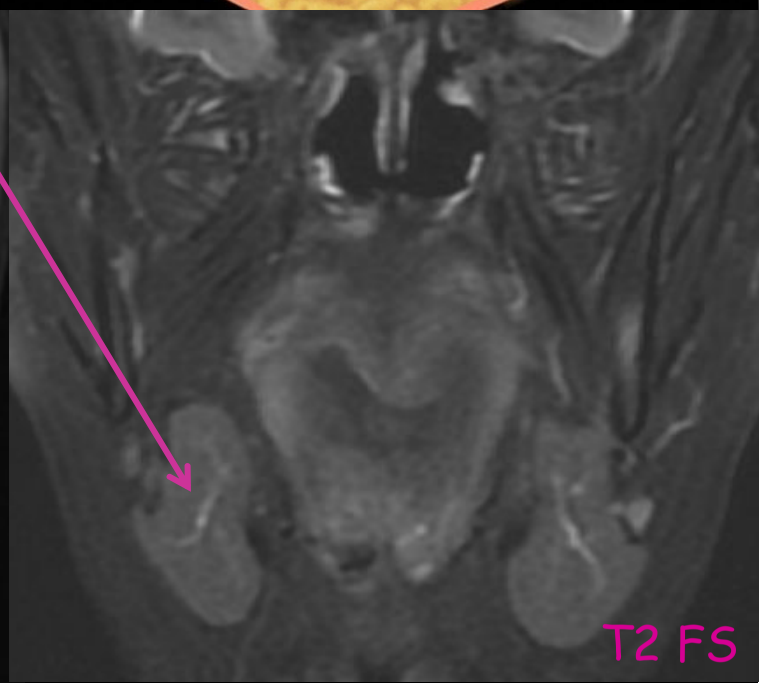
Submandibulaarruum

SMS Submandibular Sp

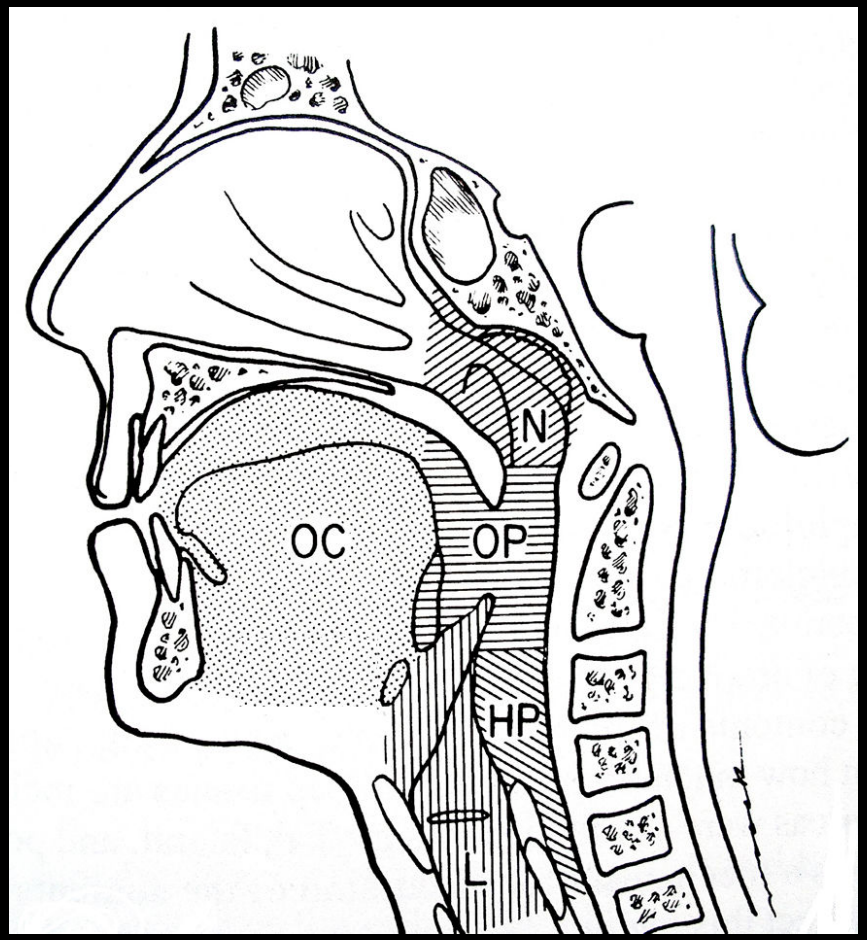
- Submandibulaarnääre
- M. Digastricus
- Platysma
- M. Mylohyoideus

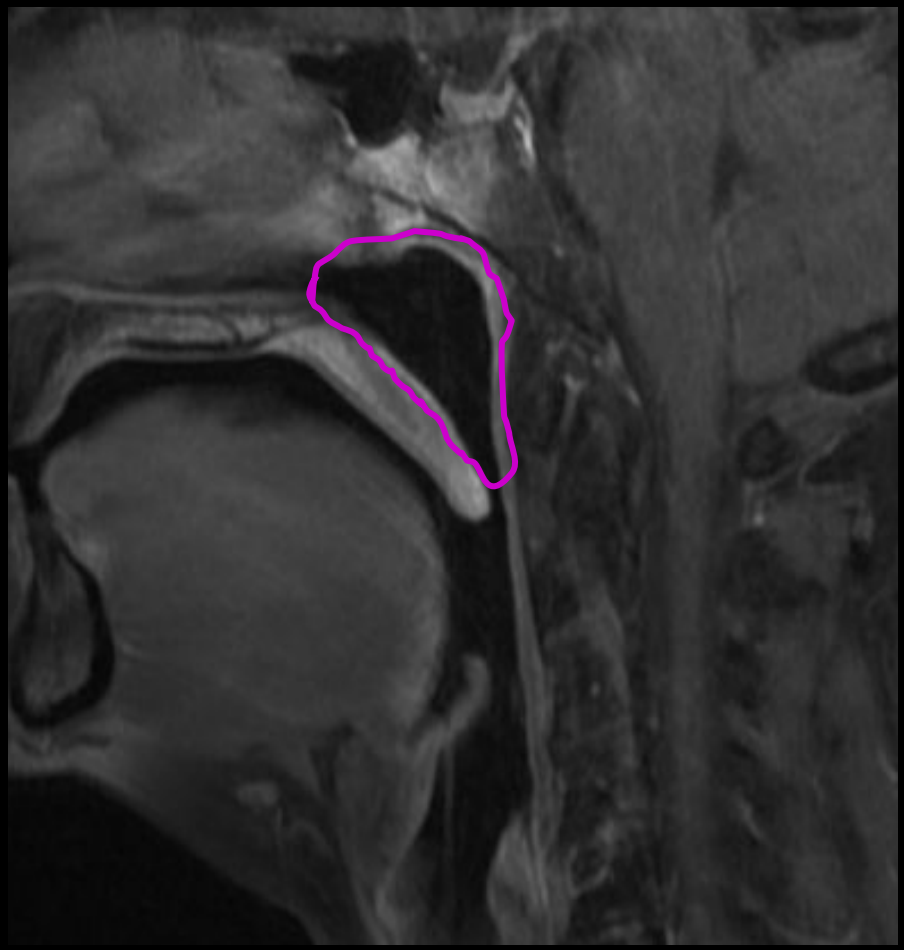






Ninaneel

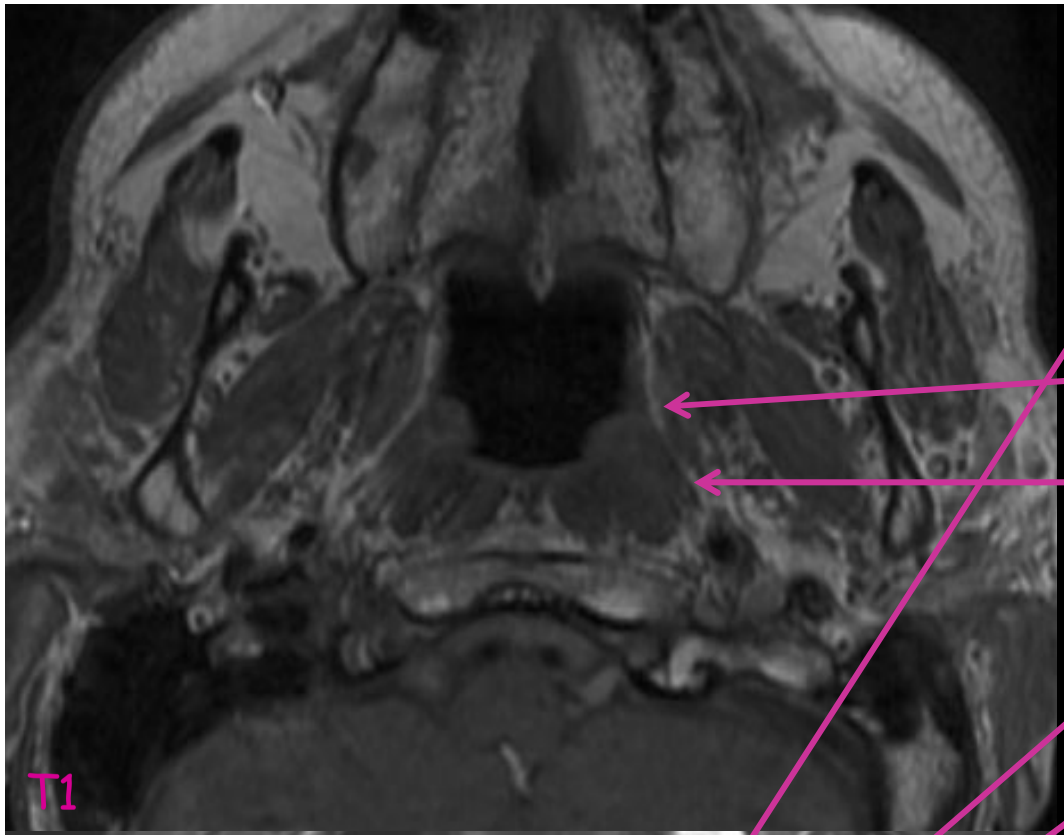


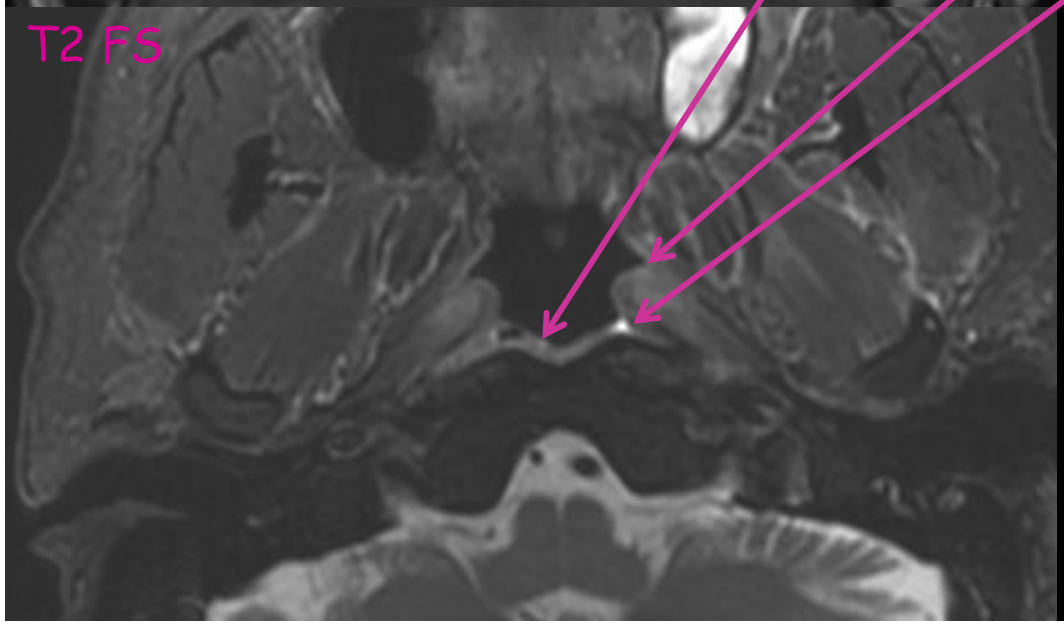


T1 FS Gd

ERASMUS Head and Neck 2011

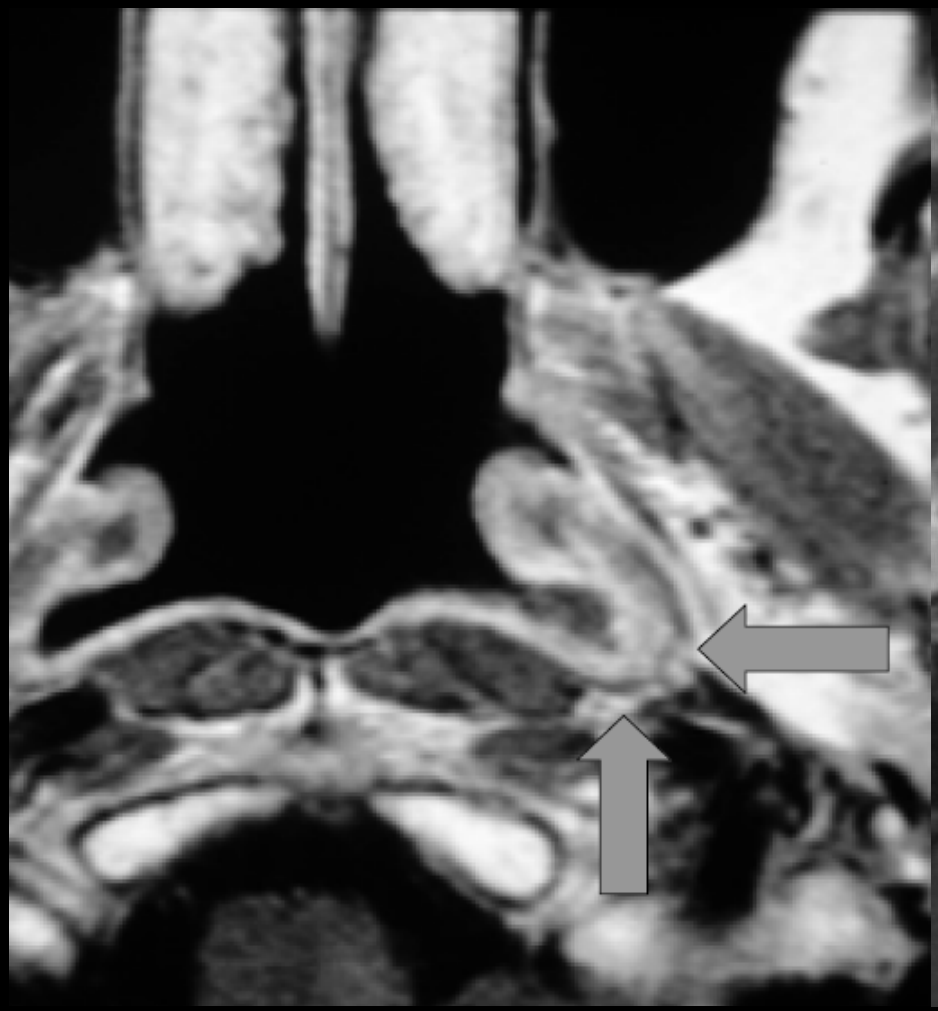
Ninaneel



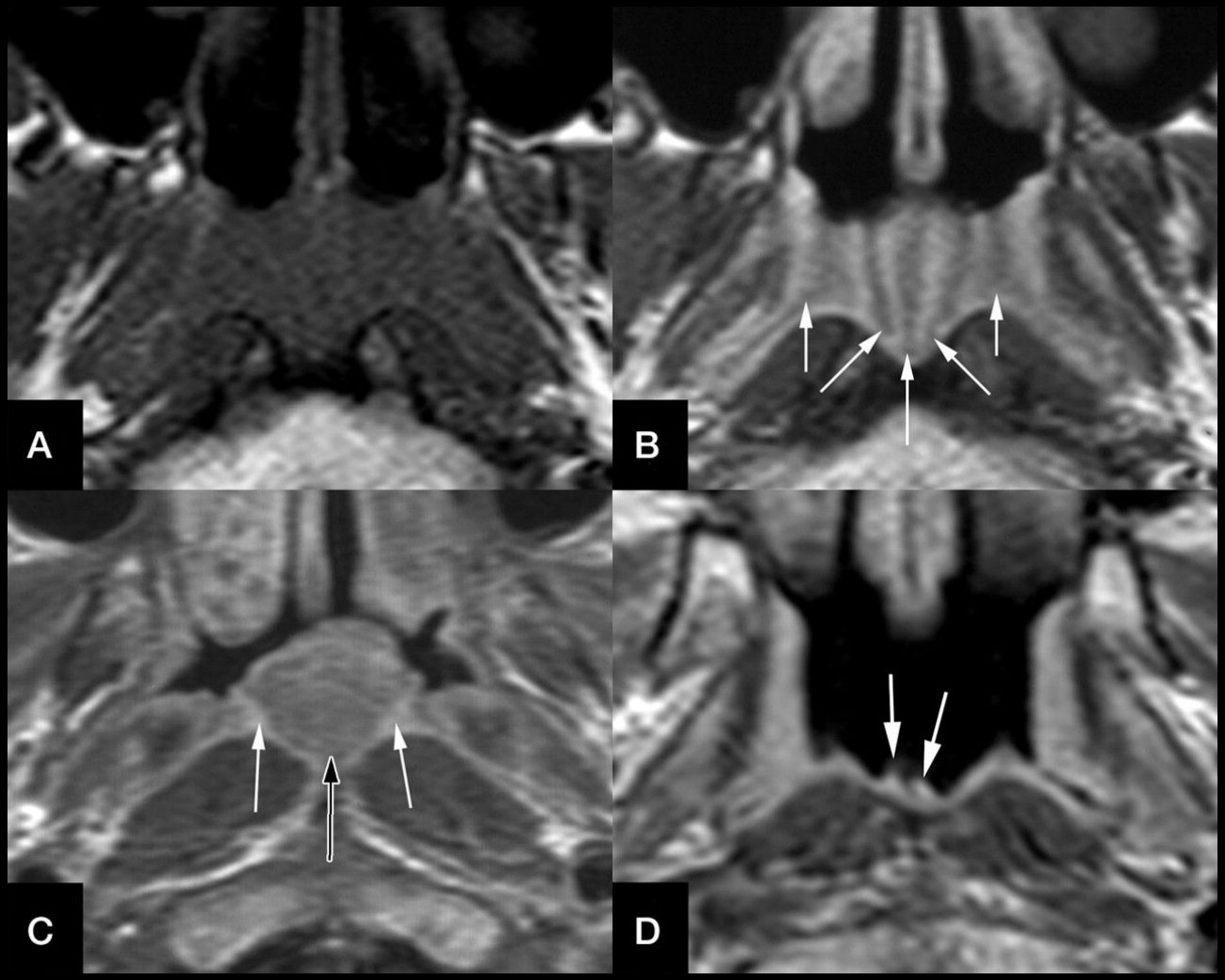


- Lümfoidkude
- M. tensor veli palatini
- Kuulmetõri kõhreline osa
- Kuulmtõri avaus
- Rosenmülleri ava e. lateraalne neelu retsess

Foramen Rosenmülleri



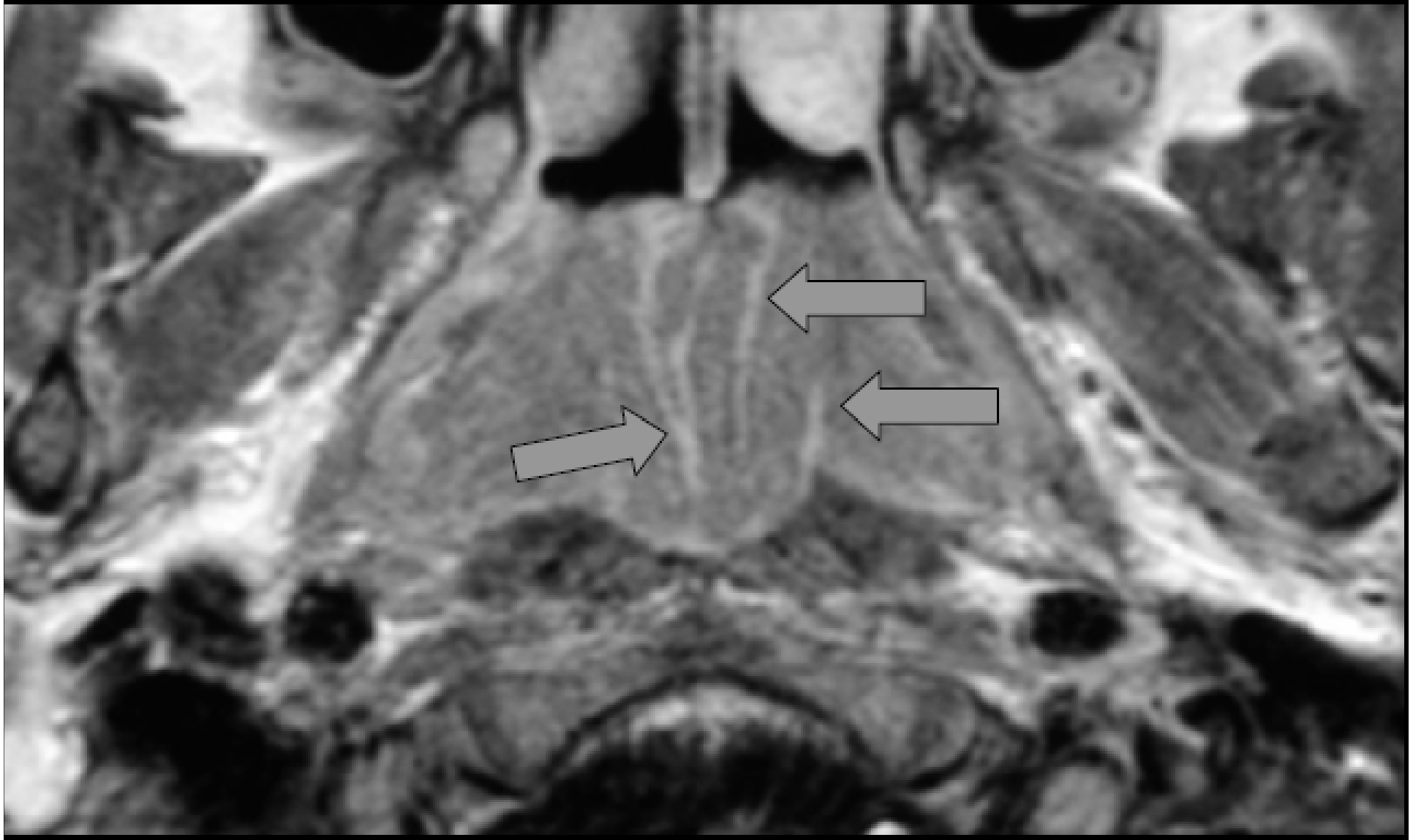
Ninaneelu lümfoidkude



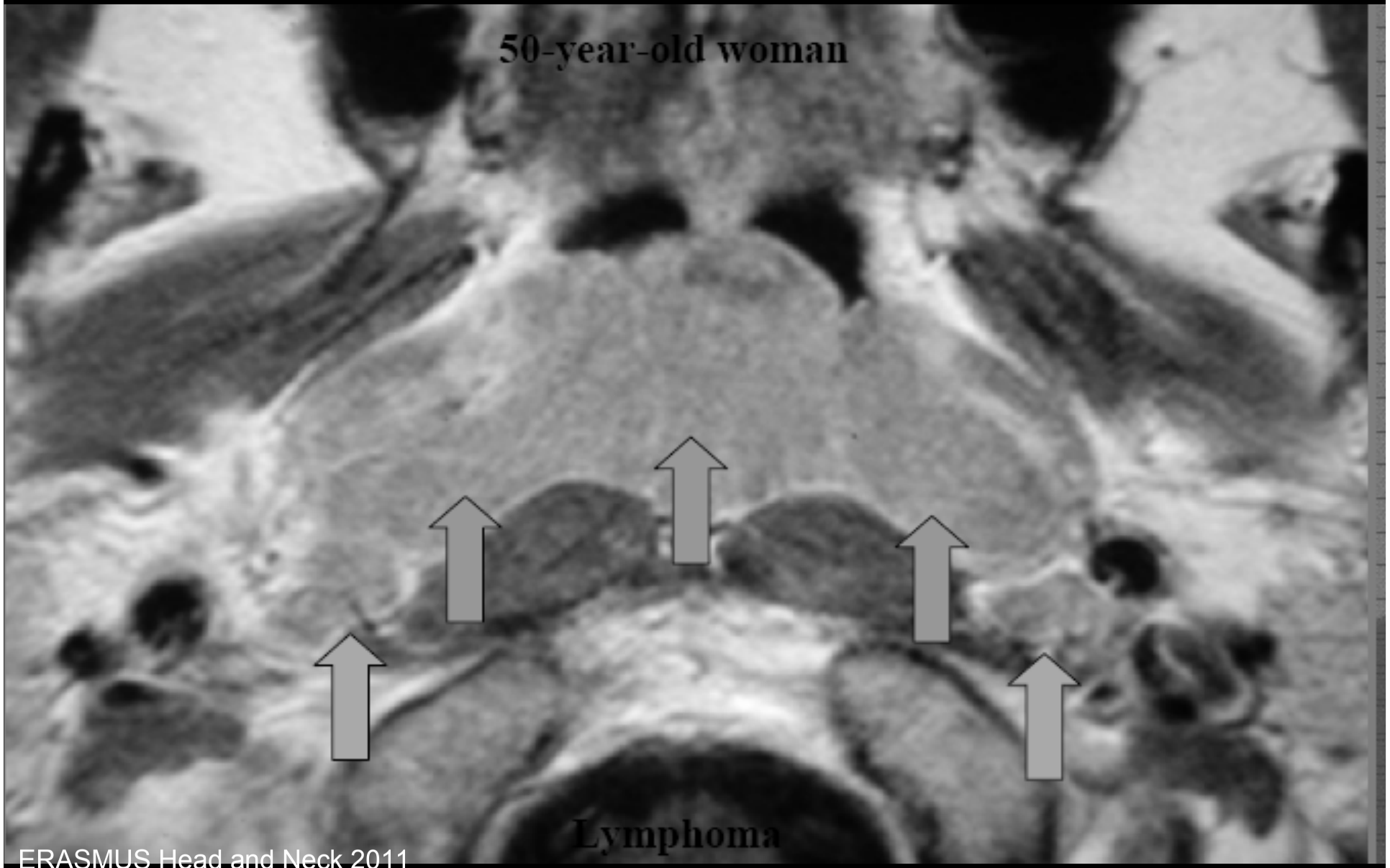
- T1 pre ja post Gd
- Adenoidi jääk

Bhatia K S S et al. Radiology 2012;263:437-443

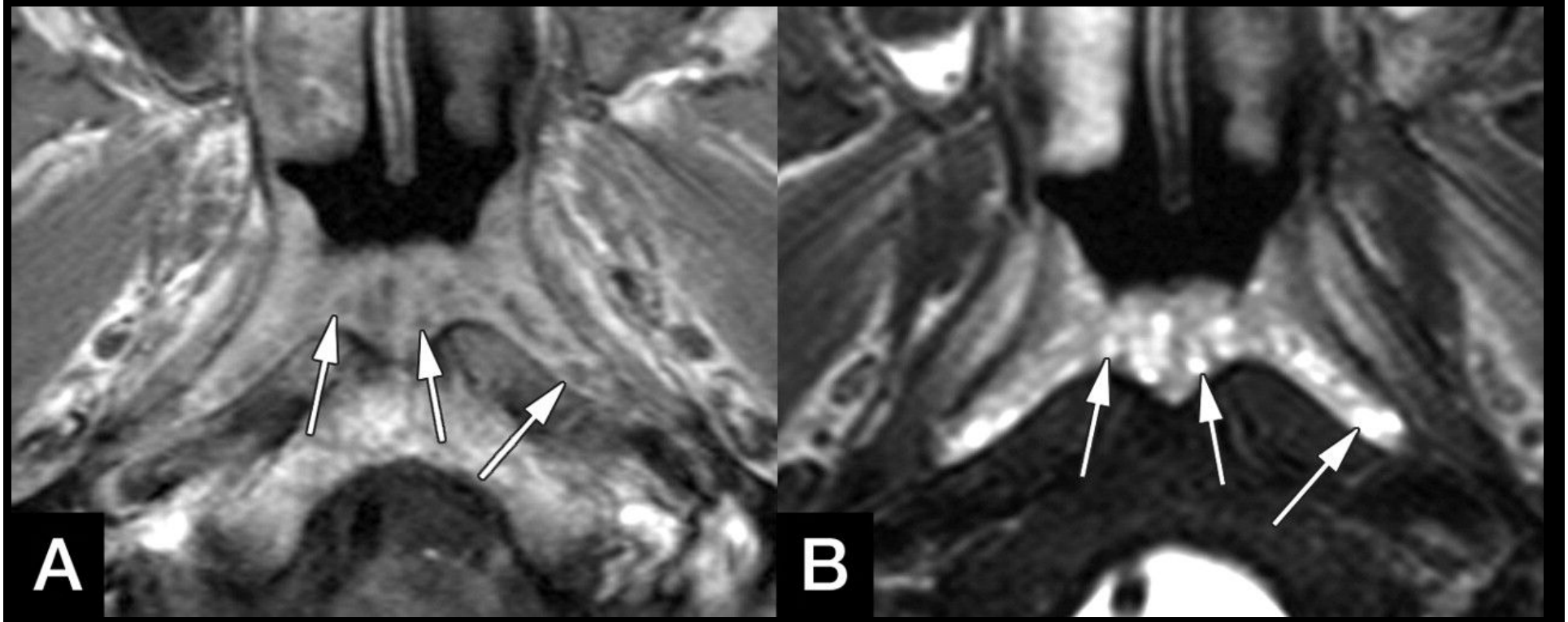
II Defonso sign – normaalne adenoid



Lümfoom

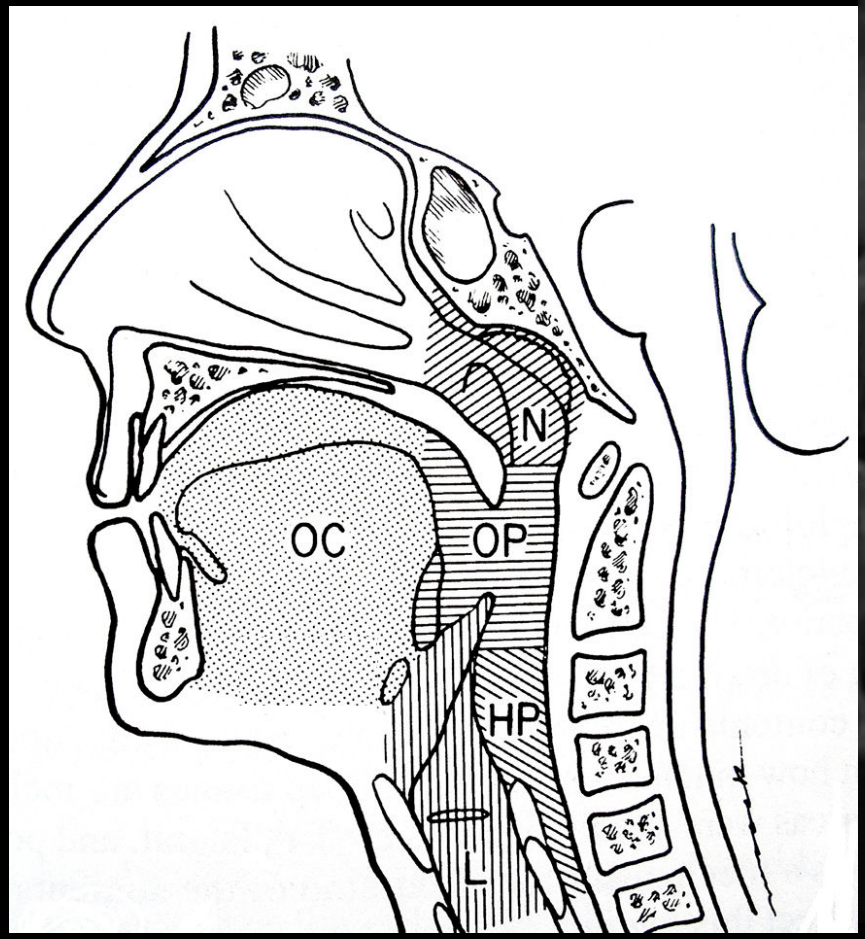


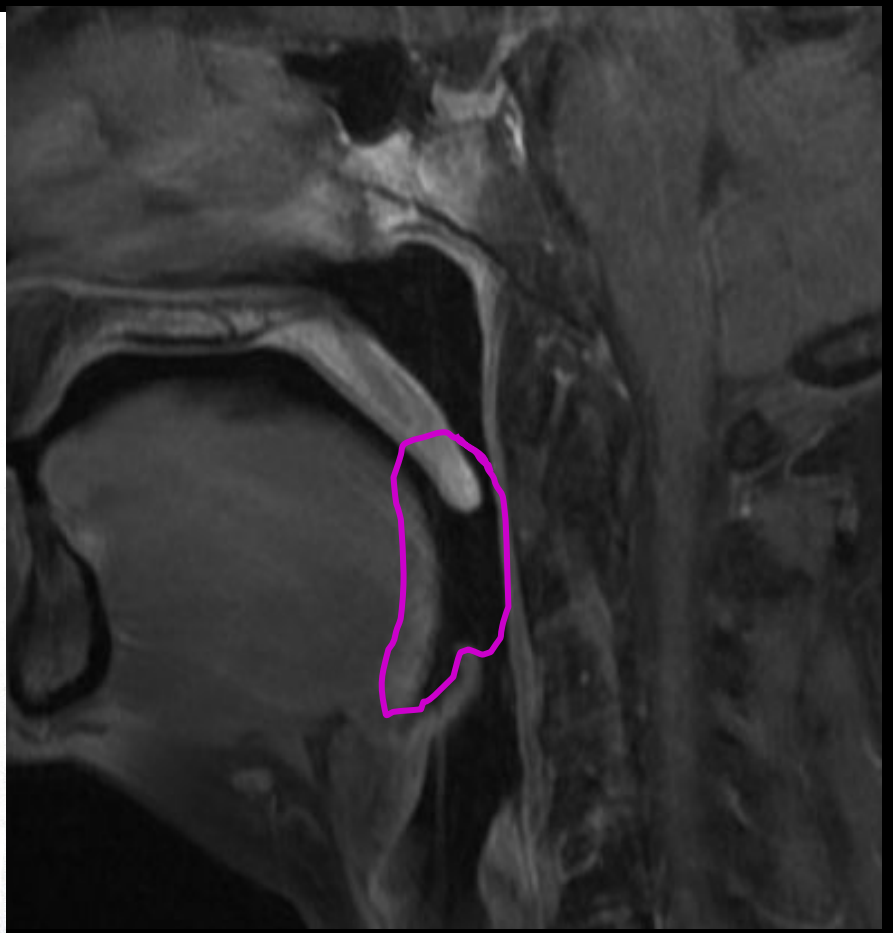
Retensioonitsüstid



Bhatia K S S et al. Radiology 2012;263:437-443

Suuneel

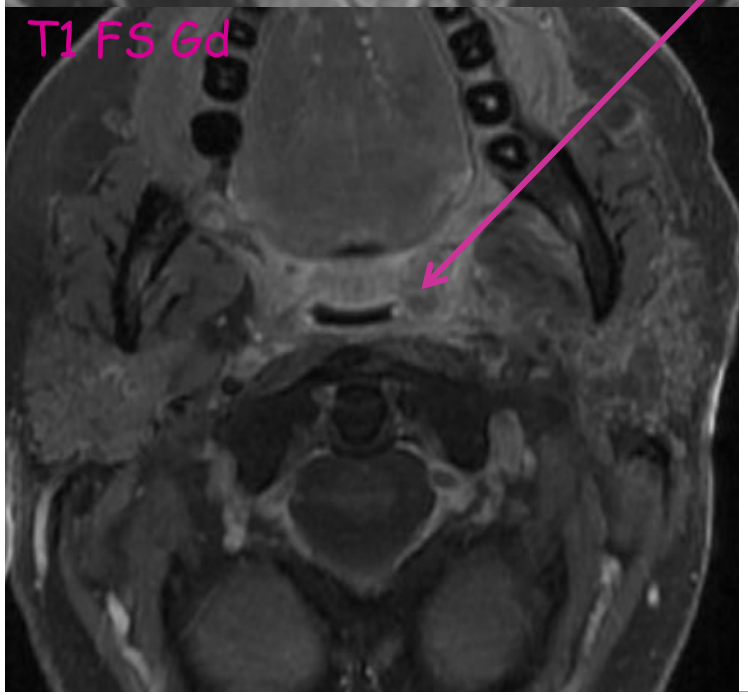


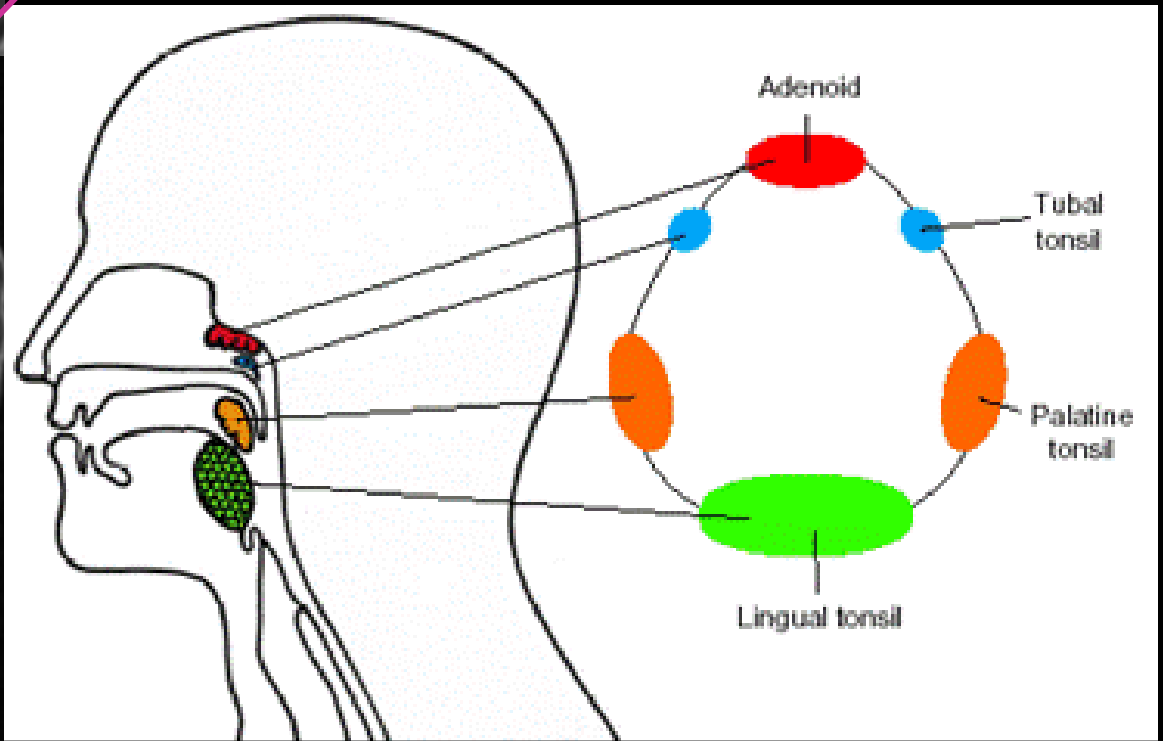


T1 FS Gd

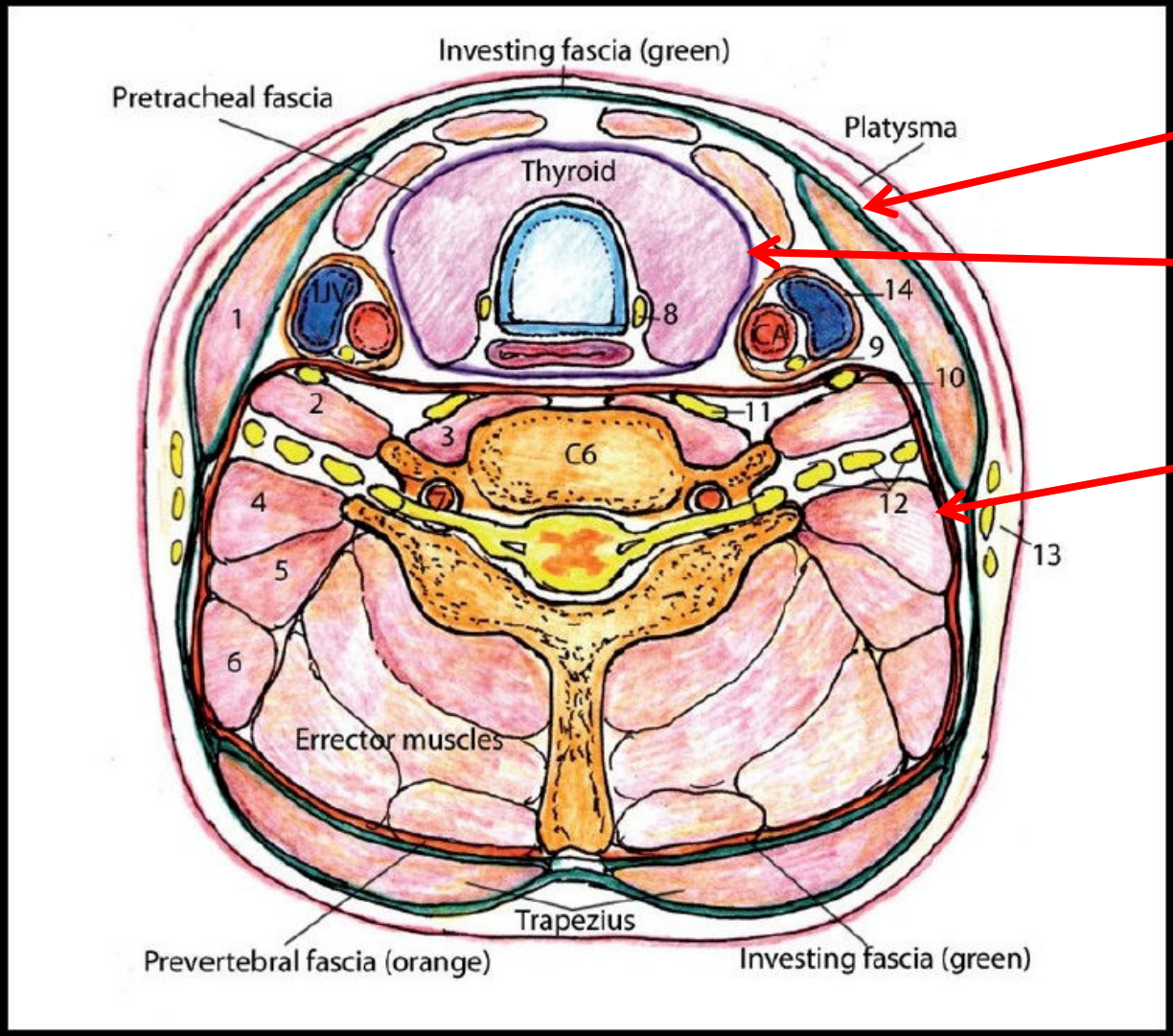
Suuneel

- Pehme suulagi
- Keelepära
- Lümfoidne kude Waldeyer‘i ring





Kaela ruumid - süva fastsiad



Pindmine fastsia

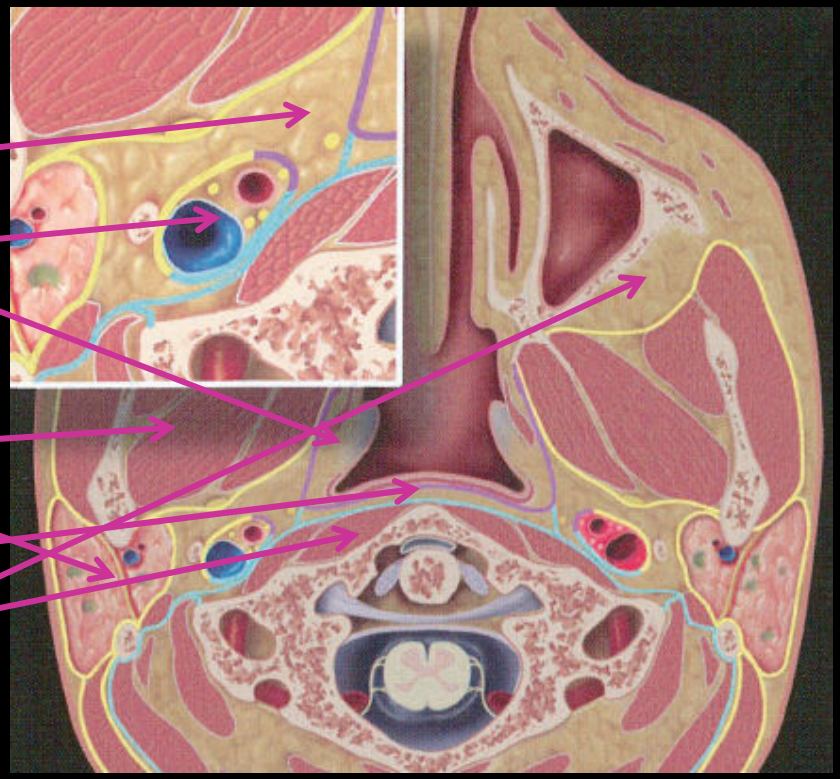
Keskmine fastsia

Süva fastsia

ERASMUS Head and Neck 2011

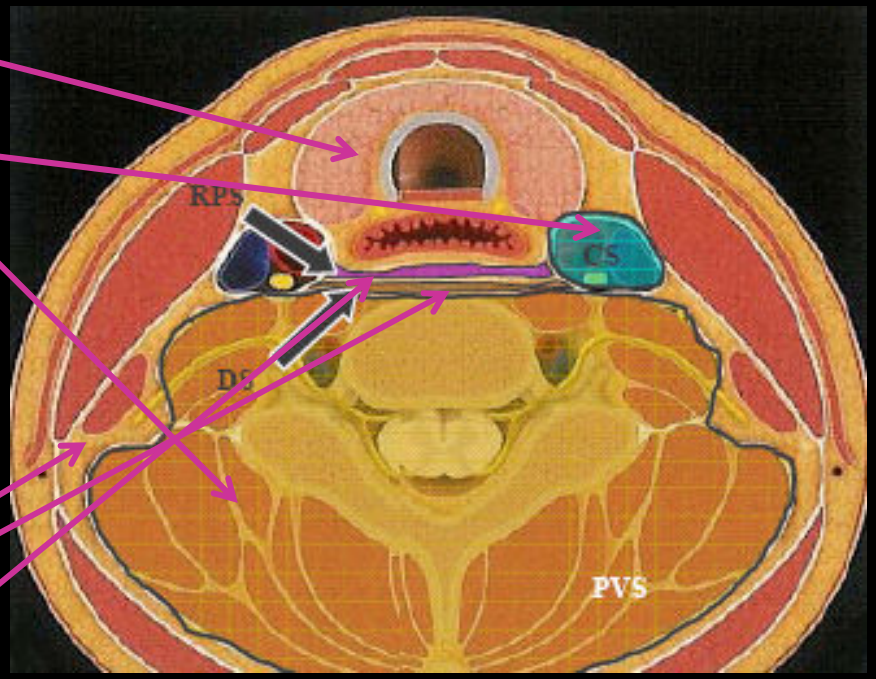
SHN – keeleluust üleval

- Neelu limaskestaalune ruum PMS
- Parafarüngeaalruum PPS
- Karootisruum CS
- Parootisruum PS
- Mastikaatorruum MS
- Retrofarüngeaalruum RPS
- Perivertebraalne ruum PVS
- Bukaalne ruum BS

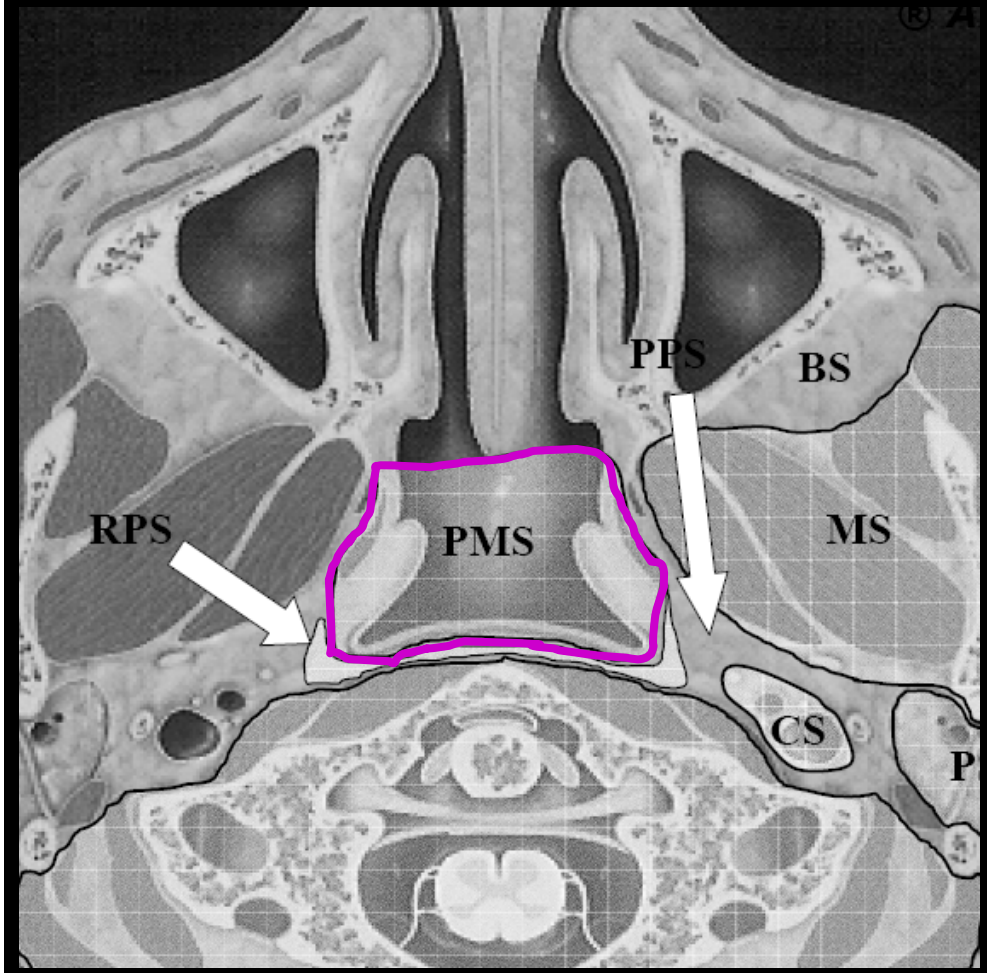


IHN – keeleluust all

- Organite ruum VS
- Karootisruum CS
- Perivertebraalruum PVS
  - Prevertebraalruum
  - Paraspinaalruum
- Tagumine kaela ruum PCS
- Retrofarüngeaalruum RPS
- Ohtlik ruum Danger Space



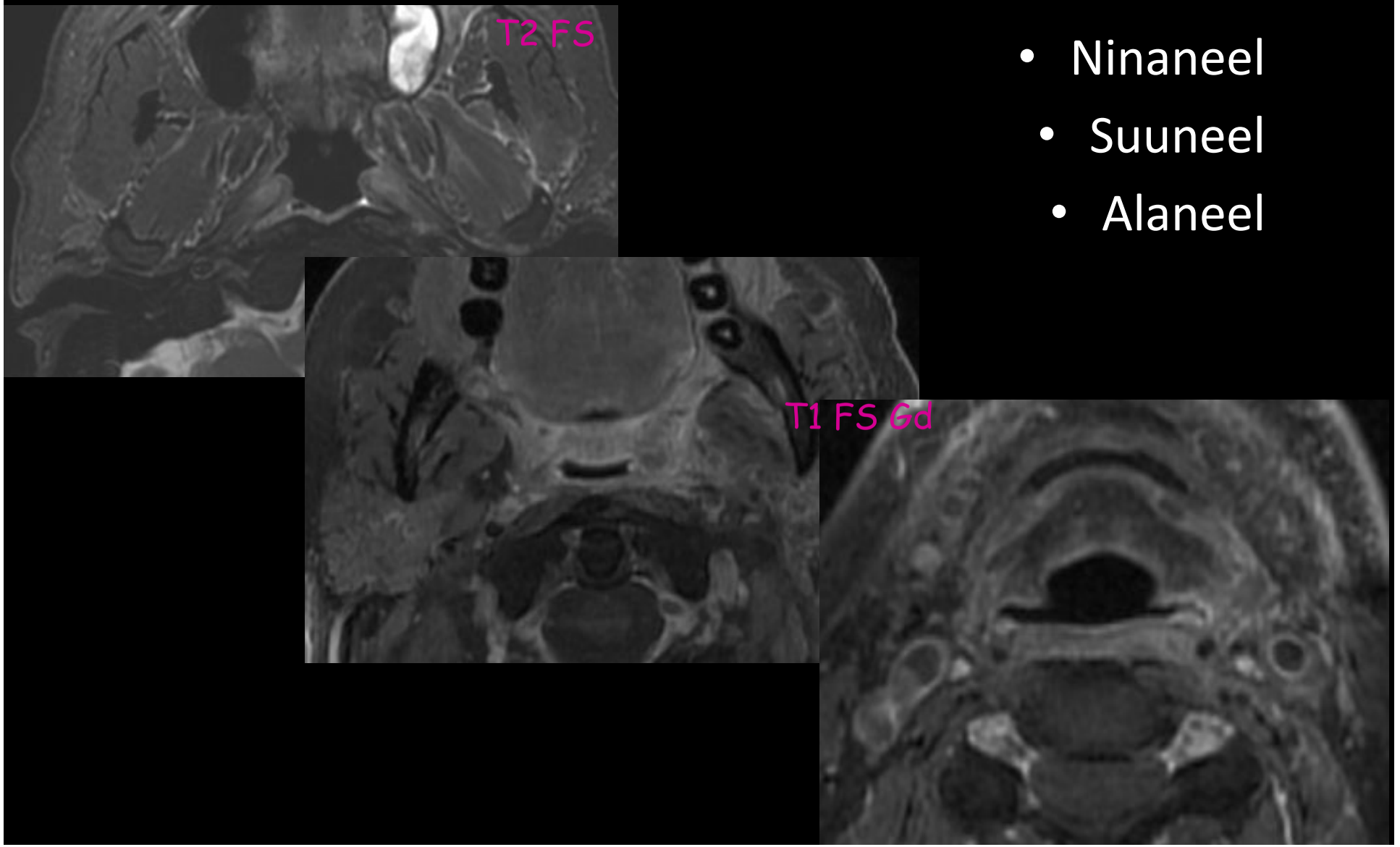
Neelu limaskestaalune ruum
PMS Pharyngeal Mucosal Sp



- Lümfoidkude
- Väiksed süljenäärmed
- Levaator palatini jt. lihased
- Kuulmetõri kõhreline osa

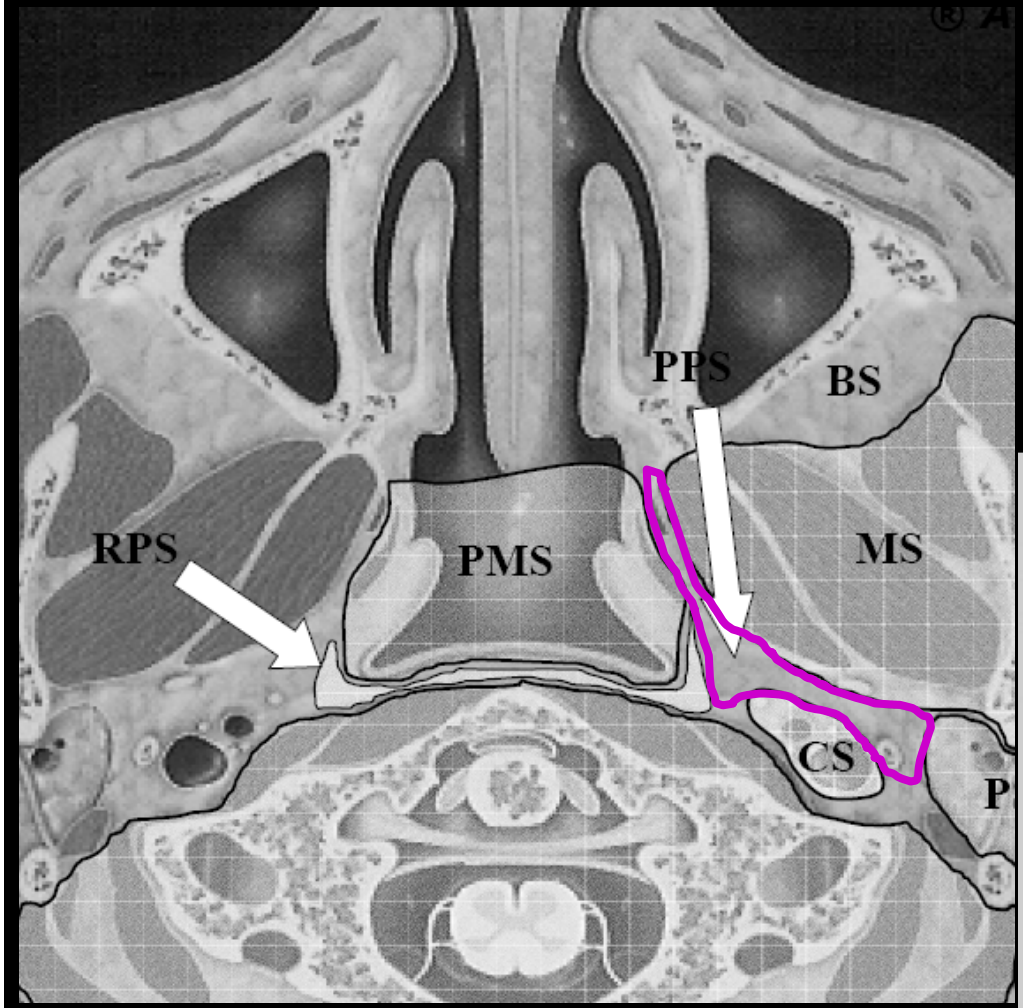
ERASMUS Head and Neck 2011

Neelu limaskestaalune ruum – **PMS**

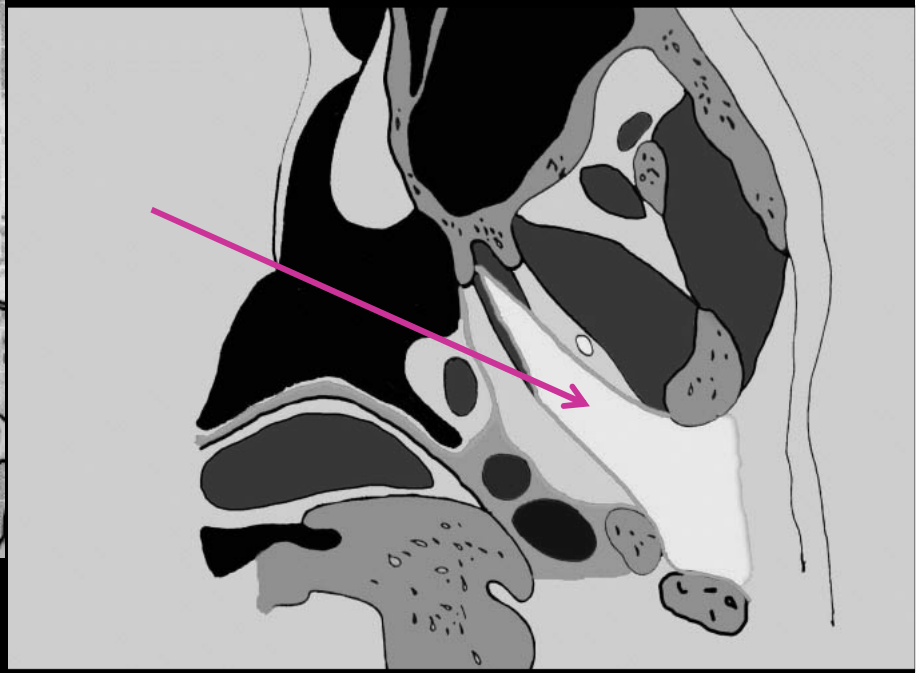


- Ninaneel
- Suuneel
- Alaneel

Parafarüngeaalruum
PPS Parapharyngeal Sp

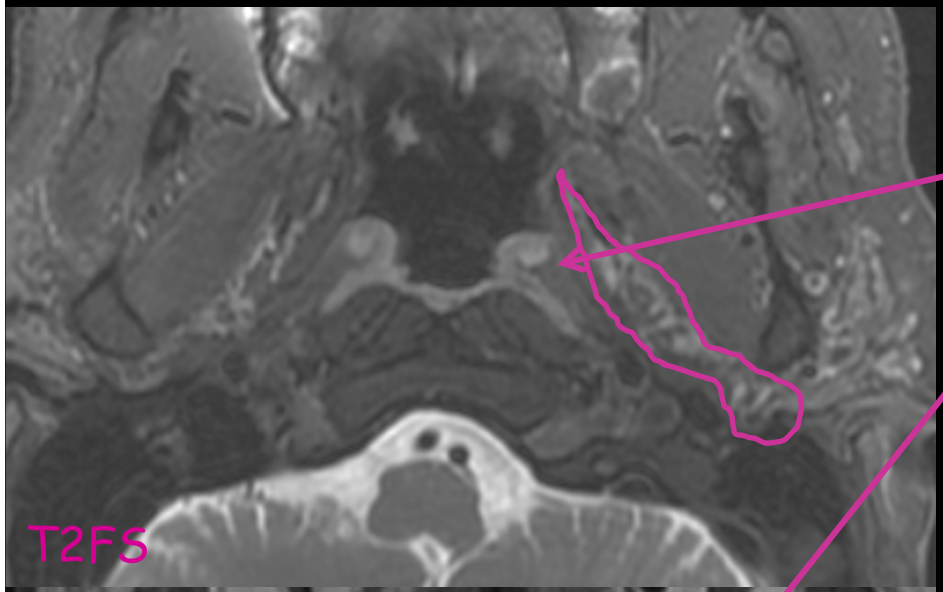


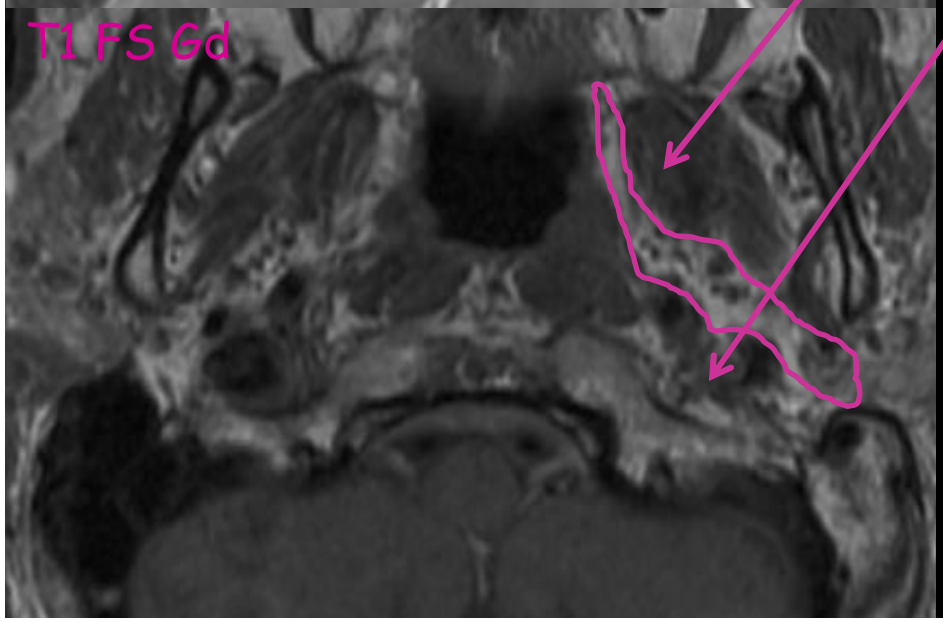
- N. mandibularise harud V3
- Rasv
- Neelu venoosne pleksus
- Lisasüljenäärme jääkkude



ERASMUS Head and Neck 2011

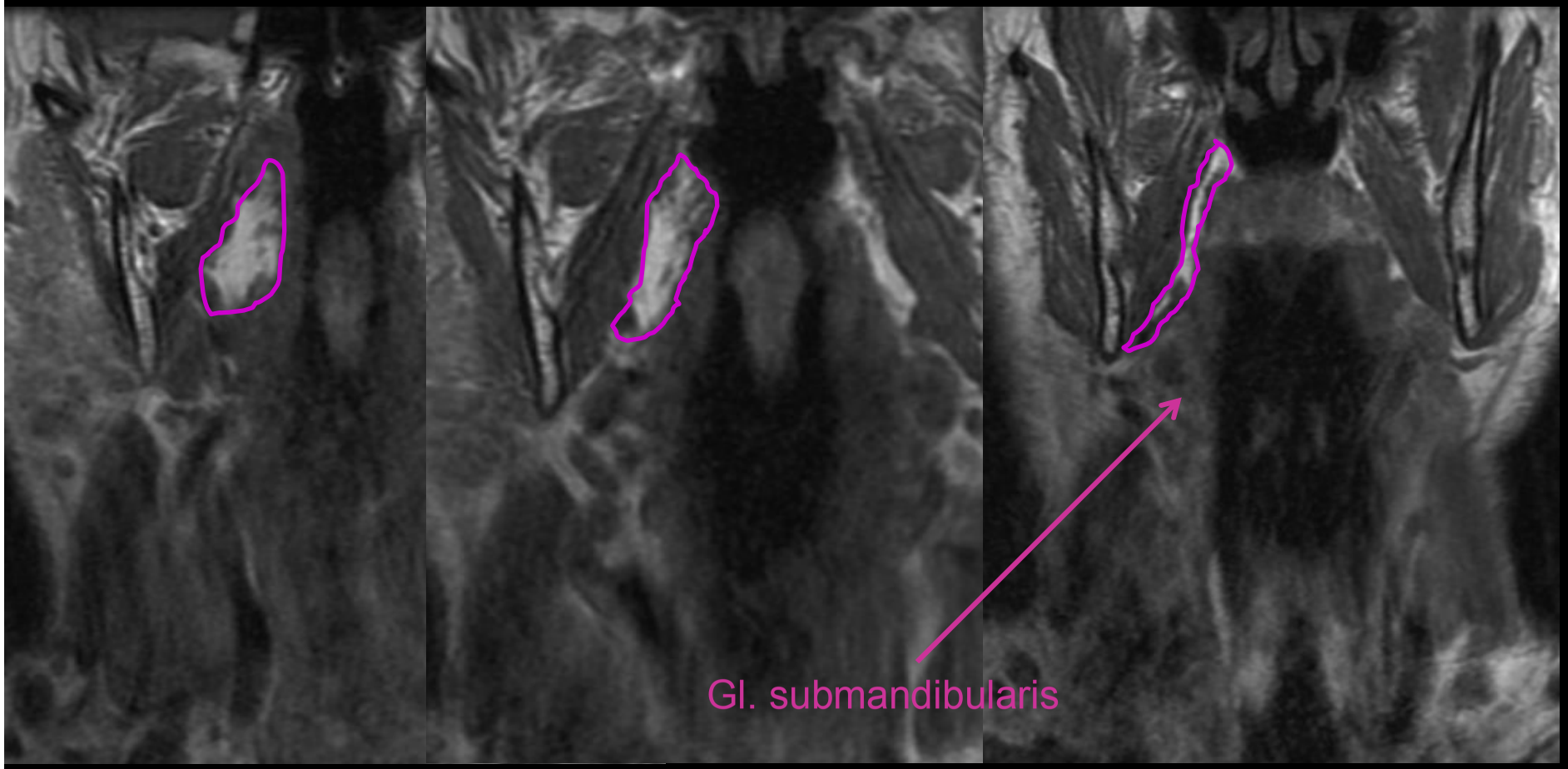
Parafarüngeaalruum PPS





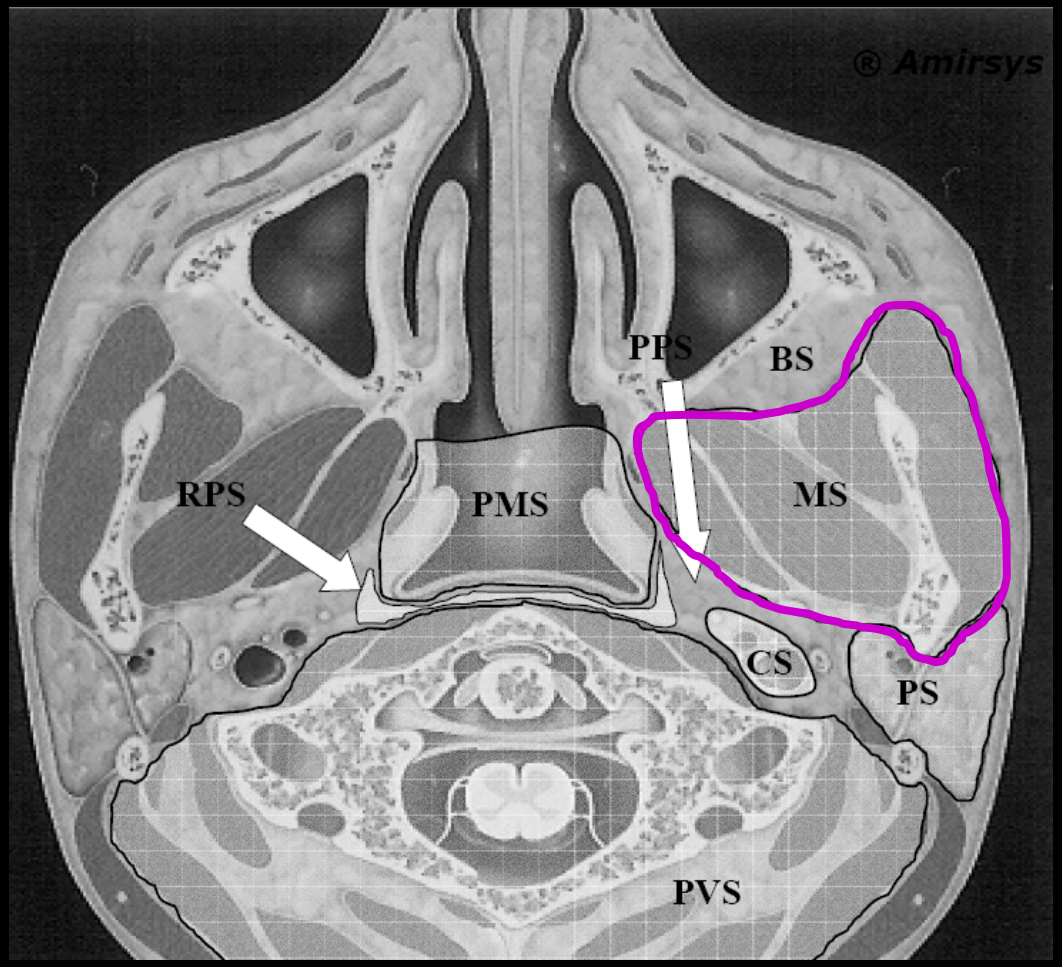
- M. tensor veli palatini
- M. Pterygoideus medialis
- Karootisruum

Parafarüngeaalruum PPS

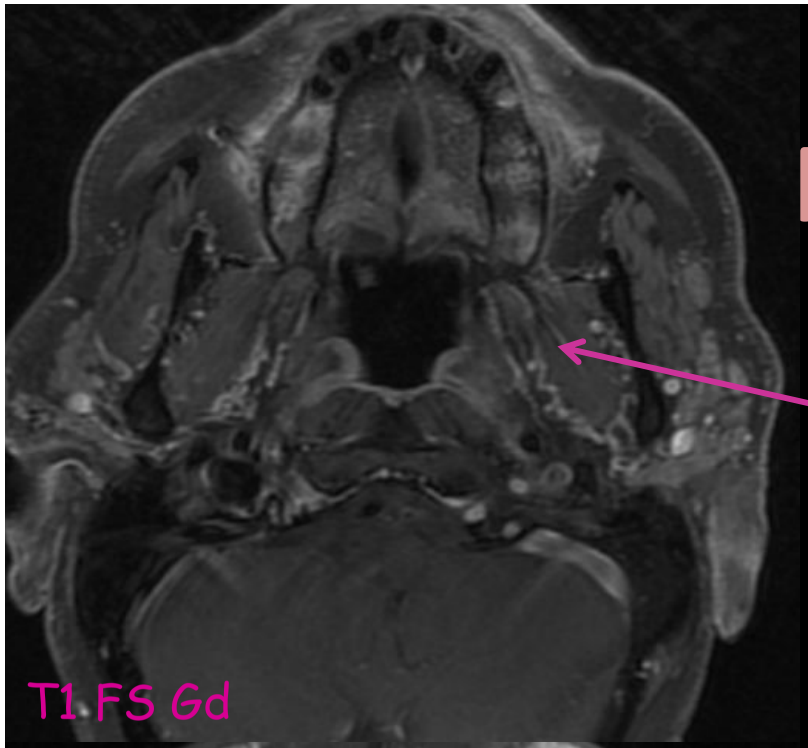


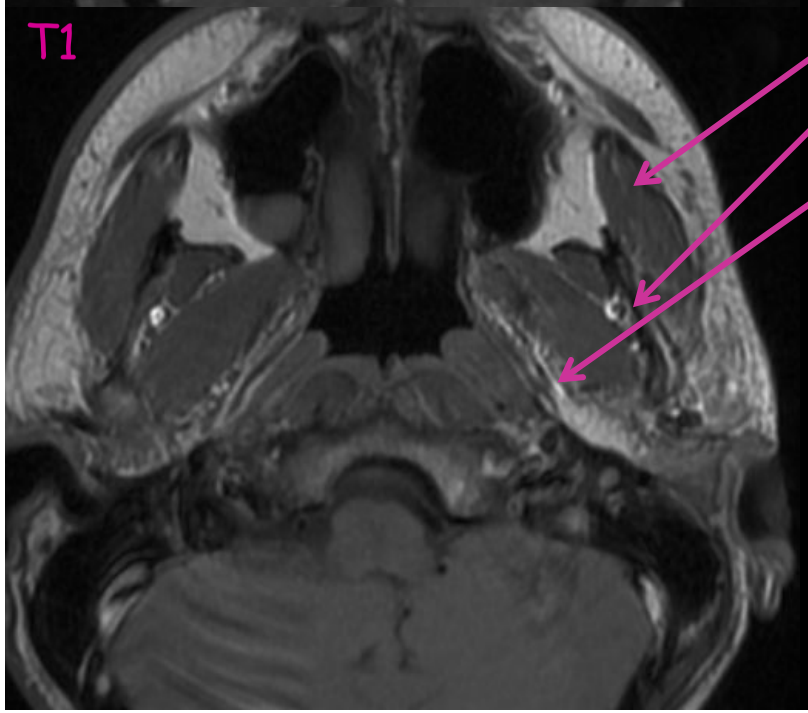
T1

Mastikaatorruum
MS Masticator Sp



- Lihased
- Mandibula
- N. Mandibularis V3

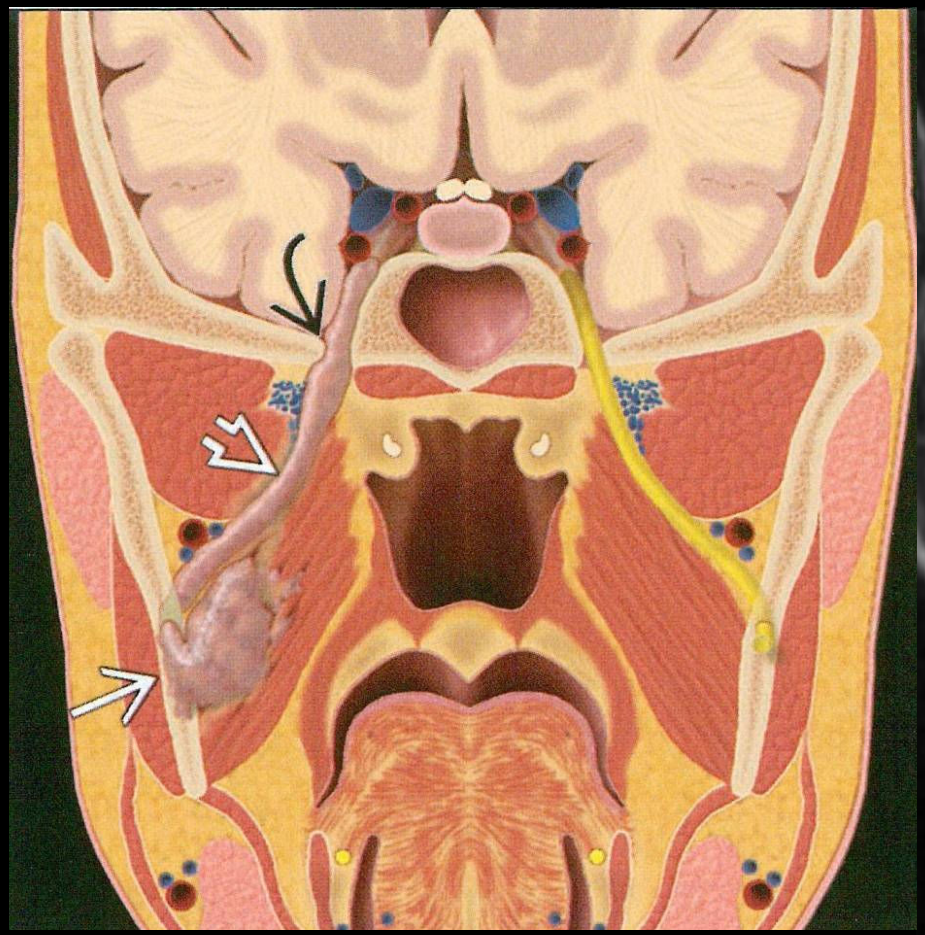


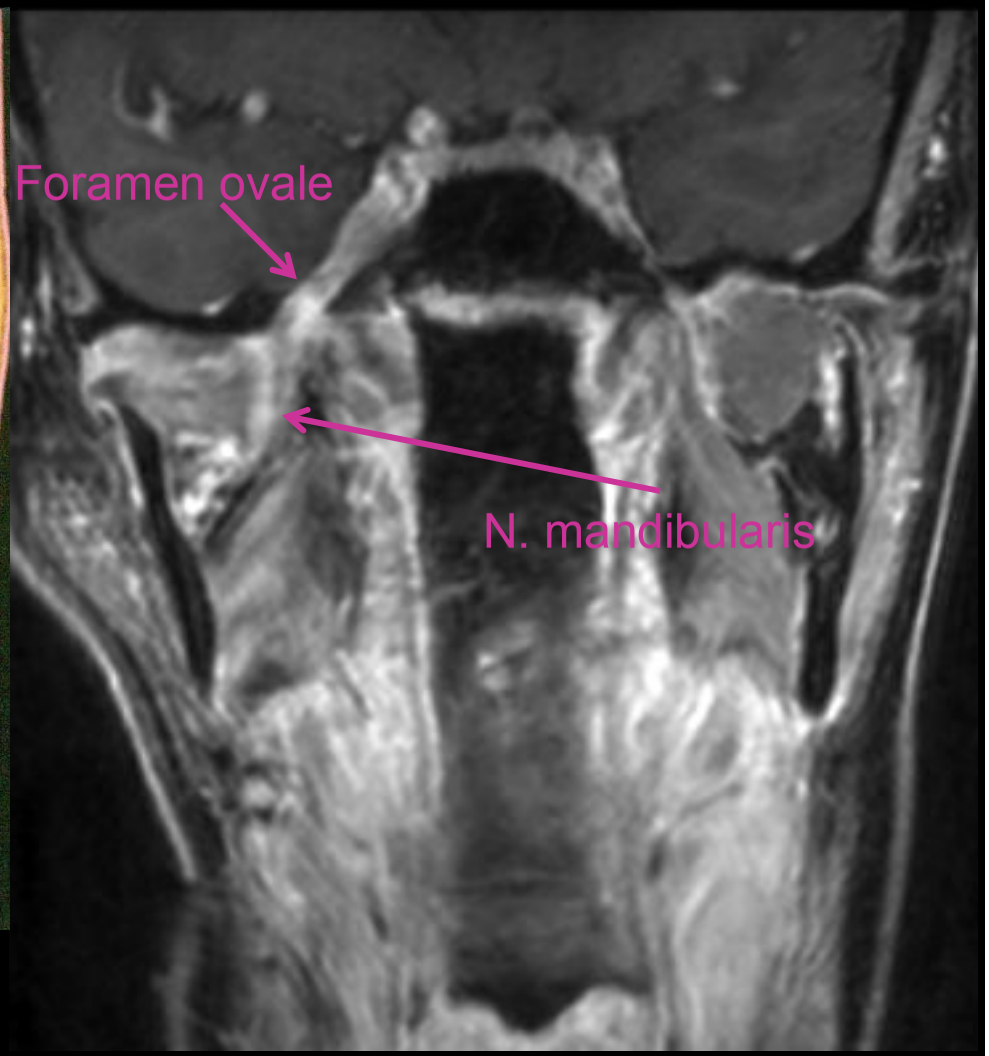


Mastikaatorruum **MS**

- Lihased
  - M. Pterygoideus medialis et lateralis
  - M. masseter
- Mandibula
- N. Mandibularis V3

Mastikaatorruum **MS**

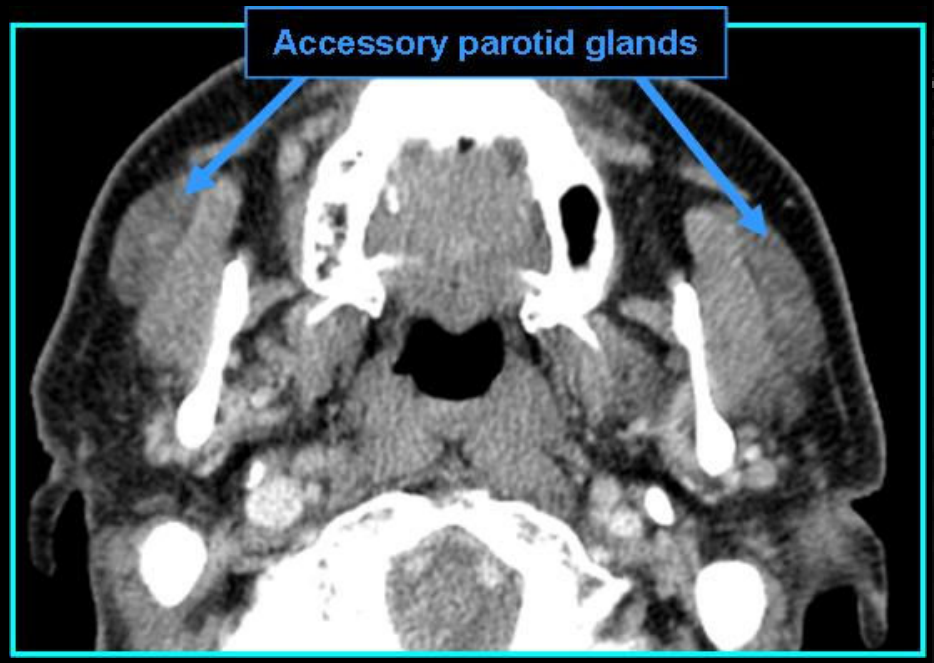


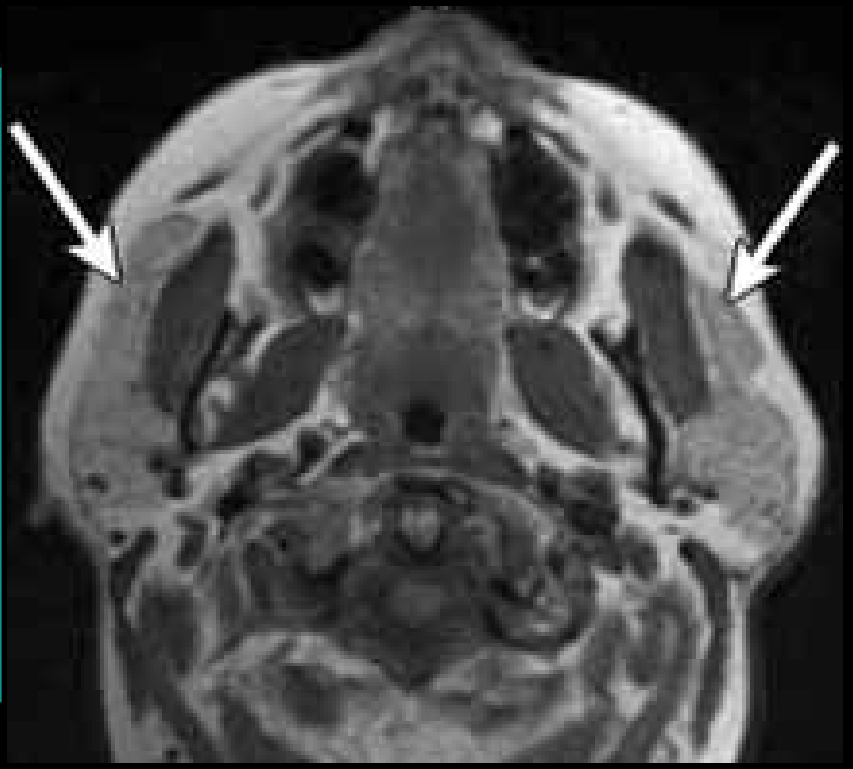


ERASMUS Head and Neck 2011

T1 FS Gd

Lisa parootis

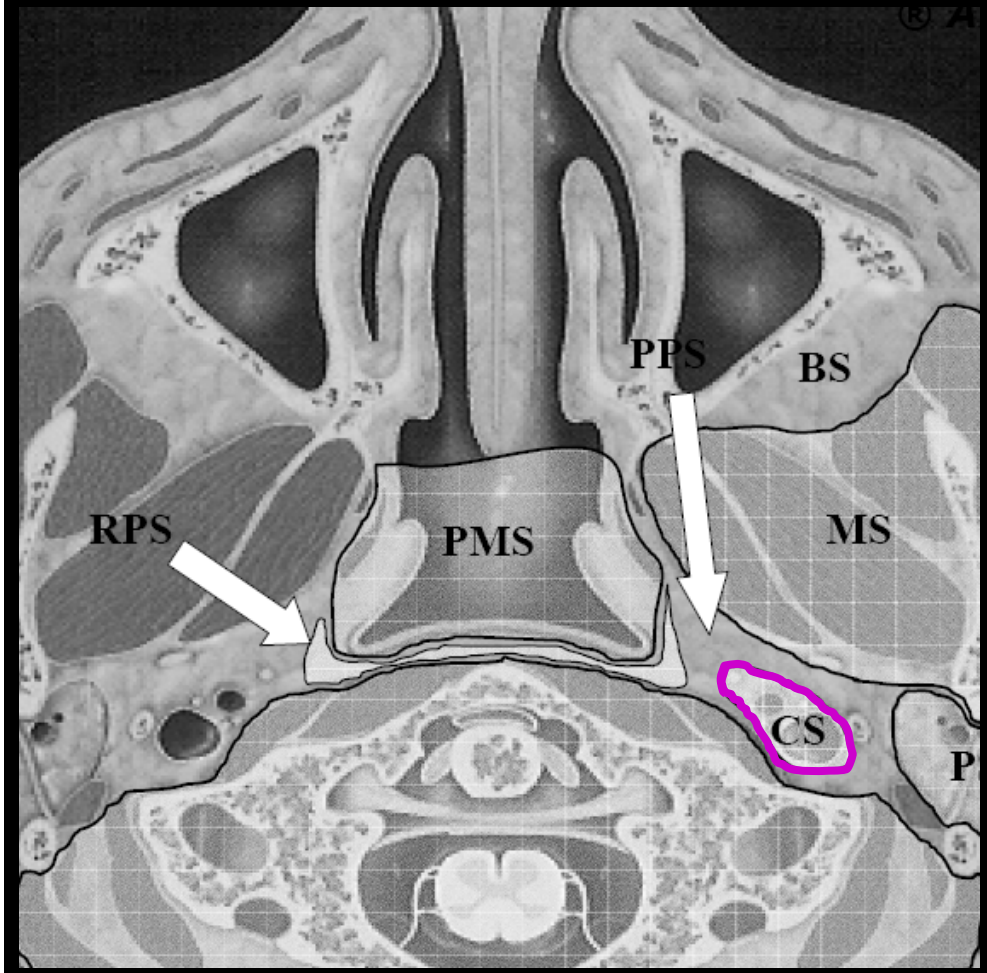




wiki.uiowa.edu

urmc.rochester.edu

Karootisruum
CS Carotis Sp

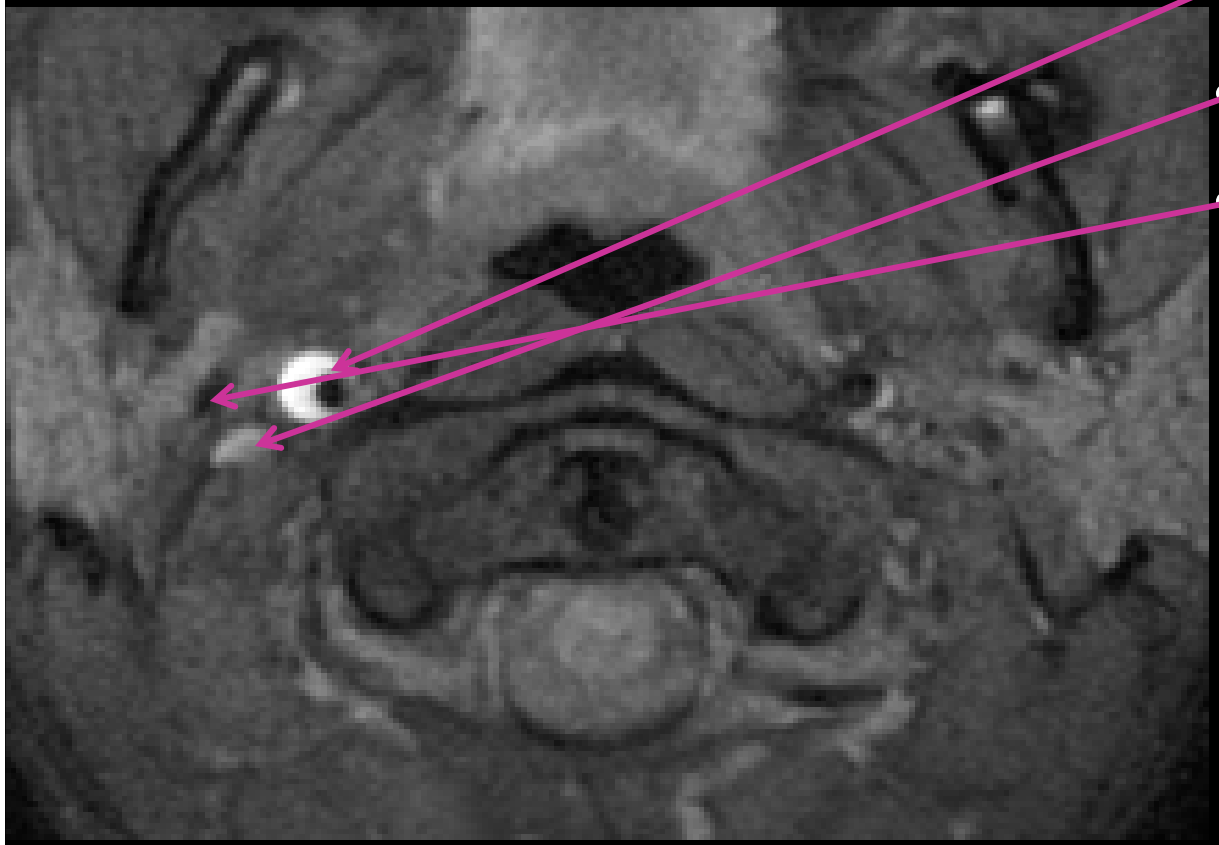


- IX, X, XI,XII
- Sümpaatiline pleksus
- Unearter
- Jugulaarveen
- LS-d

ERASMUS Head and Neck 2011

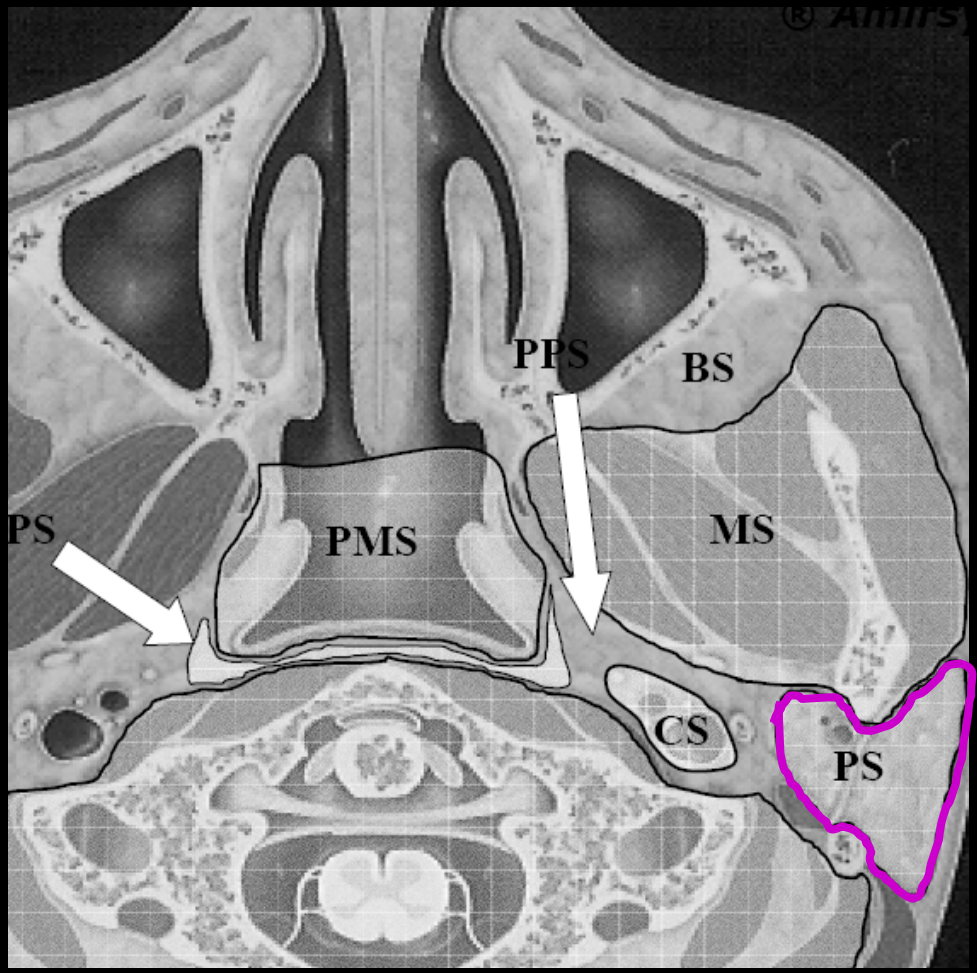
IX
Acc
X
XII

Karootisruum **CS**



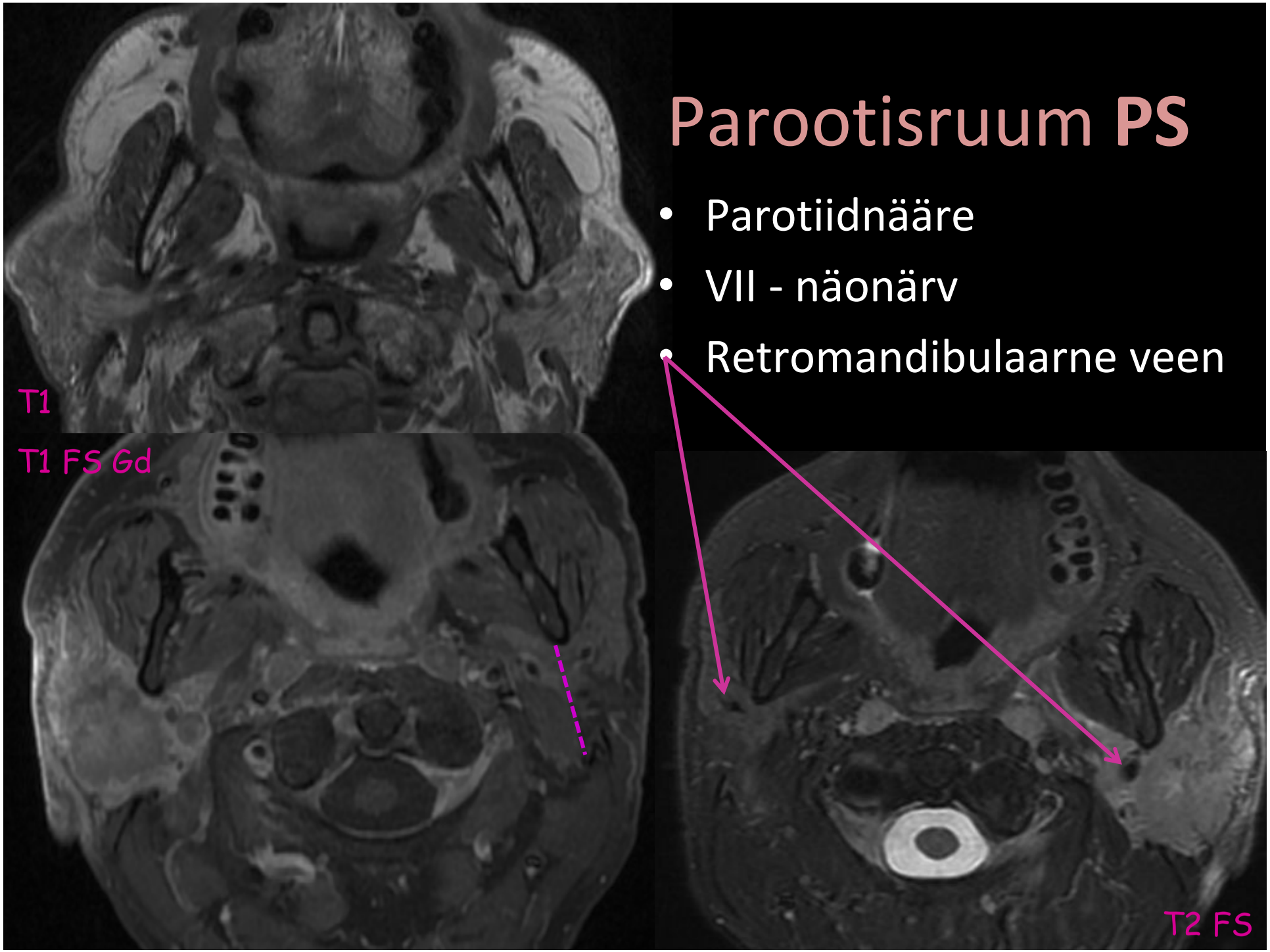
- Unearter
- Jugulaarveen
- Stüloidjätke

Parootisruum
PS Parotis Sp

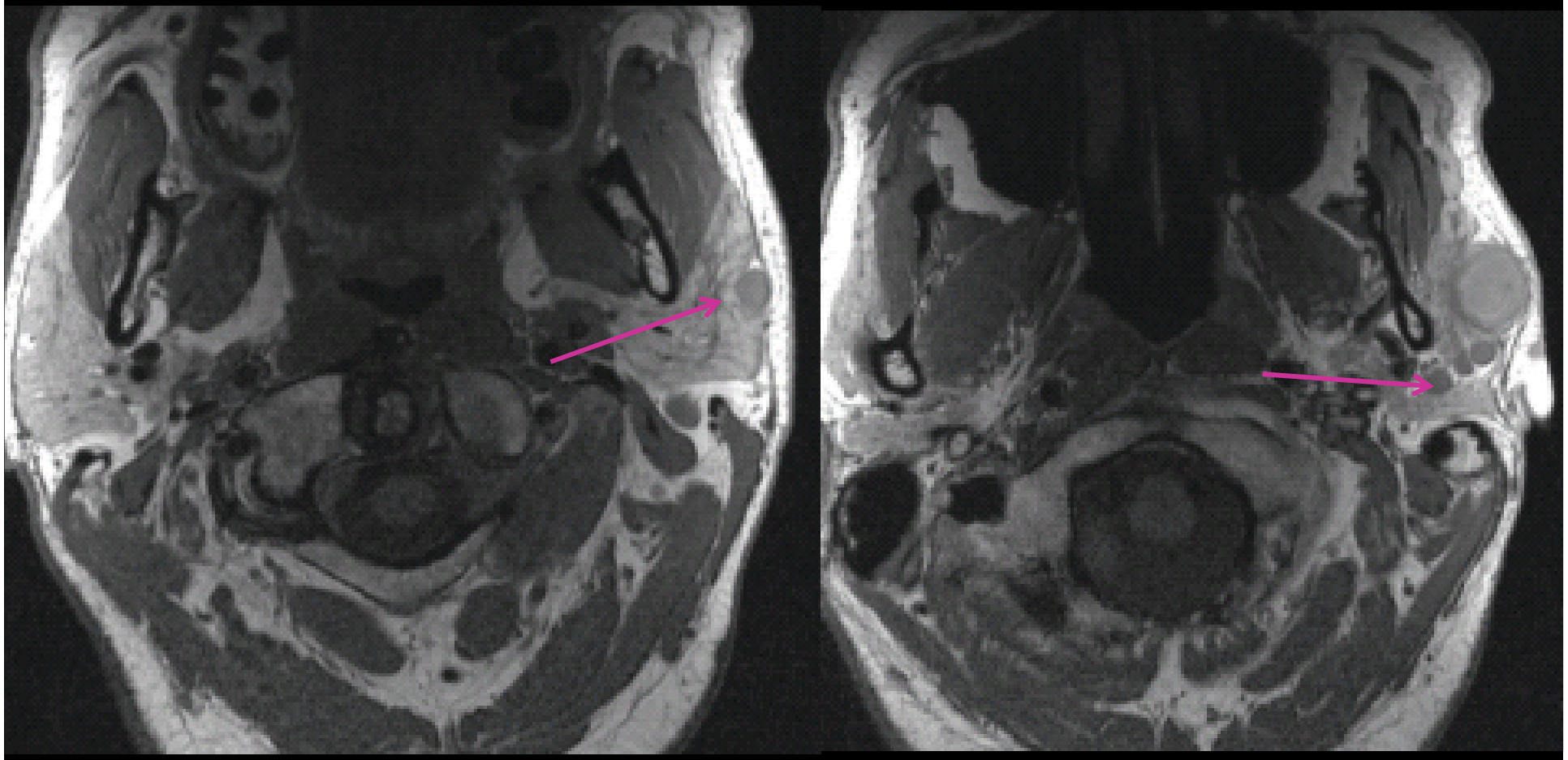


- VII - näonärv
- Parotiidnääre
- Näärmesisesed ls-d
- A. Carotis ext
- V. Jugularis ext et retromandibularis

ERASMUS Head and Neck 2011


Parootisruum **PS**
• Parotiidnääre
• VII - näonärv
• Retromandibulaarne veen
T1
T1 FS Gd
T2 FS

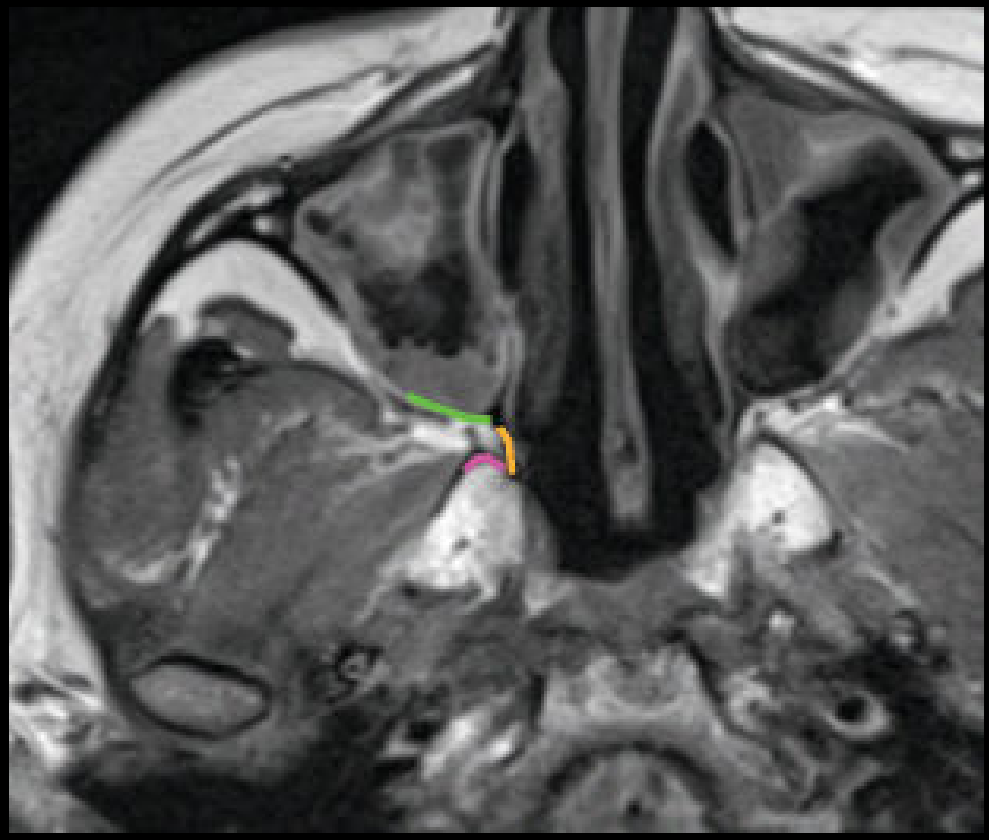
LS-d näärmes



T1

Fossa pterygopalatina

- Piirid:
  - Eesmine maksillaarurke sein
  - Mediaalne suulaeluu vertikaalse jätke
  - Tagumine pterygoidjätke lateraalne plaat

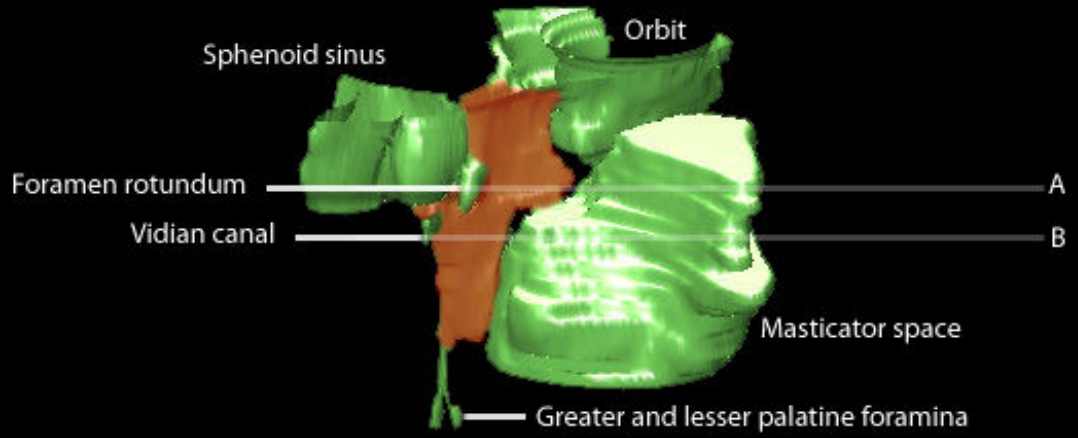


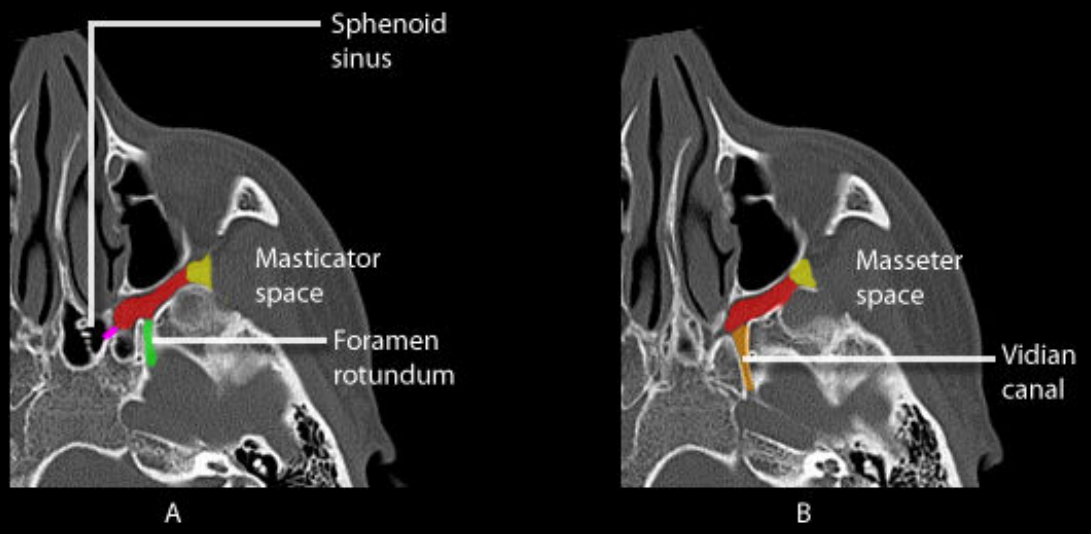
Sisaldab:
N. Maxillaris V2
Ganglion pterygopalatina
A. maxillaris

Väga oluline ühendustee ninaõõne, ninaneelu ja kaela süvaruumide vahel

Fossa pterygopalatina

- Mastikaatorruumiga
- Ninaõõnega
  - foramen sphenopalatinum
- Orbitaga
  - fissura orb.sup.
- Koljuga
  - foramen rotundum, Vidian canal
- Suuõõnega





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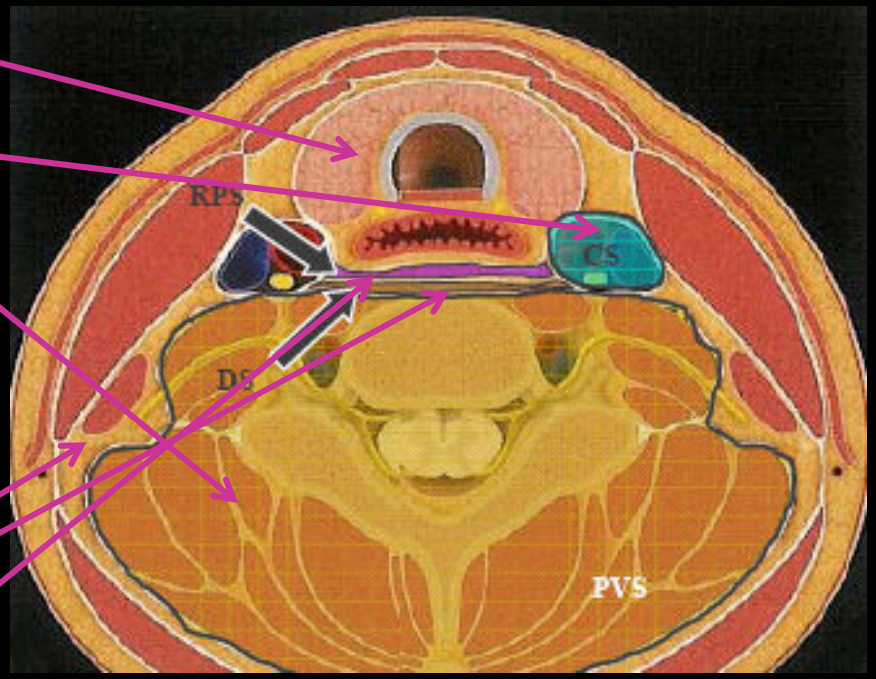
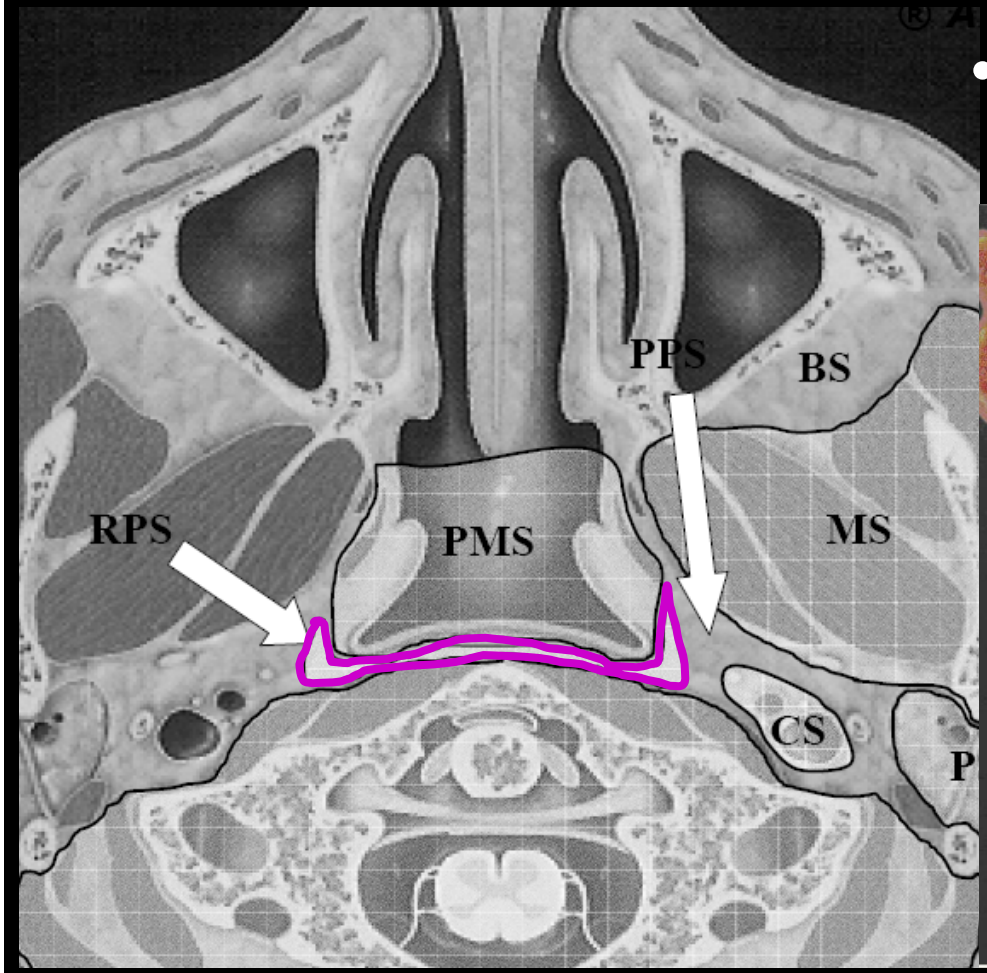
IHN – keeleluust all

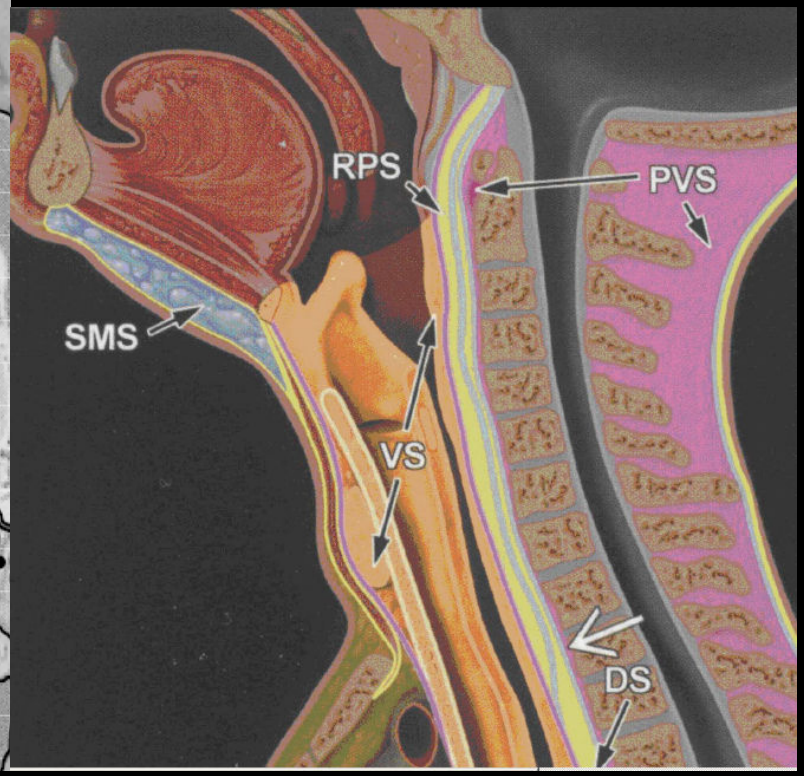
- Organite ruum VS
- Karootisruum CS
- Perivertebraalruum PVS
  - Prevertebraalruum
  - Paraspinaalruum
- Tagumine kaela ruum PCS
- Retrofarüngeaalruum RPS
- Ohtlik ruum DS



Retrofarüngeaalruum
RPS Retropharyngeal Sp

- LS-d keeleluust üleval pool
- Ulatub Th3





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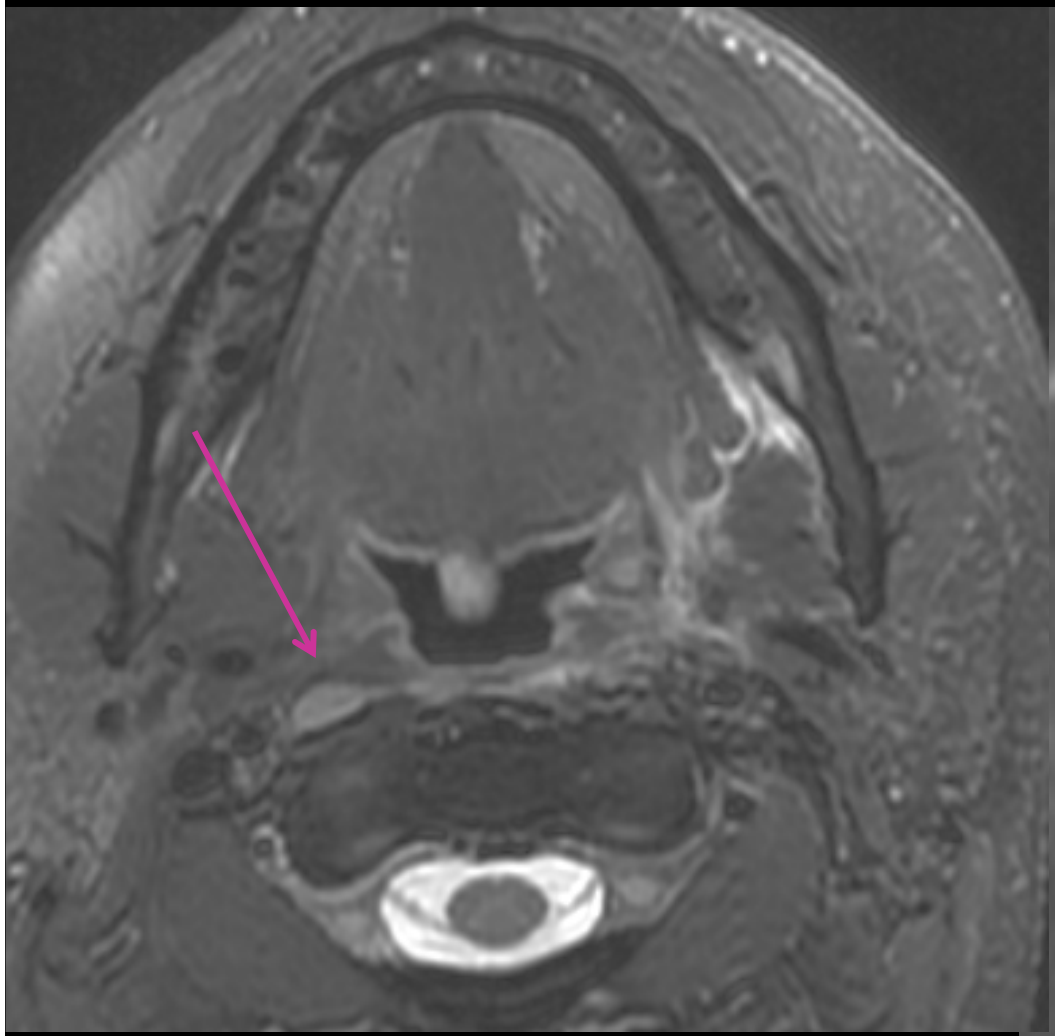
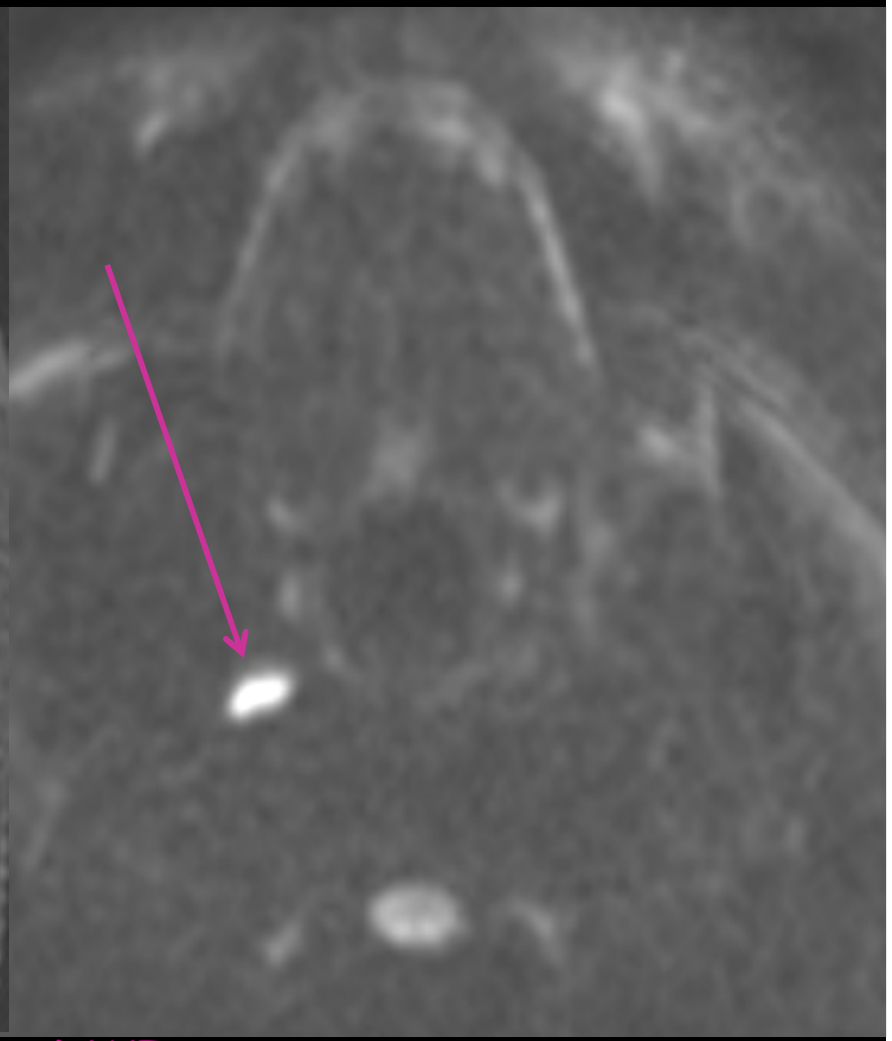
Retrofarüngeaalruum **RPS**

Retrofarüngeaalruum **RPS**

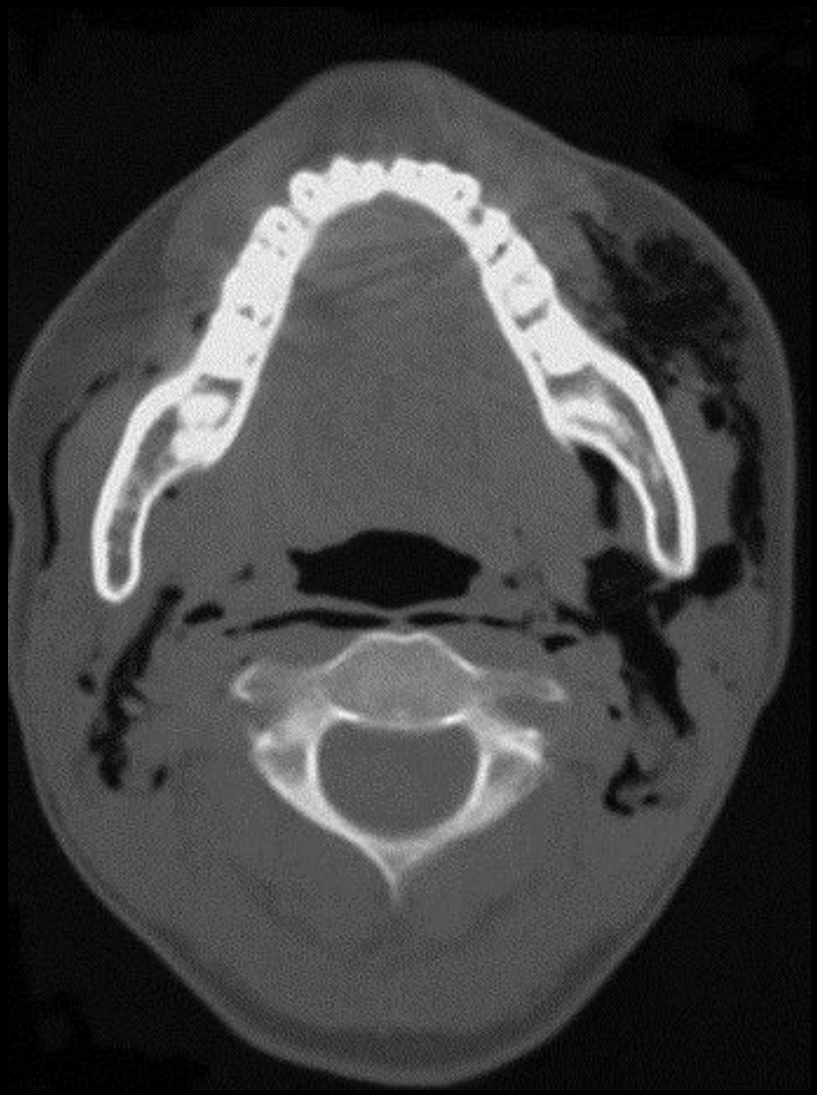


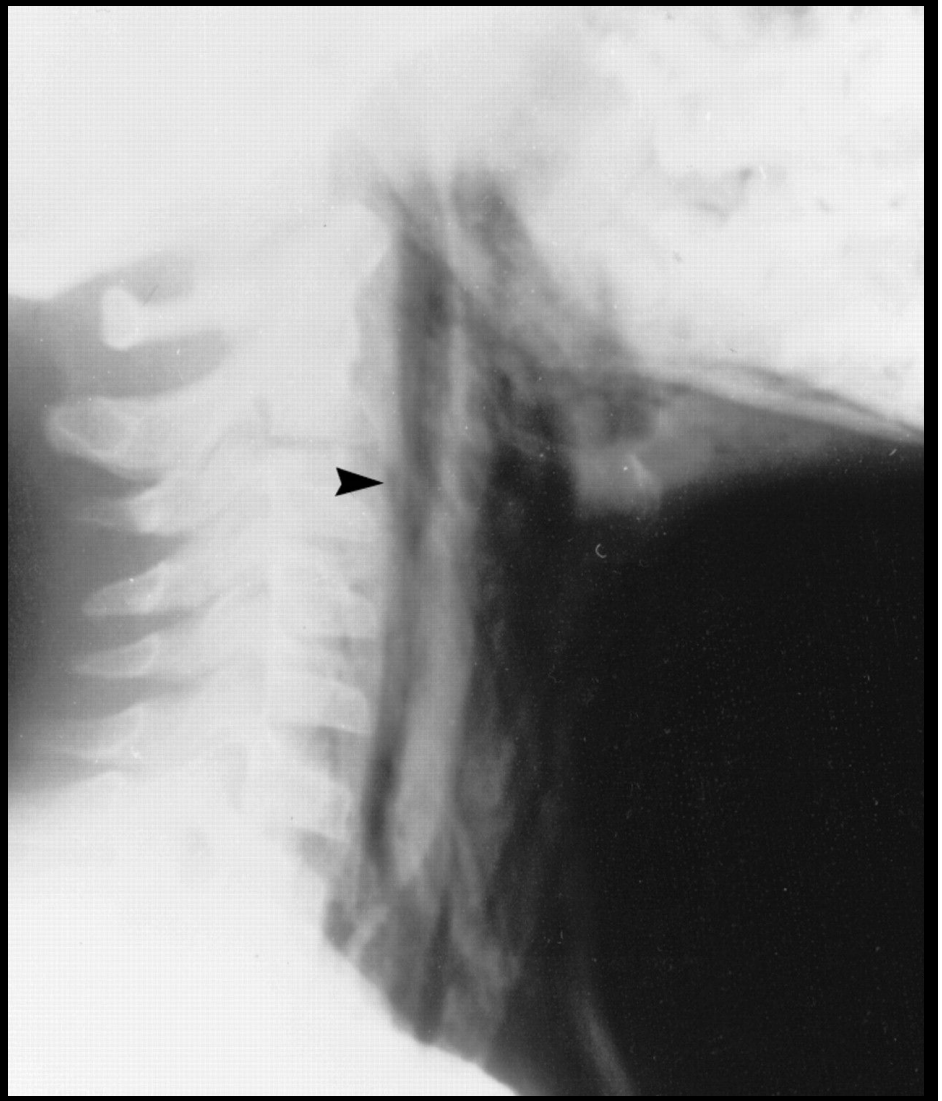
T1 FS Gd



DWI

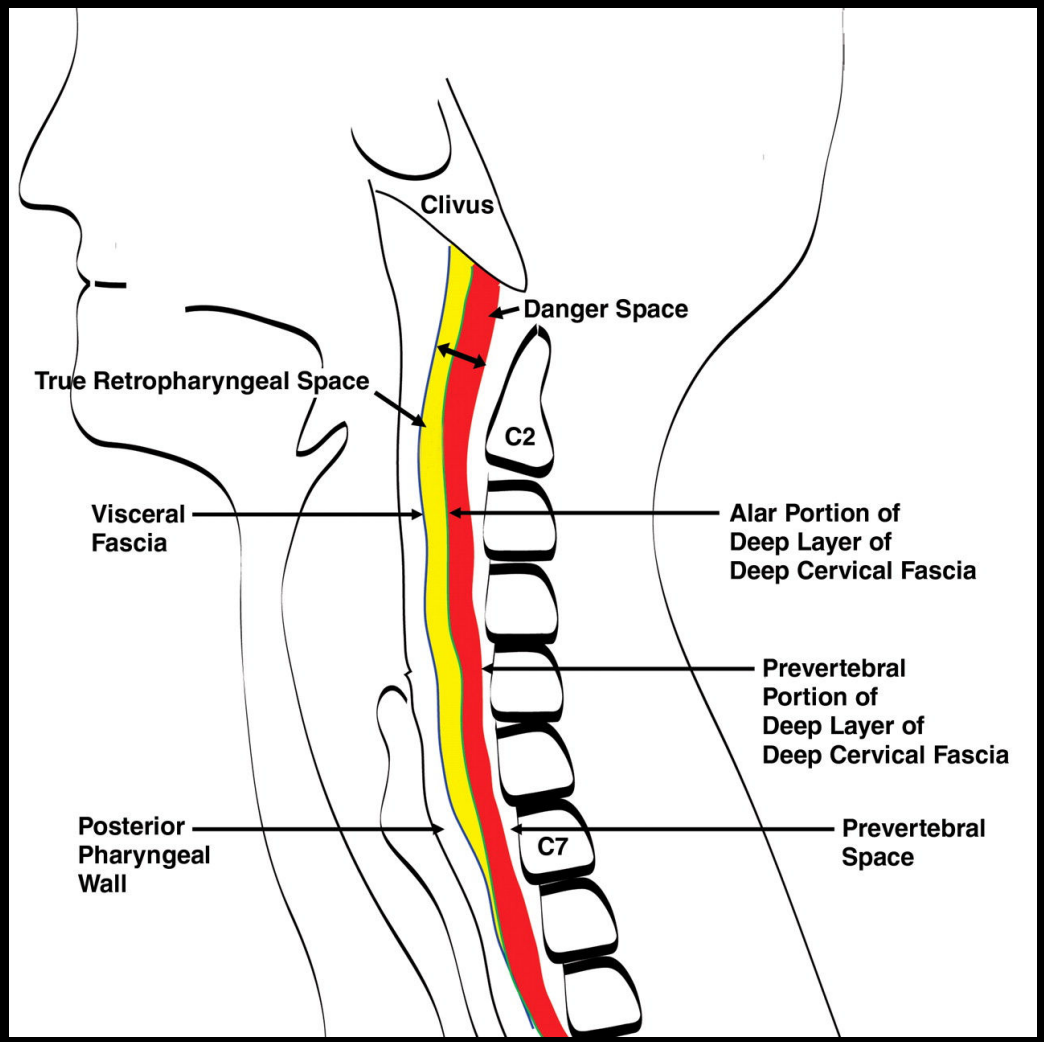
Retrofarüngeaalruum **RPS**





American Journal of Otolaryngology, Volume 25, Issue 4, July–August 2004 , Pages 290-294
Joseph L Smith, Jack M Hsu

Retrofarüngeaalruum RPS



- Fastsia jaotab kaheks
- Ohtlik ruum
  - Danger space

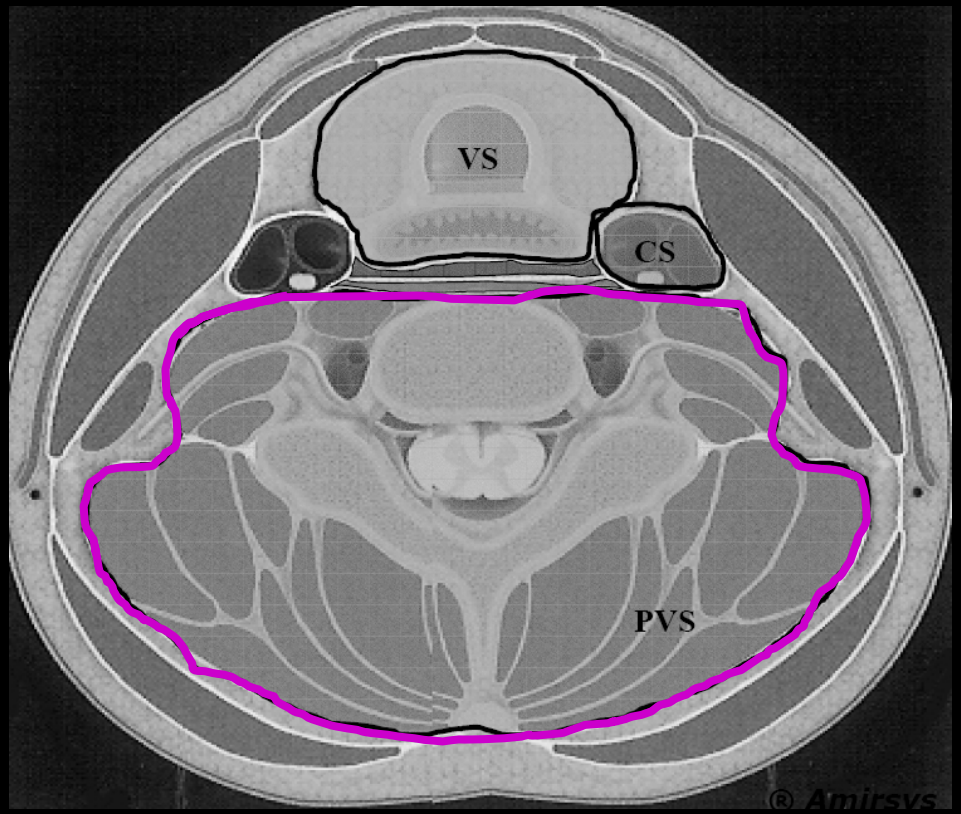
Hoang J K et al. AJR 2011;196:W426-W432

Retrofarüngeaalruum RPS

Prevertebraalse ruumi põletik

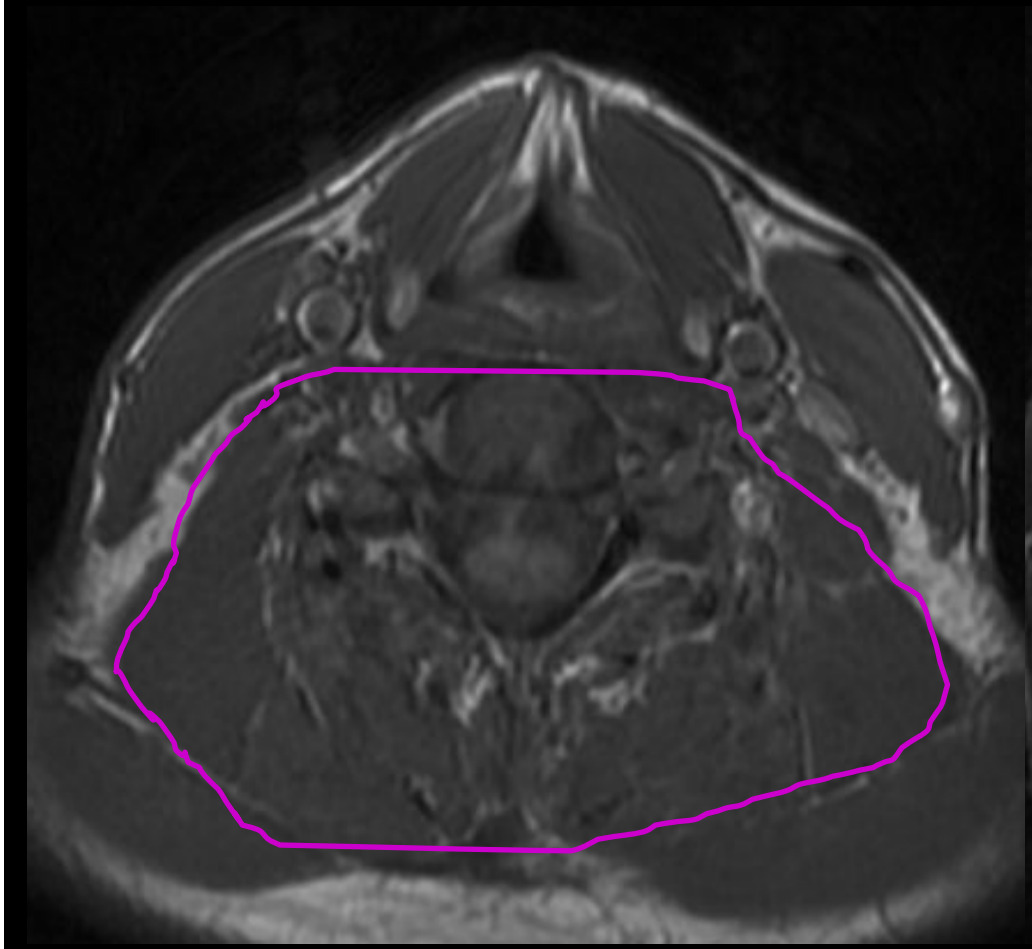
Hoang J K et al. AJR 2011;196:W426-W432

Perivertebraalne ruum
PVS Perivertebral Sp

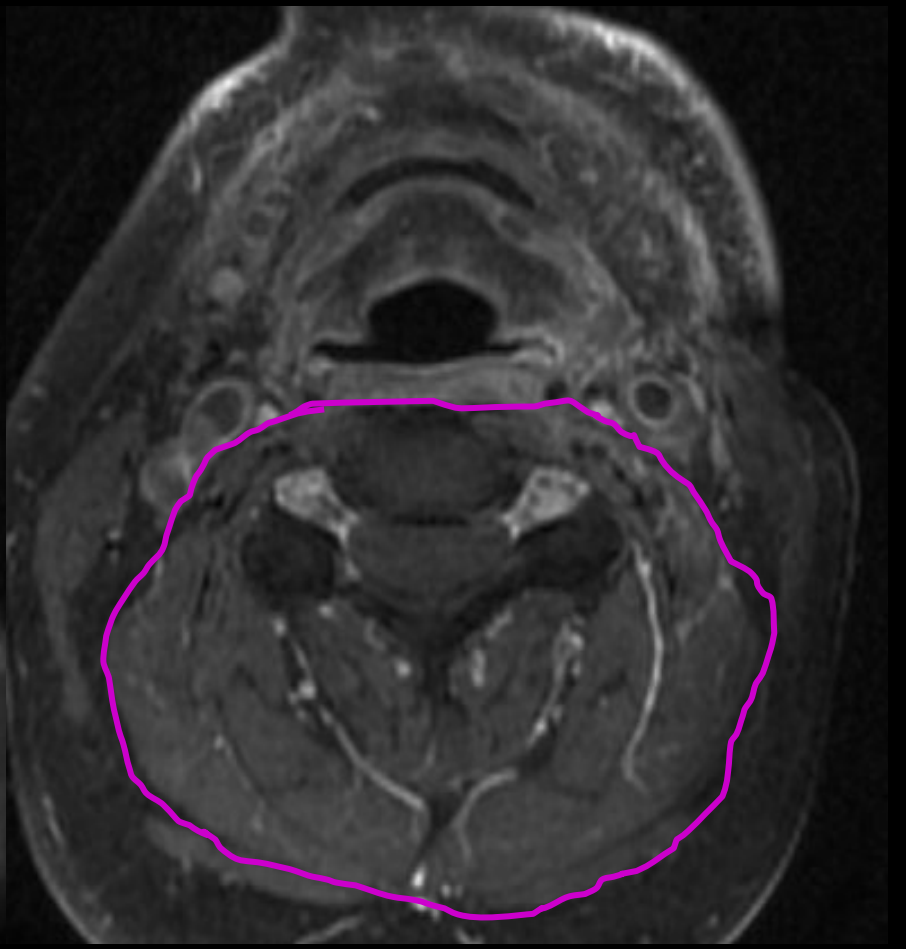


- Õlapõimiku osad
- N. Phernicuse harud
- A. V. Vertebralis
- Pre-, paravertebraalsed lihased
- M. scalenus

Perivertebraalne ruum PVS

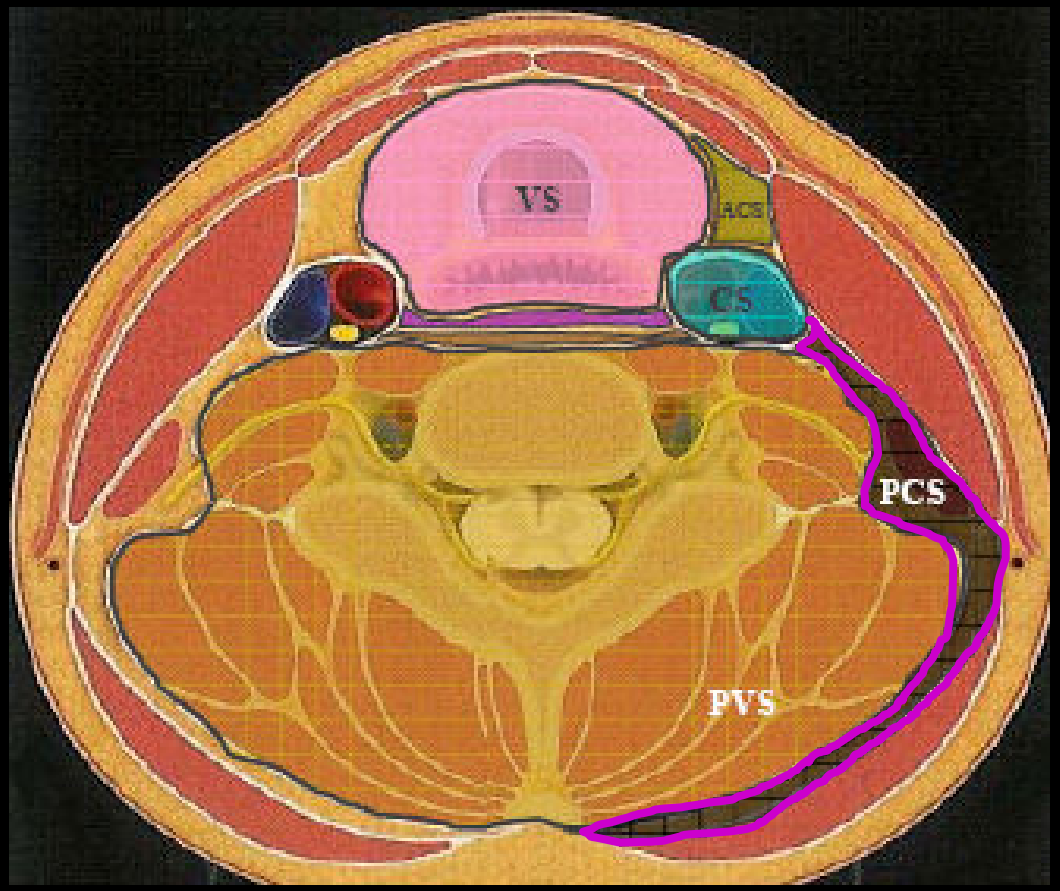


T1



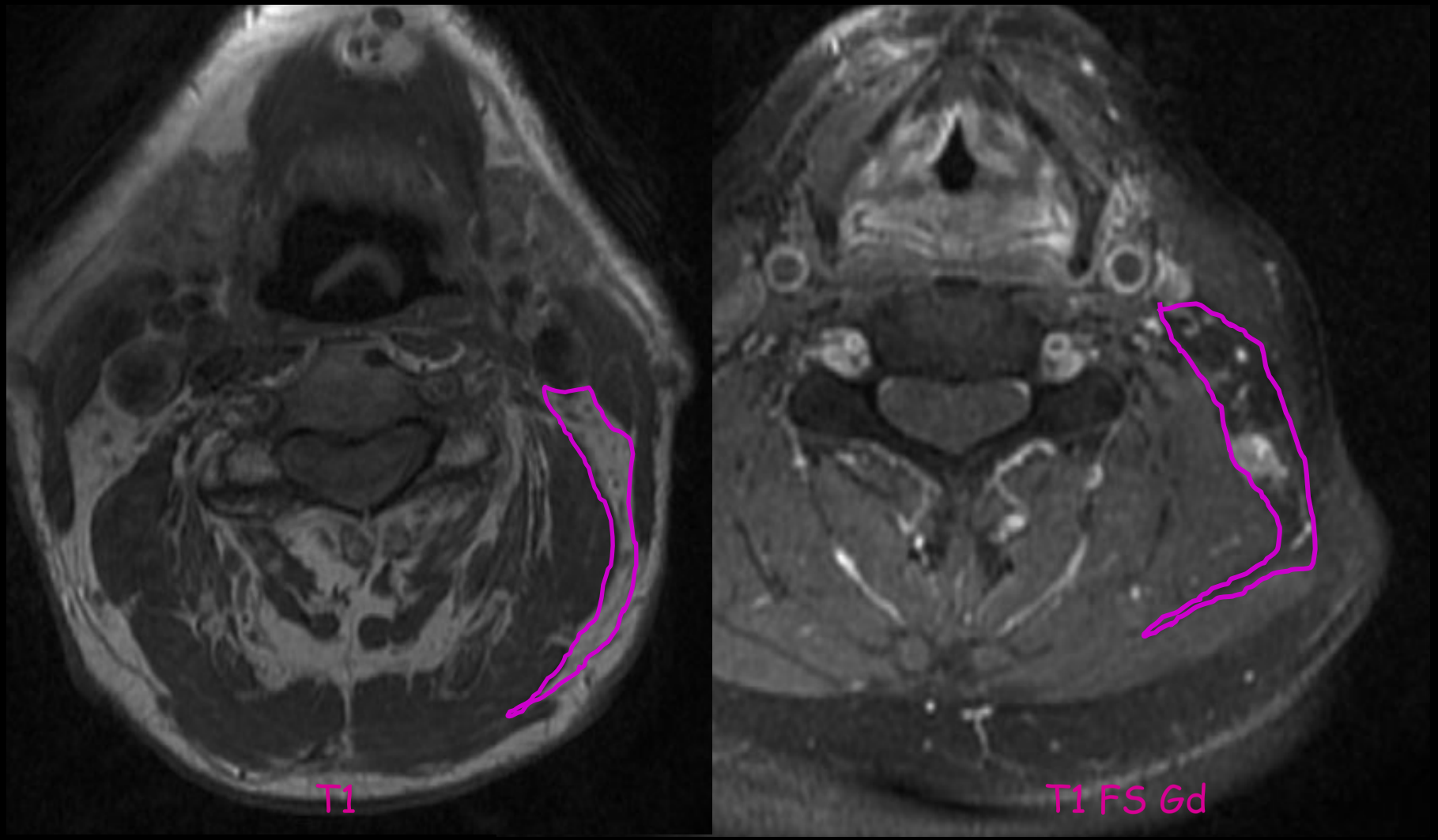
T1 FS Gd

Tagumine kaelaruum
PCS Posterior Cervical Sp

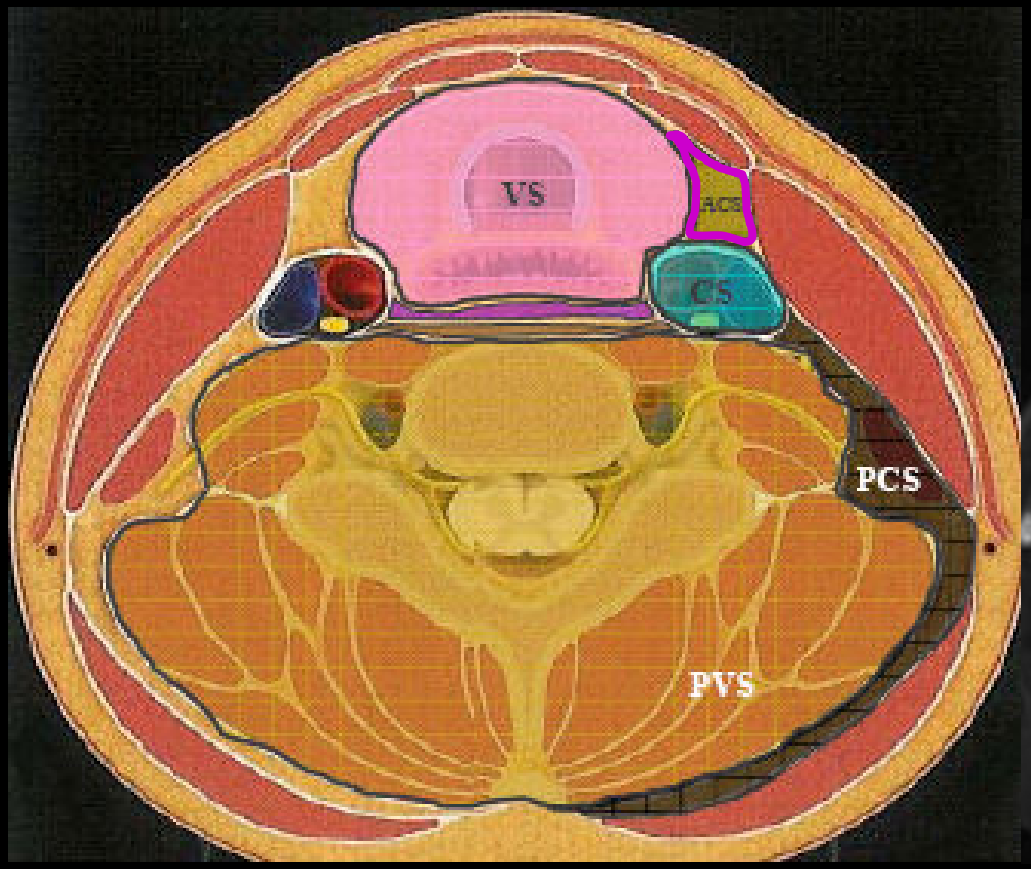


- Rasv, XI närv, LS
- Fastsiatevaheline ruum

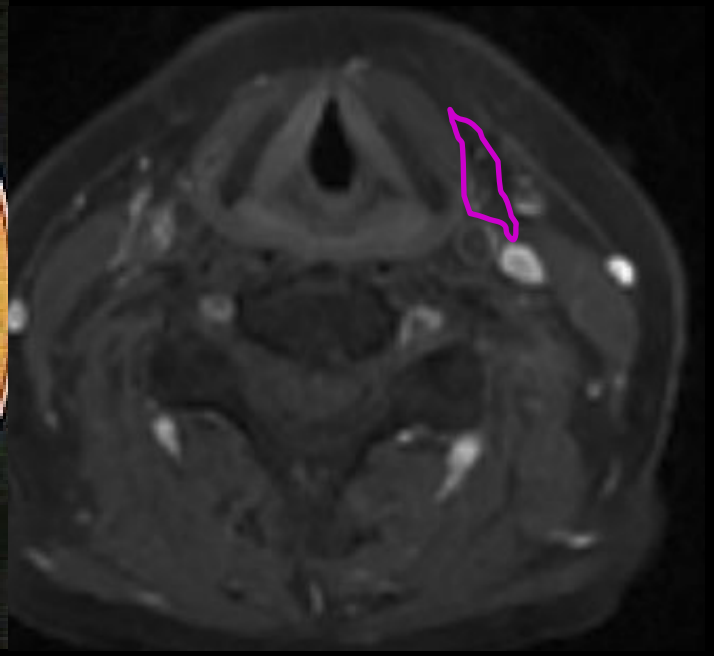
Tagumine kaelaruum PCS



Eesmine kaelaruum
ACS Anterior Cervical Sp



- Rasv
- Keeleluust rangluuni



T1 FS Gd

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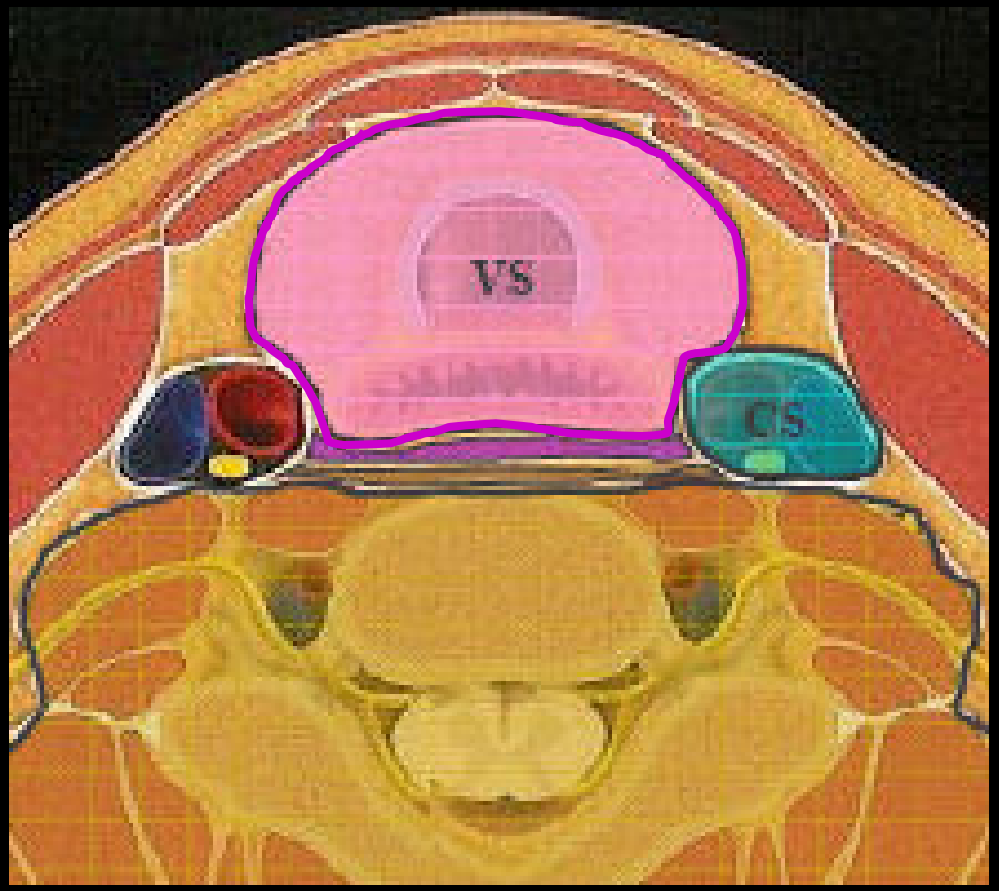
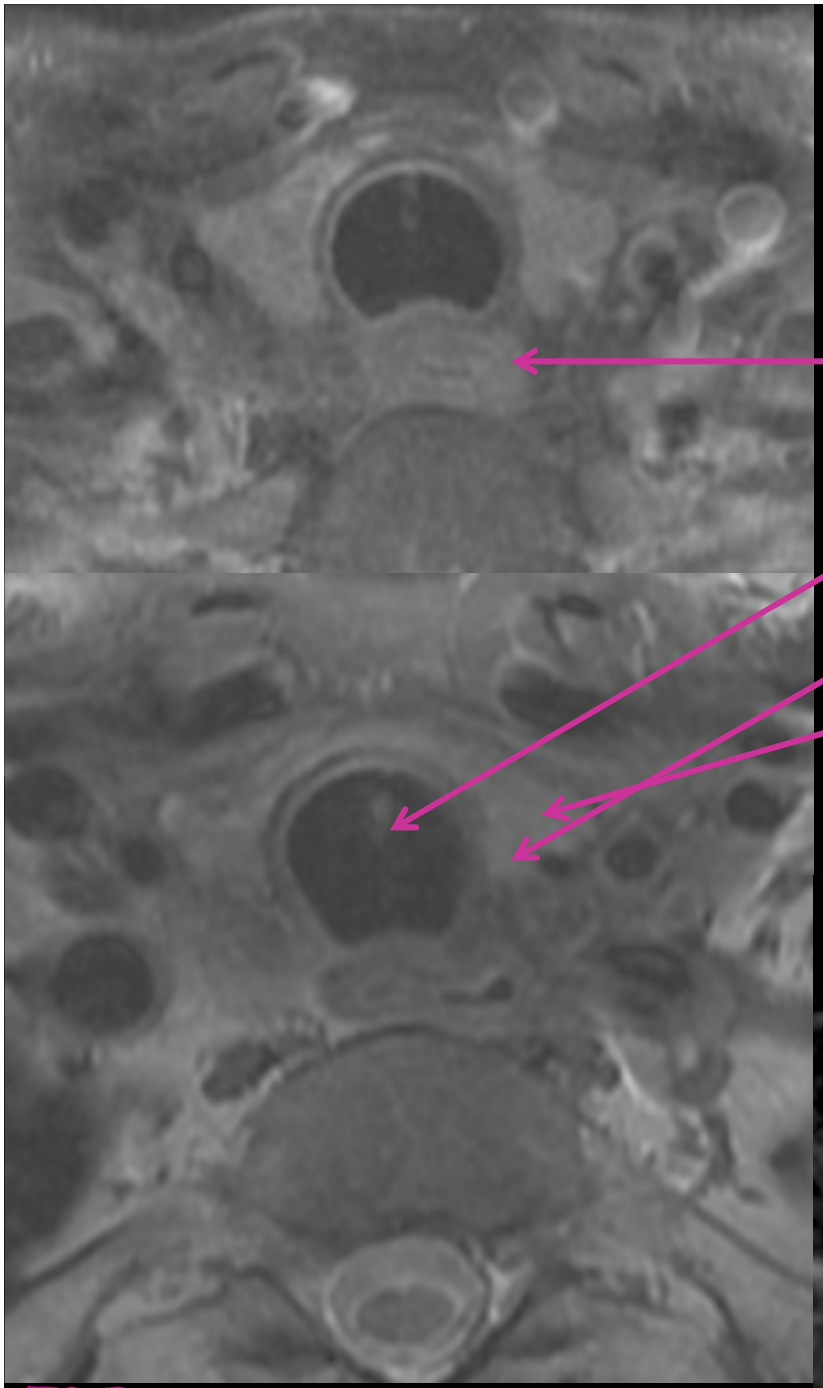
Organite ruum
VS Visceral Sp

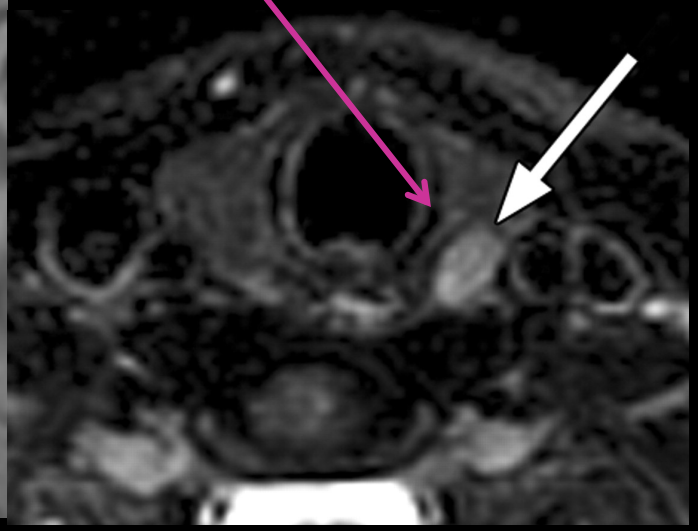


- Söögitoru
- Trahhea
- N. Recurrence
- Kilpnääre
- Kõrvalkilpnäärmed

Organite ruum VS

- Söögitoru
- Trahhea
- N. Recurrence
- Kilpnääre
- Kõrvalkilpnäärmed

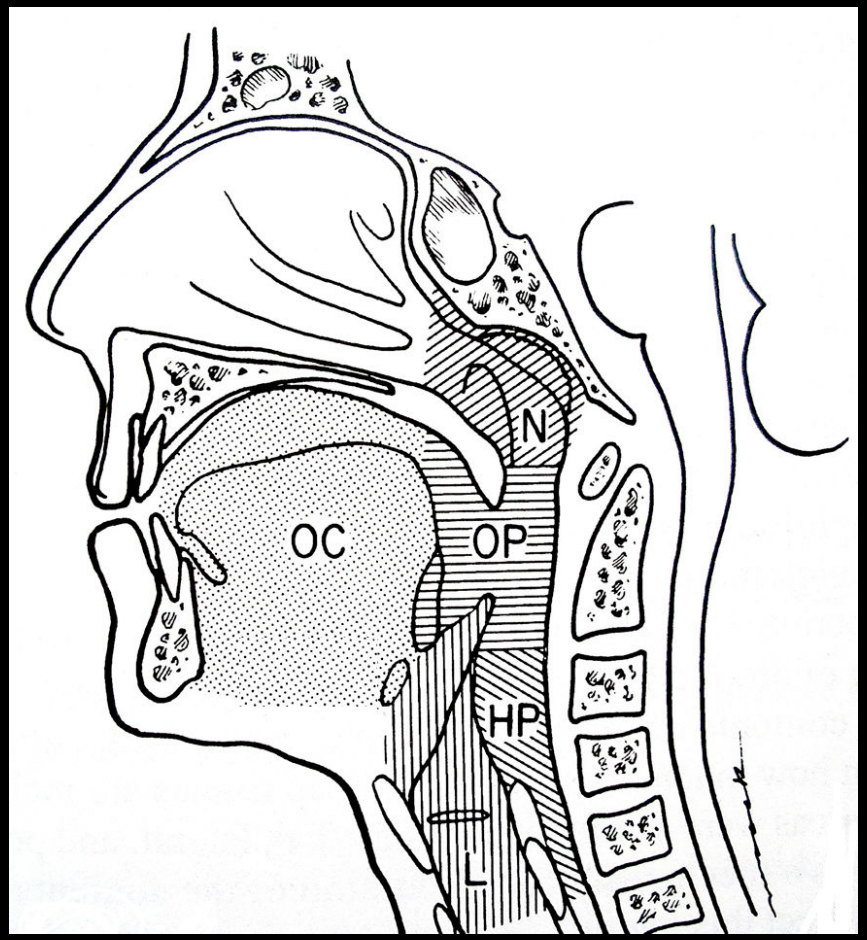




T2 FS

Johnson N A et al. AJR 2007;188:1706-1715

Alaneel ja kõri



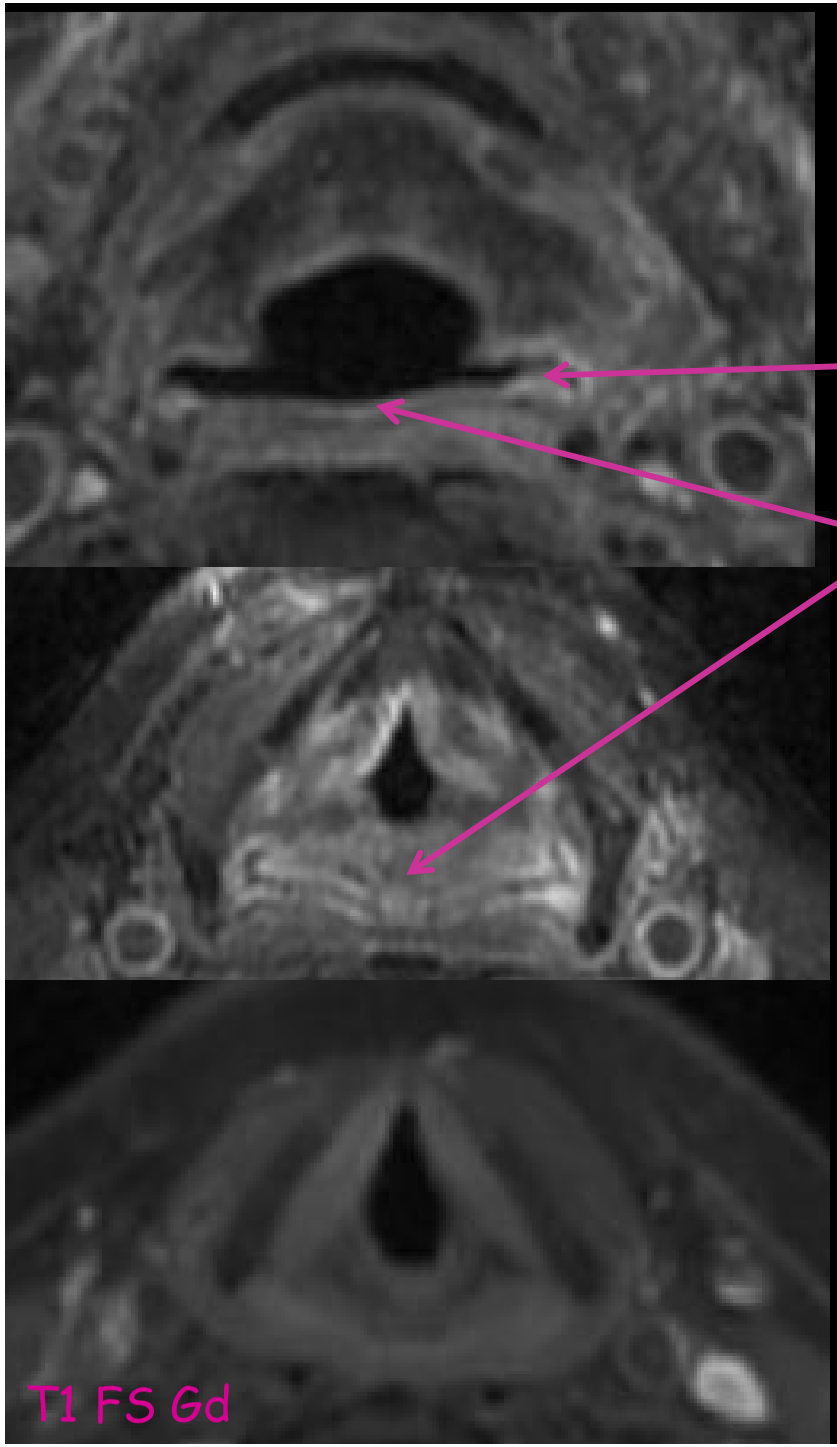
T1 FS Gd

Alaneel ja kõri

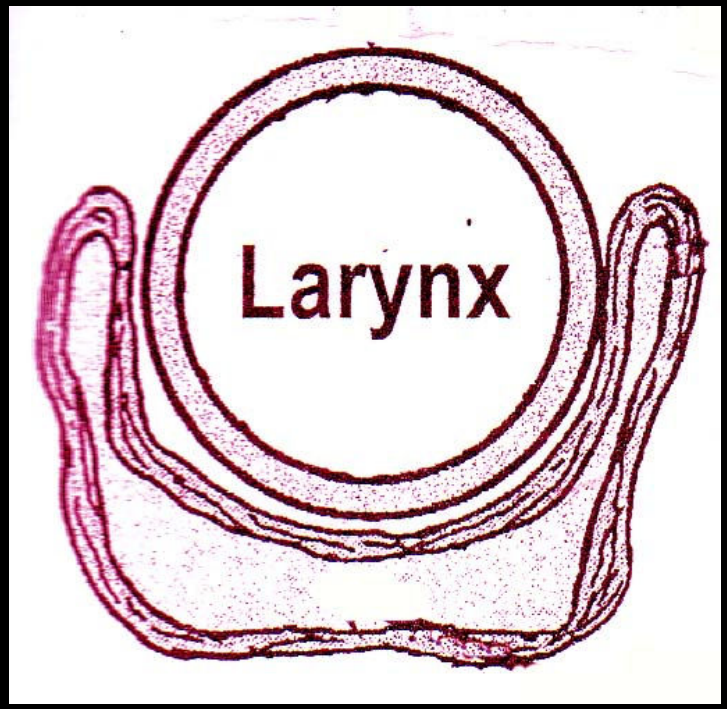
- Kõri moodustab alaneelu eesseina
- Alaneelu patoloogia varajases staadiumis haarab ka kõri

T1 FS Gd

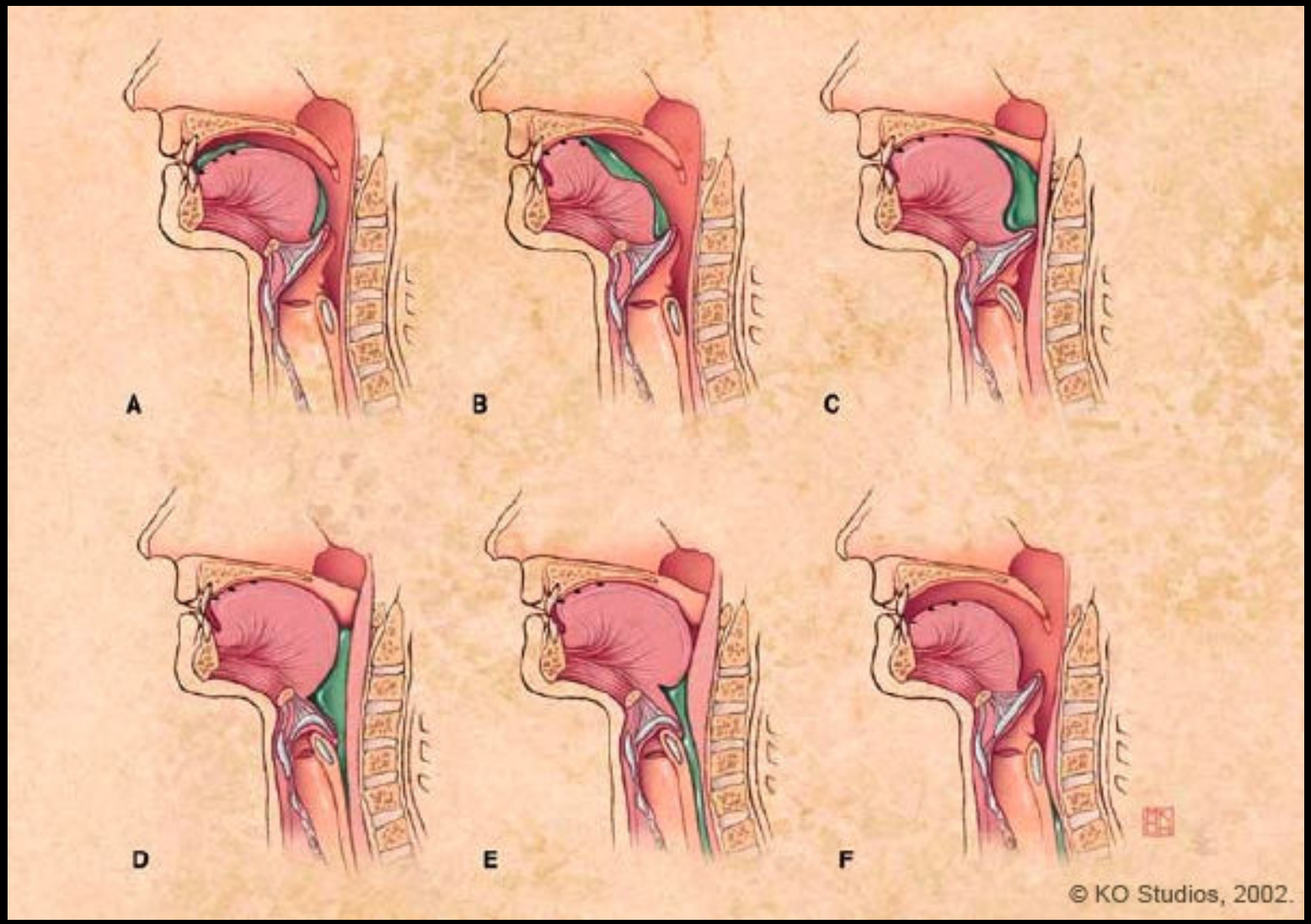
Alaneel



- Pirnsopis
- Postkrikoidne piirkond
- Neelu tagasein



Neelamine

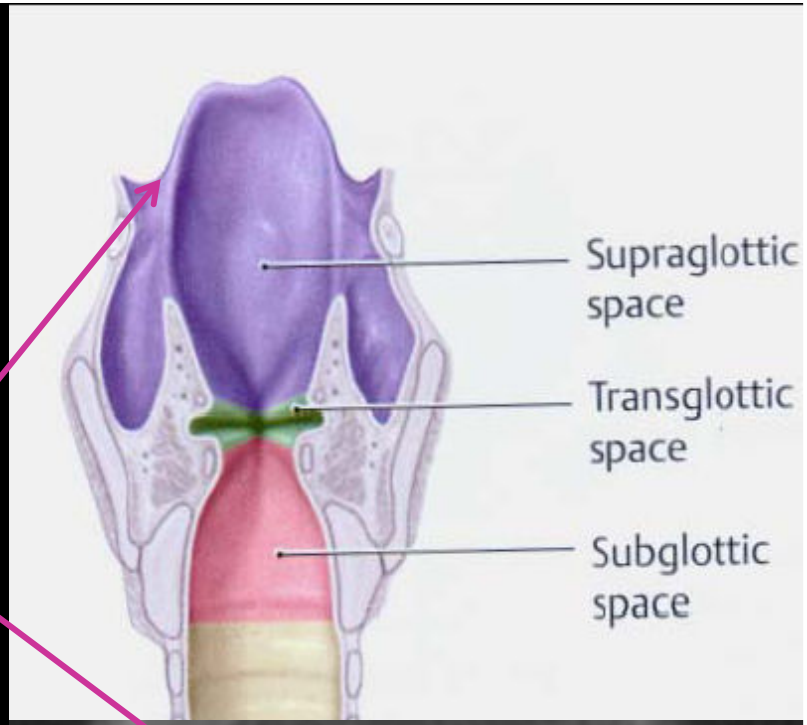


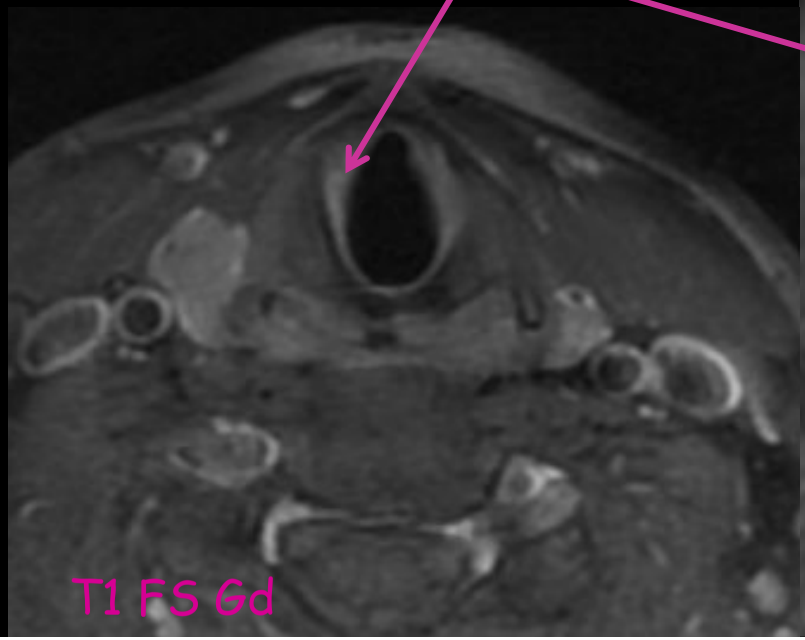
http://www.youtube.com/watch?v=Ri8bBhw9msQ

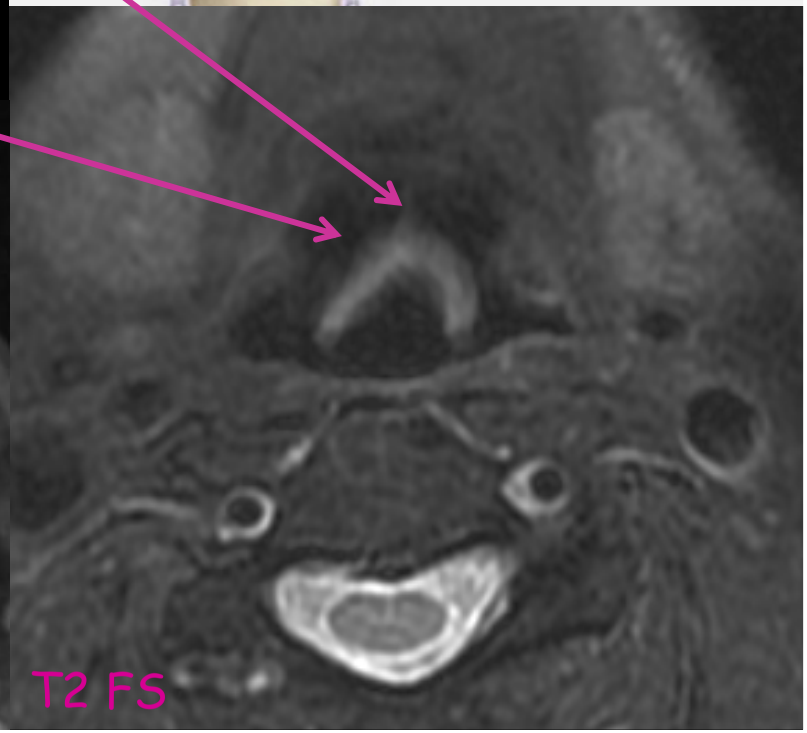
http://www.youtube.com/watch?v=h9M2ggdCWG0

Kõri

- Ulatub
  - Glossoepiglottilisest ja farüngoepiglottilisest voldist
  - Sõrmuskõhre alumise servani
  - Vallecula

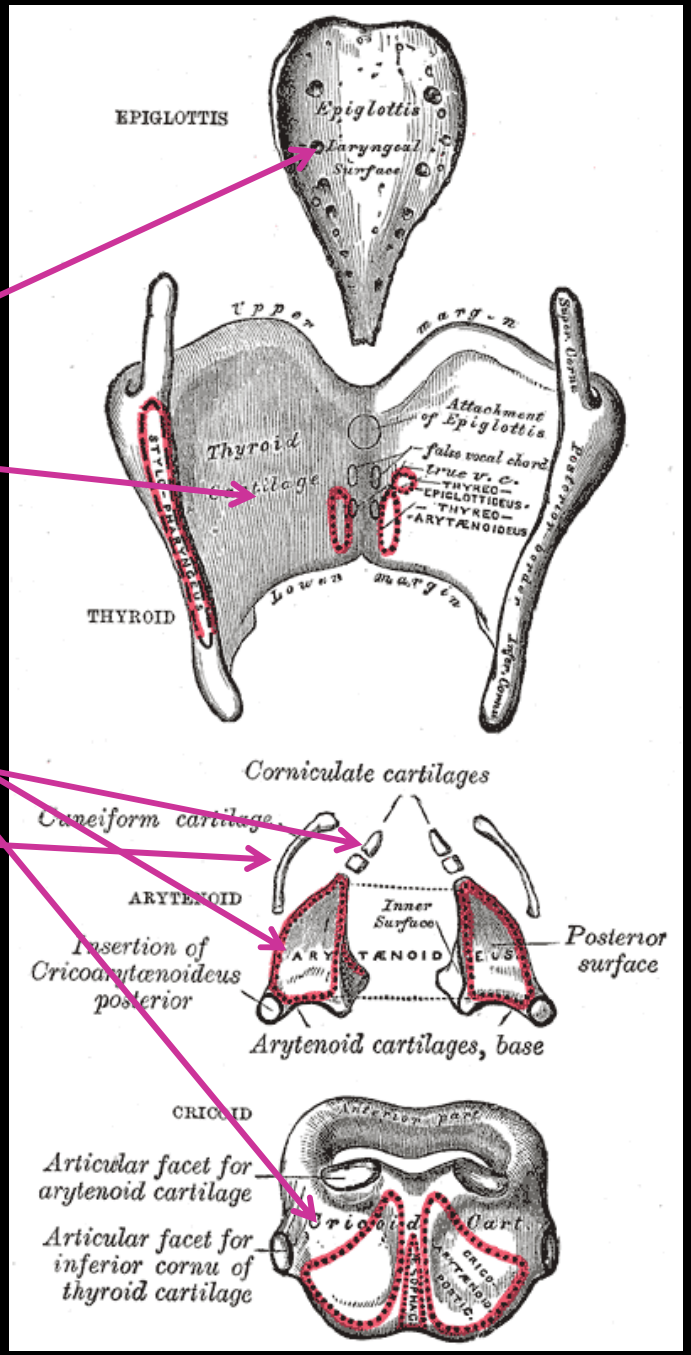






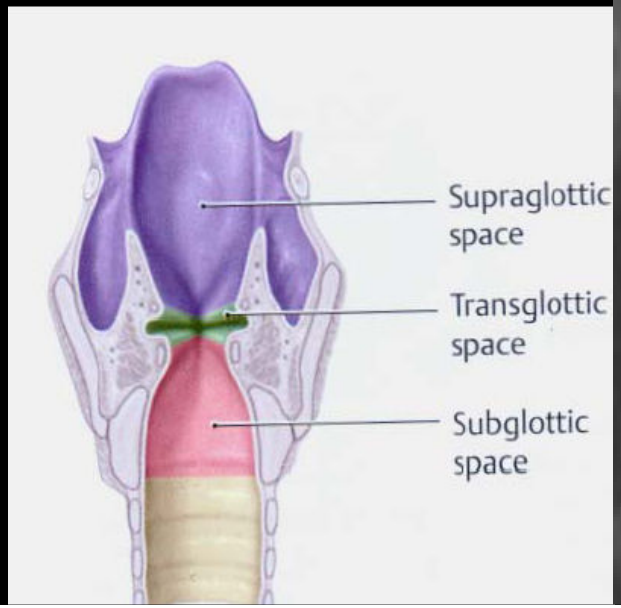
Kõri kõhred

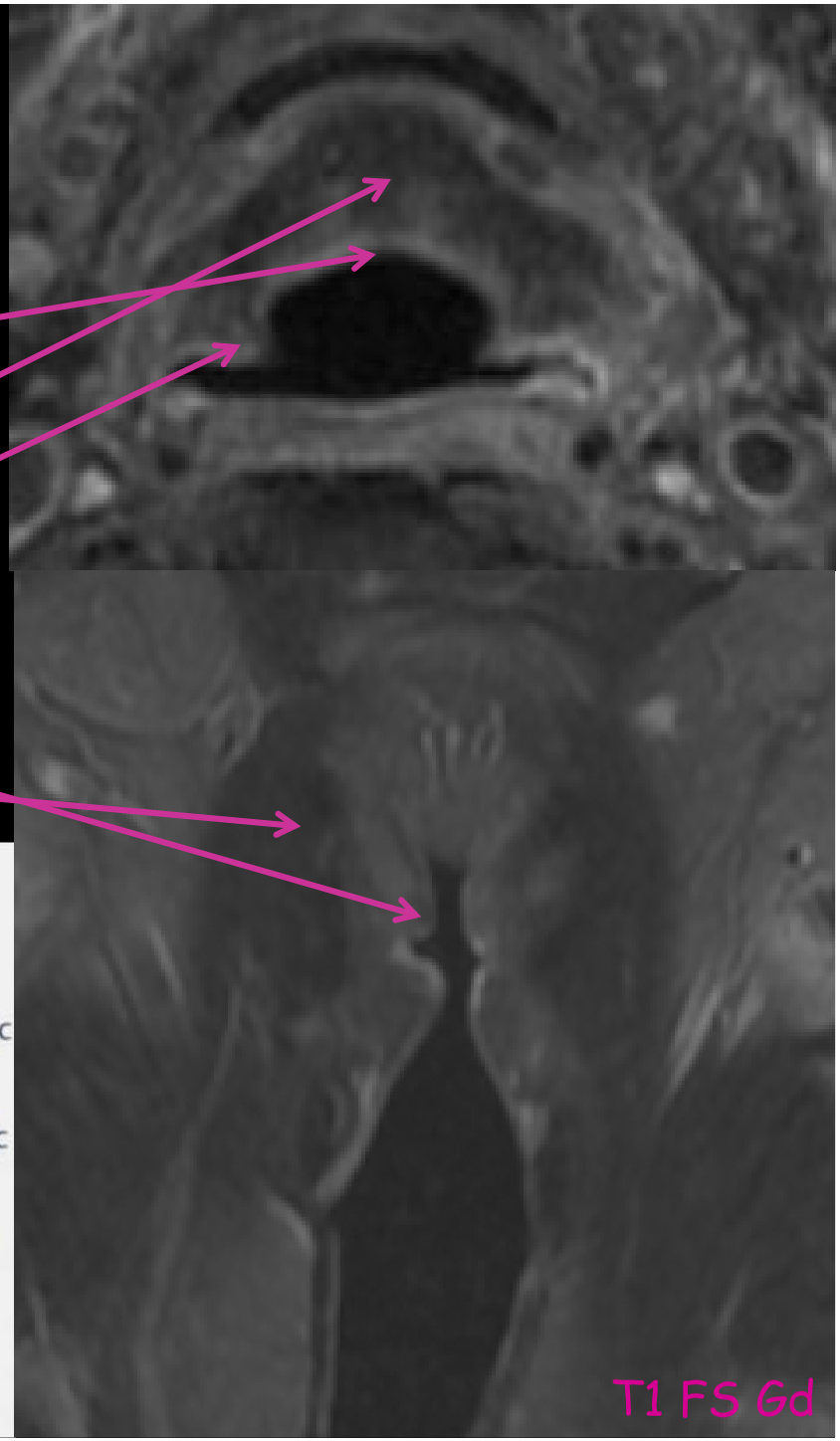
- Kõripealise kõhr *cart epiglottica*
- Kilpkõhr *cart thyreoidea*
- Sõrmuskõhr *cart cricoidea*
- Pilkkõhr *cart arytenoidea*
- Sarvikkõhr *cart corniculata*
- Talbkõhr *cart cuneiformis*
- Lisaks mõned ebapüsivad seesamkõhred



Kõri

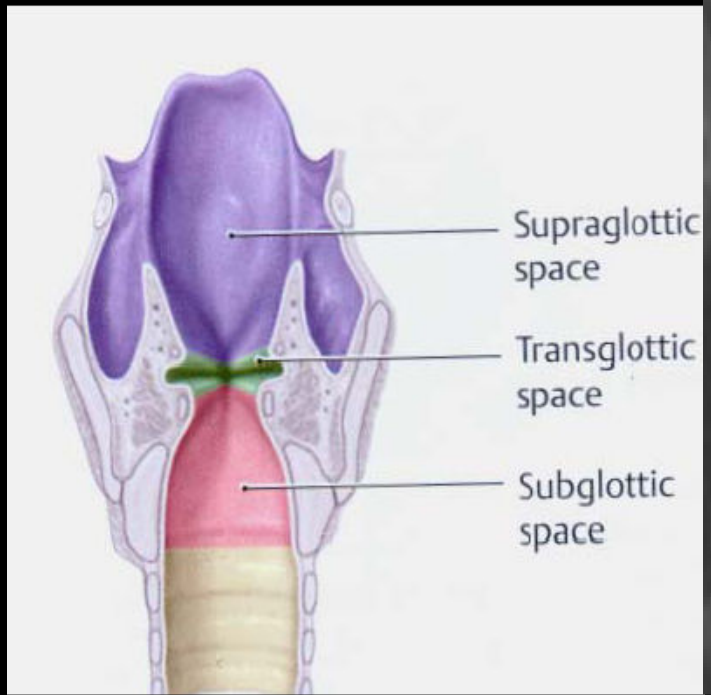
- Supraglottiline ruum
  - Epiglottis
  - Preepiglottiline ruum
  - Arüepiglottiline volt
  - Valehäälepaelad
  - Paraepiglottiline ruum

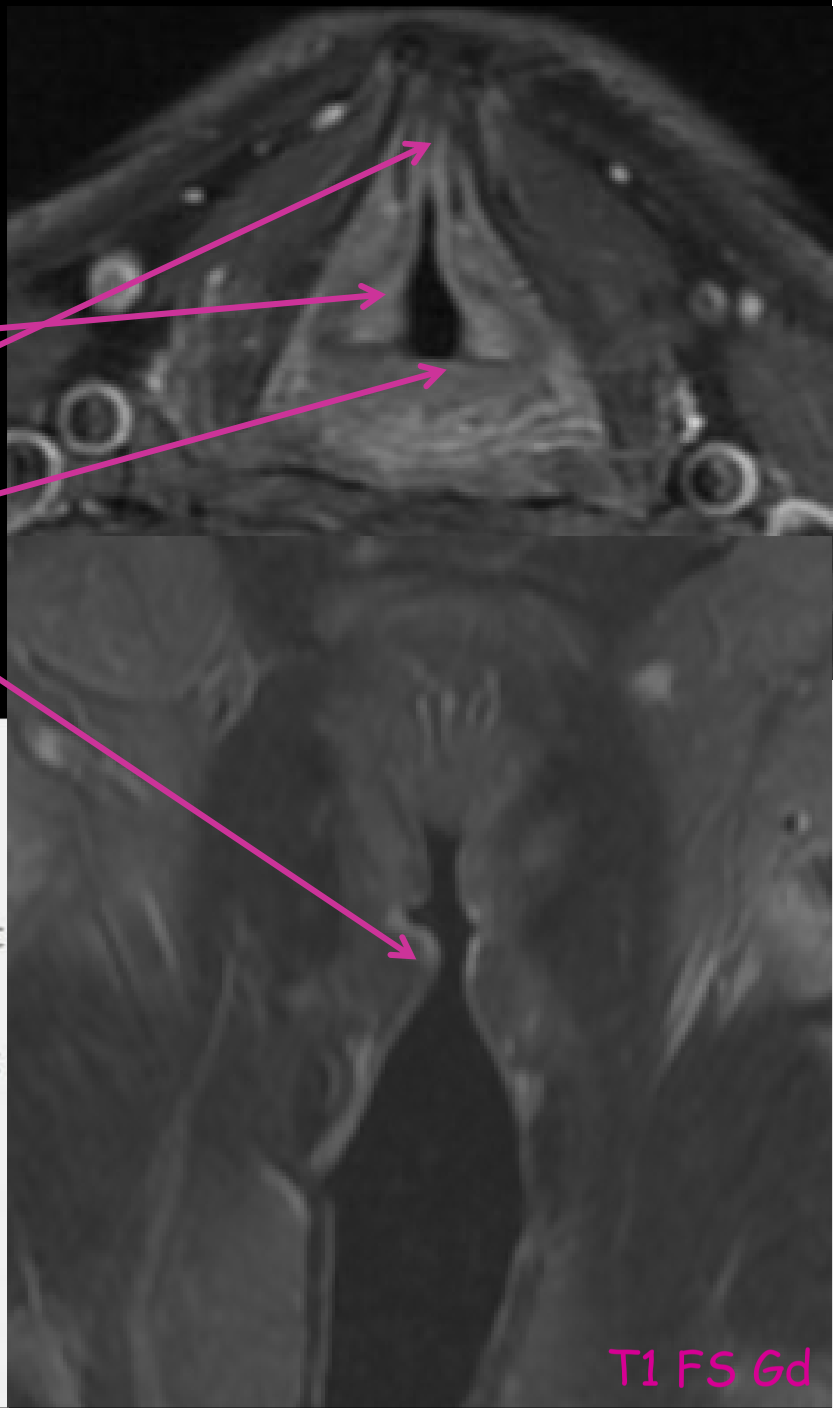




Kõri

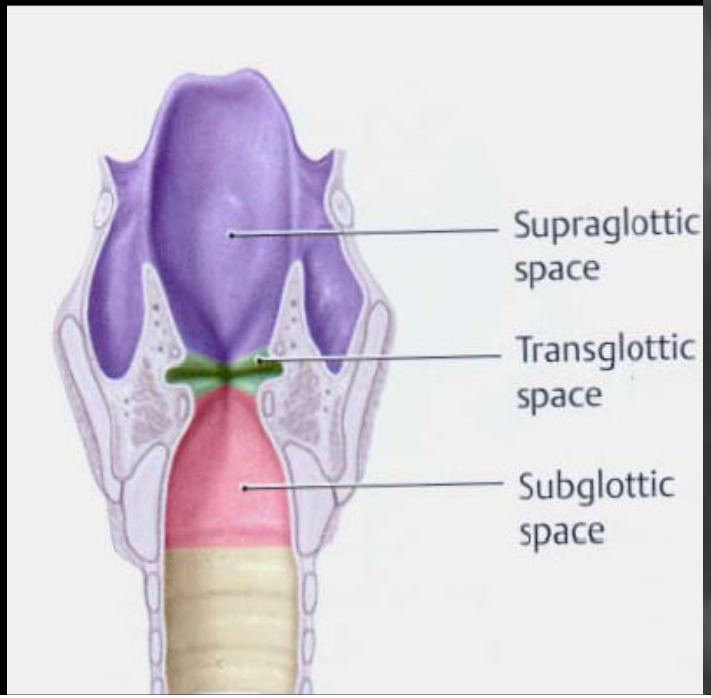
- (Trans)Glottiline ruum
  - Häälepaelad
  - Eesmine komissuur
  - Tagumine komissuur

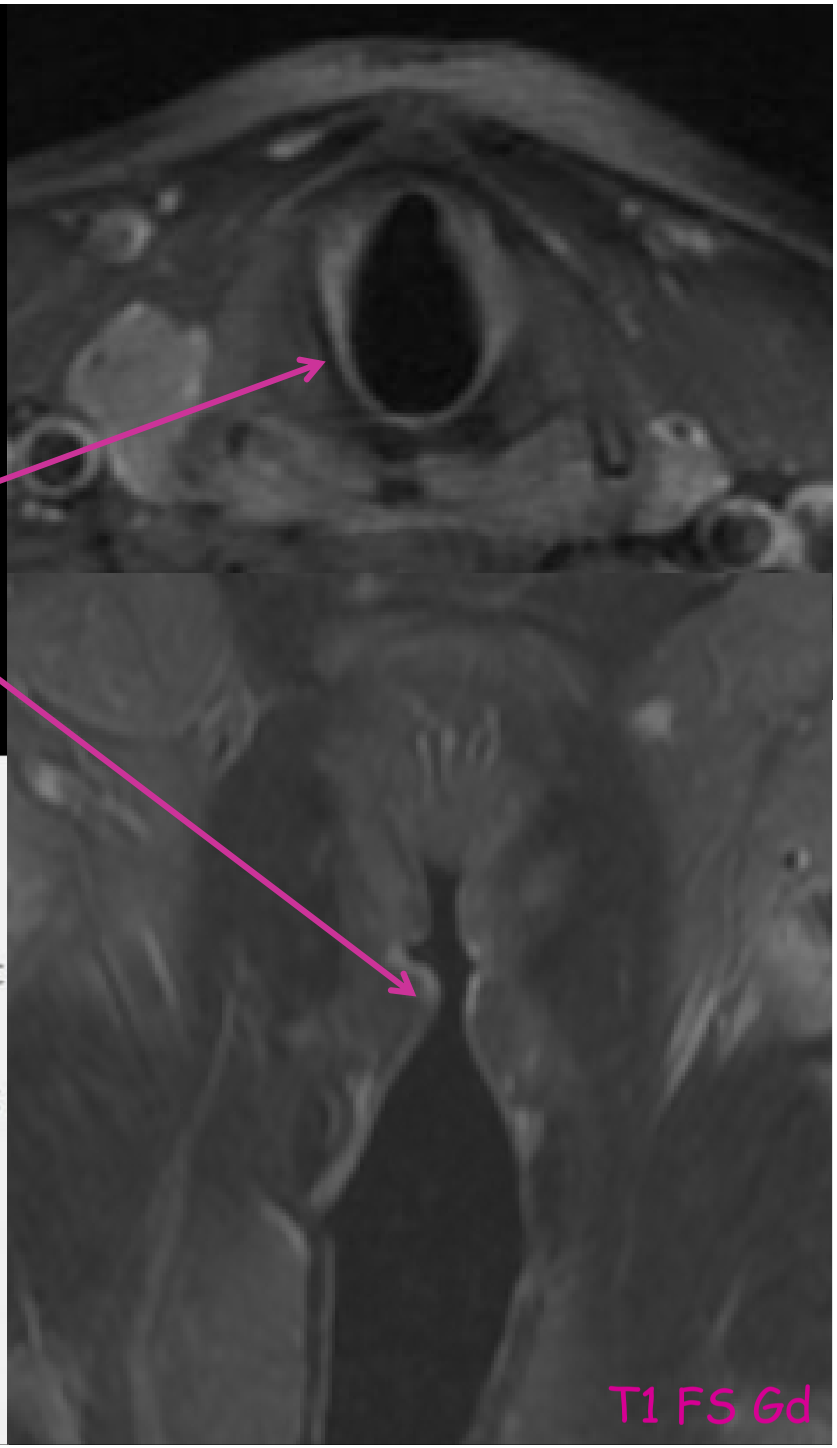




Kõri

- Subglottiline ruum
  - Häälepaelte all
  - Sõrmuskõhre alumise servani



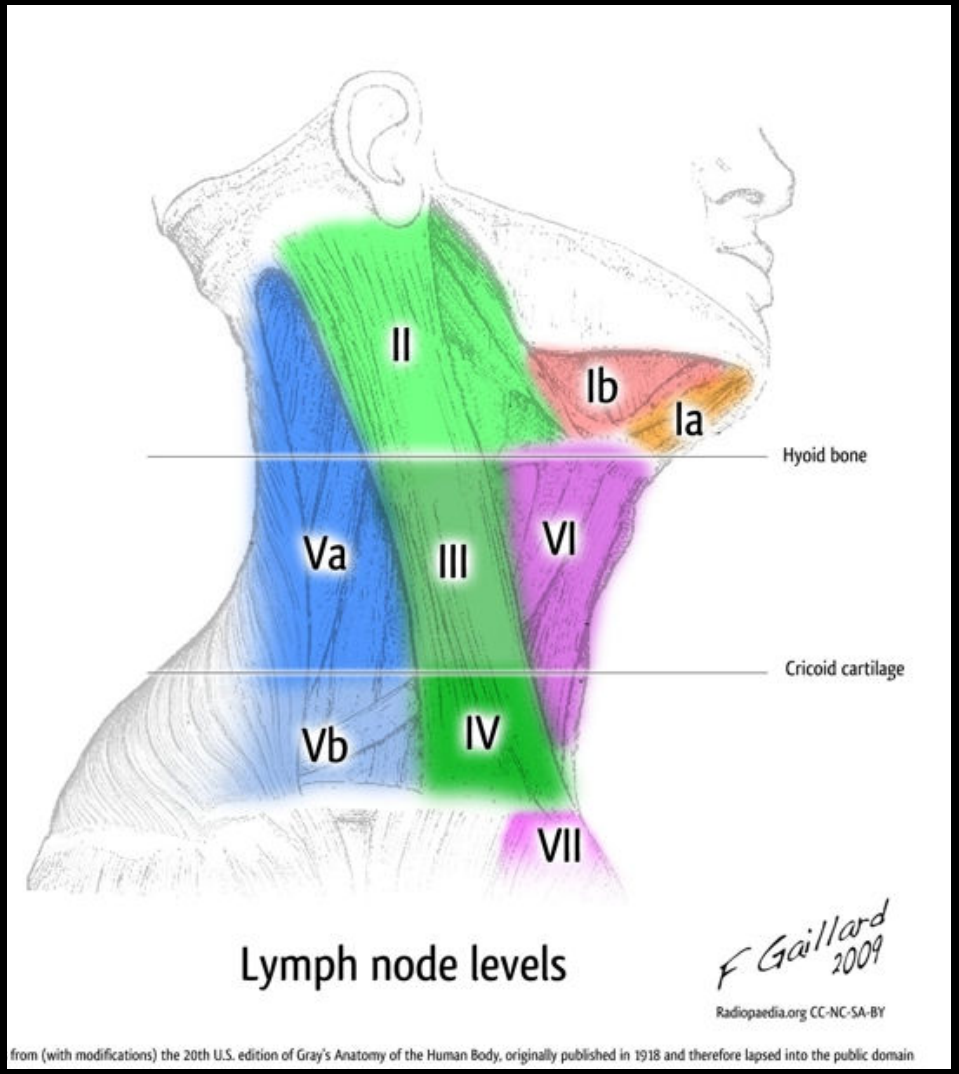


Kaela lümfisõlmede klassifikatsioon

AJCC and American Academy of Otolaryngology-Head and Neck Surgery

http://www.entnet.org/mktplace/NeckDissection.cfm

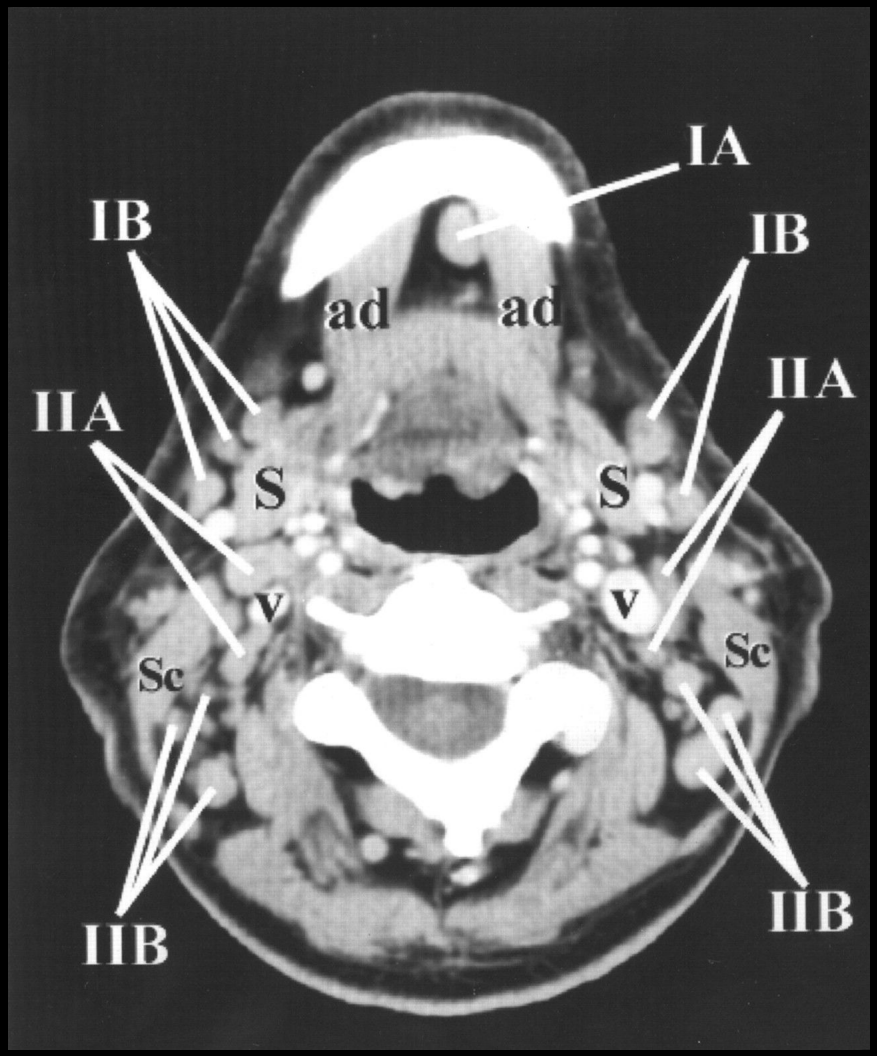
Kaela lümfisõlmed



- Kokku I-VII taset
- Lisaks
  - Supraklavikulaarsed
  - Retrofarüngeaalsed
  - Parootise piirkonna

IA, IB

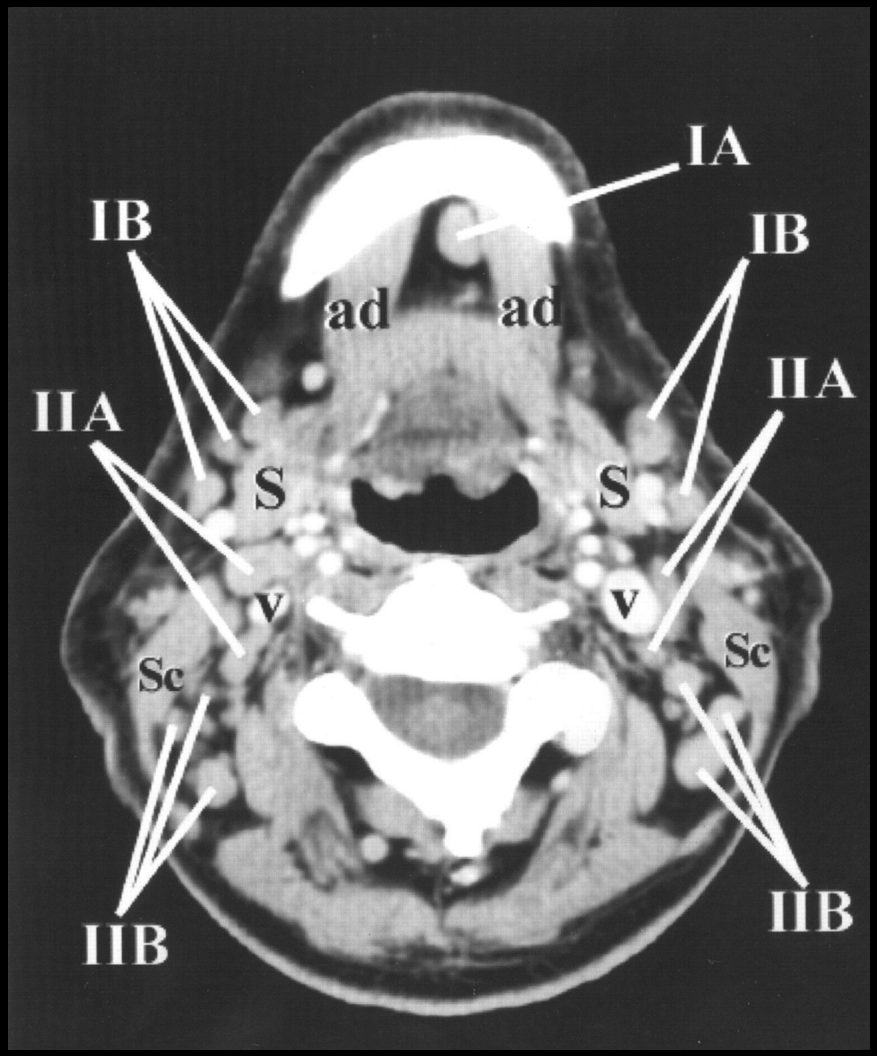
- Tase I
  - Keeleluust kõrgemal
  - M. Myelohyoideusest allpool
  - Submandibulaarnäärme ees
- Tase IA: submentaalne
  - M. Digastricuse´te vahel
- Tase IB: submandibulaarne
  - IA sõlmedest taga-lateraalsel



Som P M et al. AJR 2000;174:837-844

IIA, IIB

- Tase II: ülemine jugulaargrupp
  - Koljupõhimikust keeleluuni
  - Submandibulaarnäärme taga
  - Lateraalsel ees m. Sternocleidomastoideus
- Tase IIA:
  - Ümber jugulaarveeni
- Tase IIB:
  - Jugulaarveenist tagapool, vahel peab olema rasv



Som P M et al. AJR 2000;174:837-844

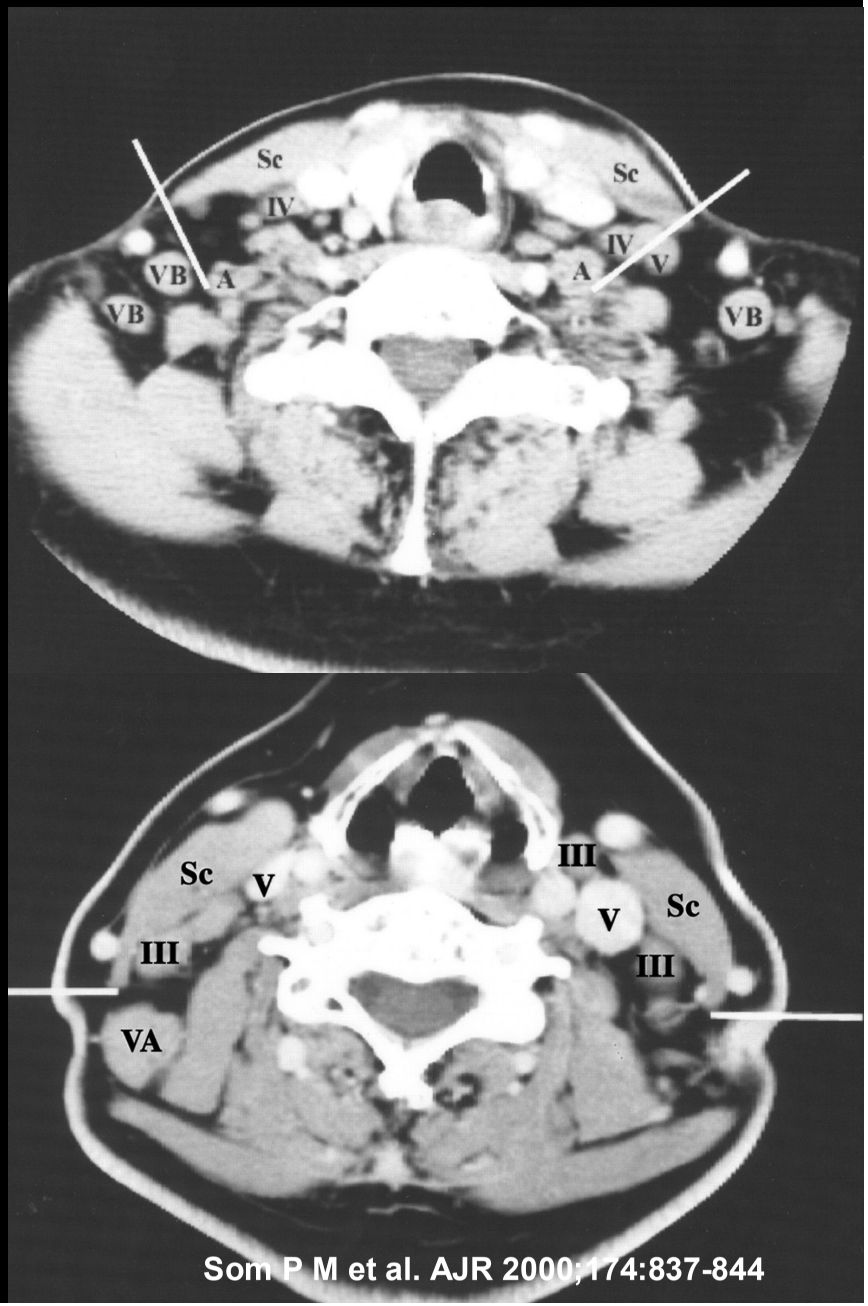
III

- Tase III: keskmised jugulaargrupp
  - Keeleluust sõrmuskõhreni
  - M. Sternocleidomastoideuse taga

Som P M et al. AJR 2000;174:837-844

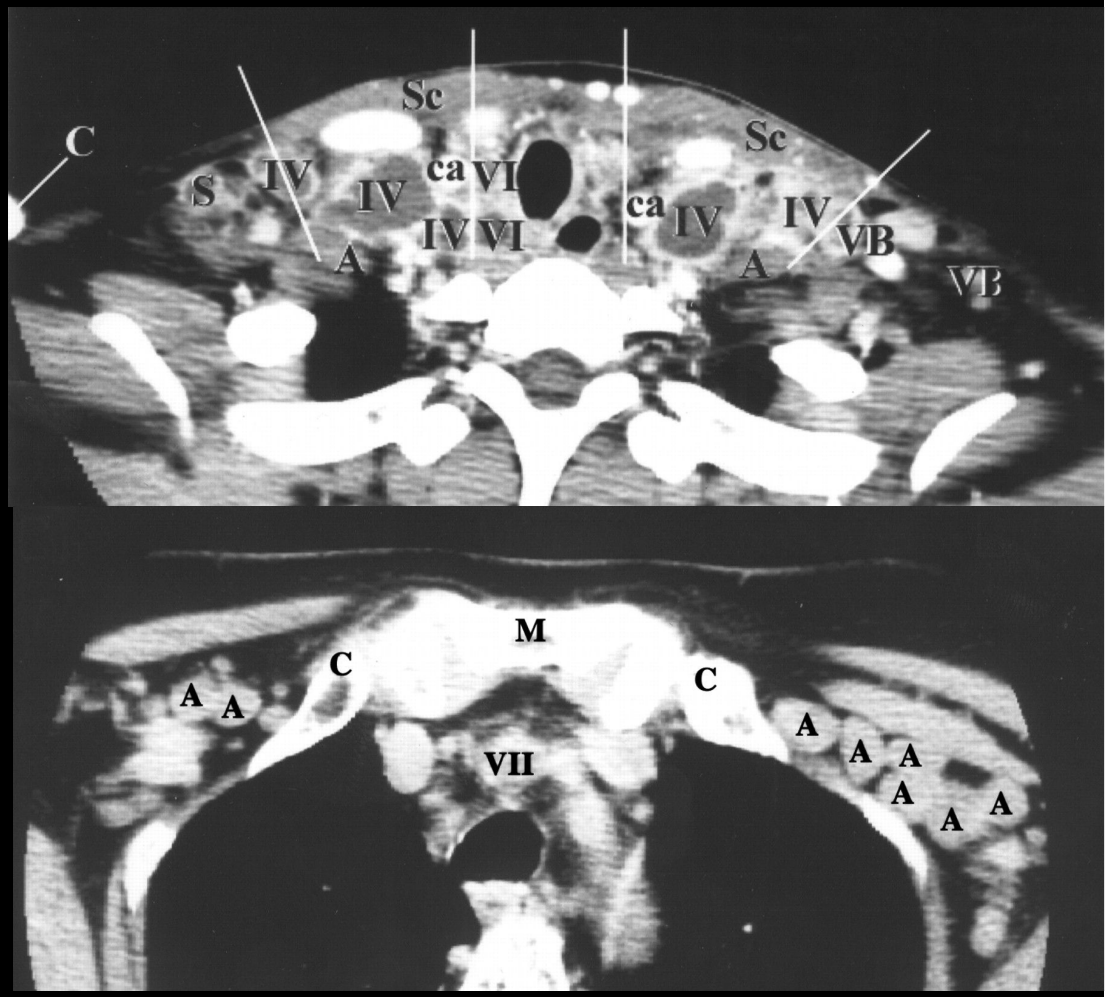
IV, V

- Tase IV: alumine jugulaargrupp
  - Sõrmuskõhrest rangluuni
  - Unearteritest lateraalsemal
- Tase V: tagumise kolmnurga grupp
  - M. Sternosleidomastoideuse taga
  - Koljupõhimikust rangluuni
  - Tase VA ja VB
    - » Sõrmuskõhrest üleval- ja allpool



VI, VII

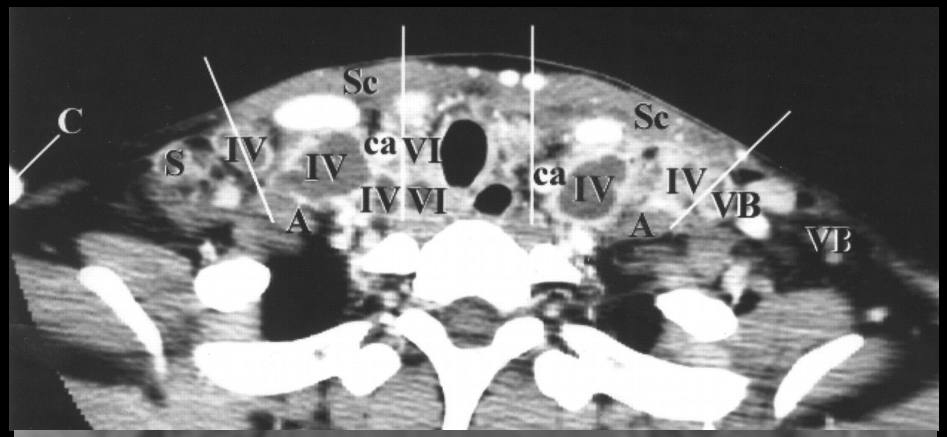
- Tase VI: eesmine grupp
  - Unearterite vahel
  - Keeleluust manumbriumini
- Tase VII: ülemised mediastinaalsed sõlmed
  - Unearterite vahel allpool manumbriumi

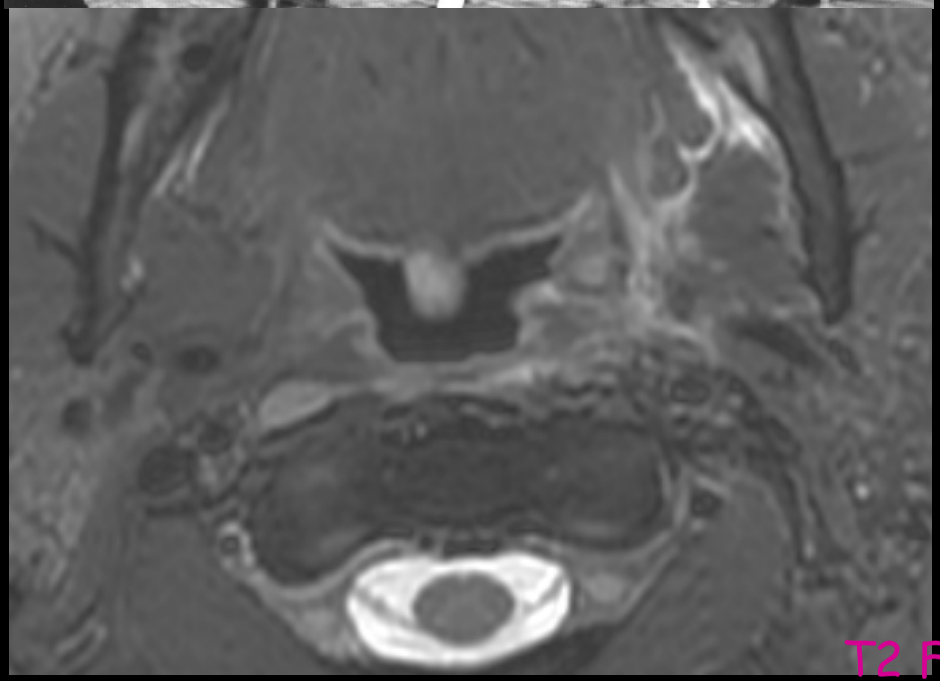


Som P M et al. AJR 2000;174:837-844

Supraklavikulaarsed, retrofarüngeaalsed, parootise piirkonna sõlmed

- Supraklavikulaarsed:
  - Rangluu kõrgusel
  - Unearterist lateraalsemal
- Retrofarüngeaalsed:
  - 2 cm koljupõhimikust
  - Unearteritest mediaalsemal
- Parootise piirkonna sõlmed





Som P M et al. AJR 2000;174:837-844

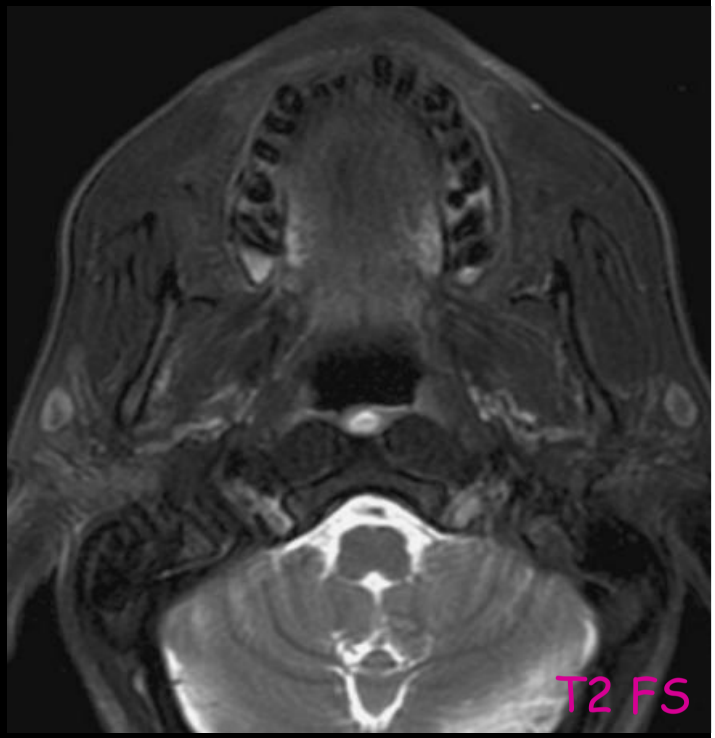
Kaela piirkonna arengulised muutused

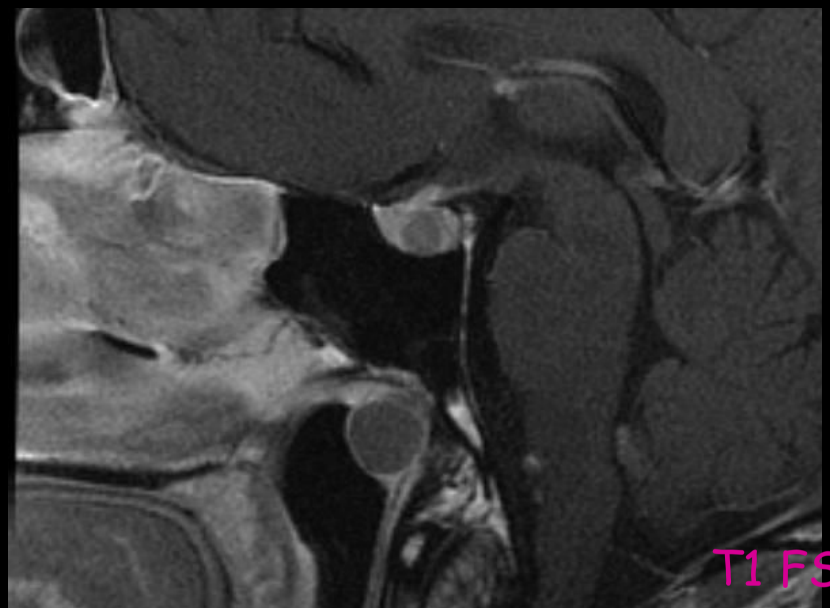
- Thornwaldt´i tsüst
- Türeoglossaaljuha tsüst
- Keele kilpnääre
- Lõpuspilu tsüstid
- Lümfaatiline malformatsioon

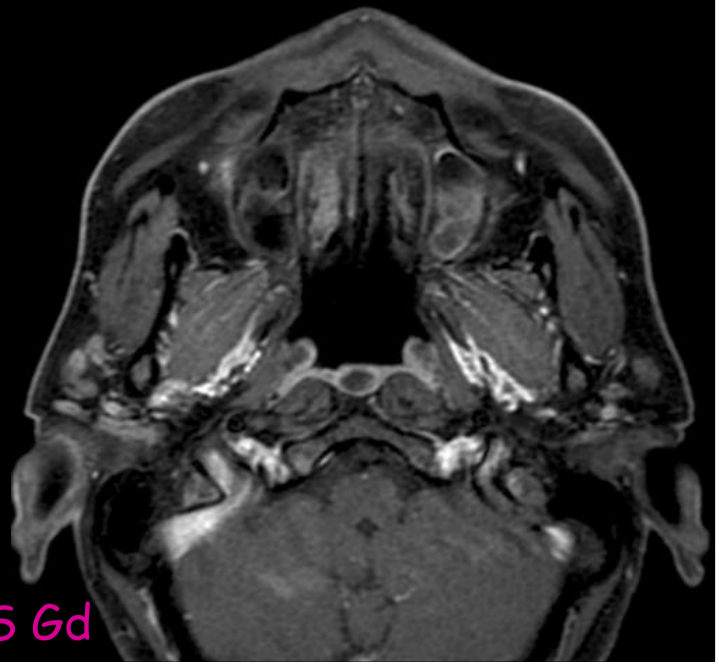
MRT kontrastainega on valikmeetod
kaela masside diagnoosimisel ja diferentseerimisel

Tornwaldt´i tsüst

- Embrüonaalkoe jääk
- Healoomuline keskjoone tsüst
- Ninaneelus
- Kaetud limaskestaga
- 5% MR uuringul

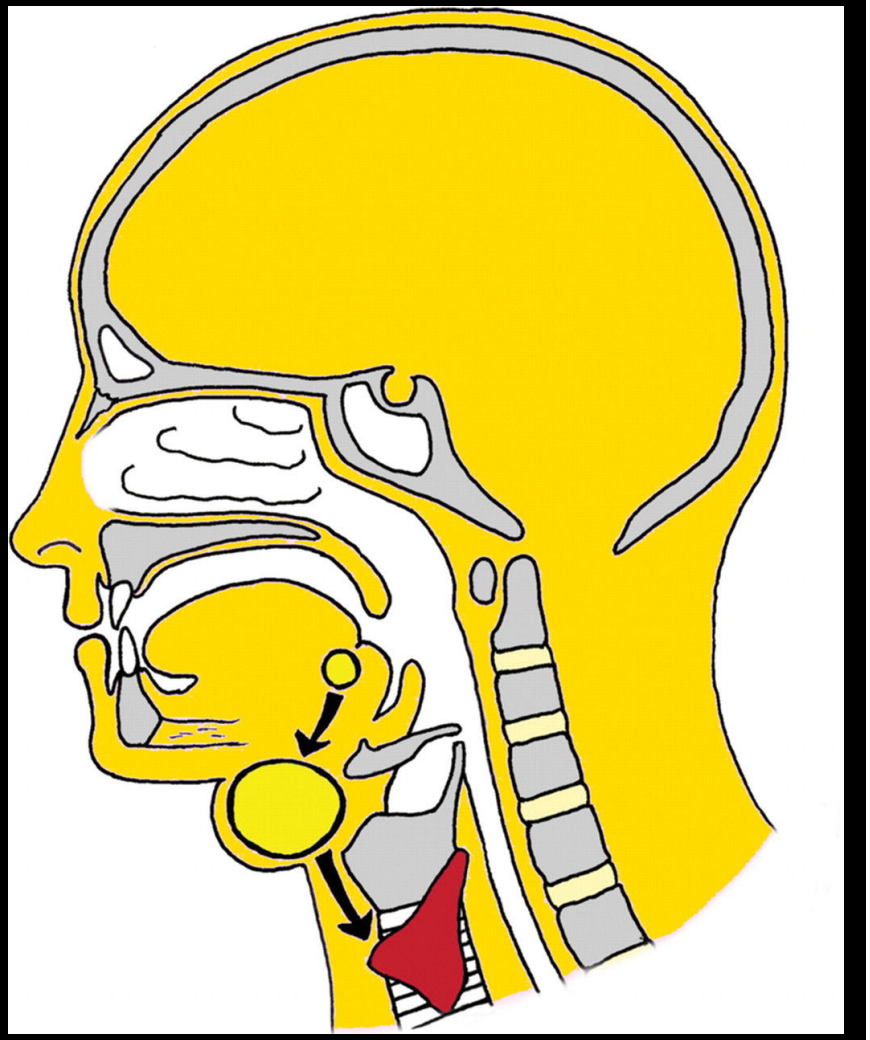






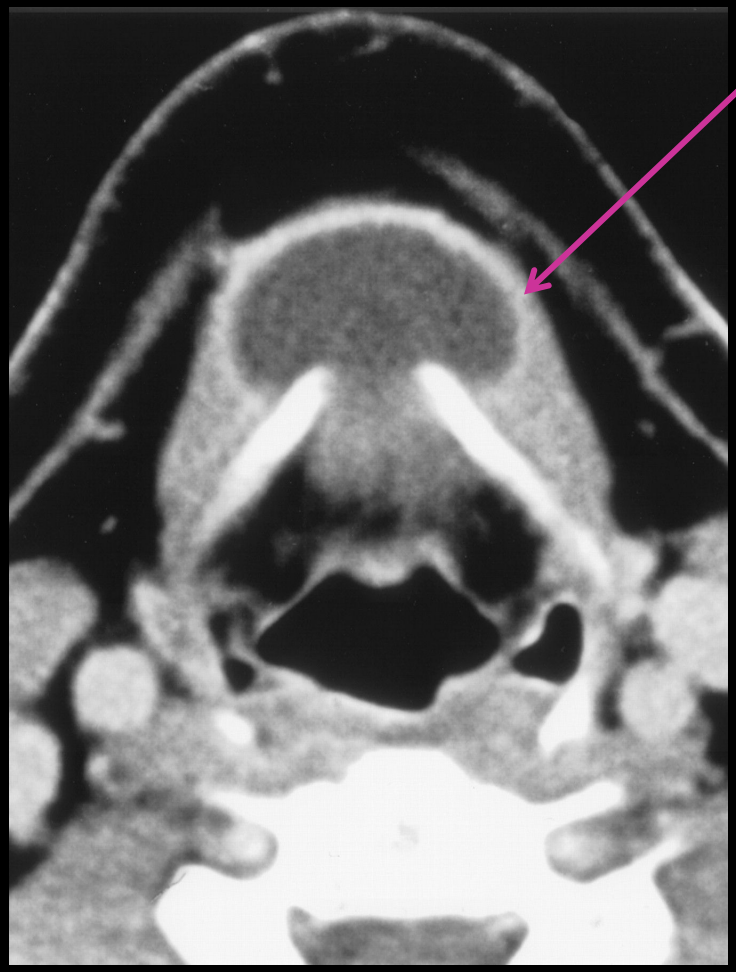
Türeoglossaaljuha tsüst

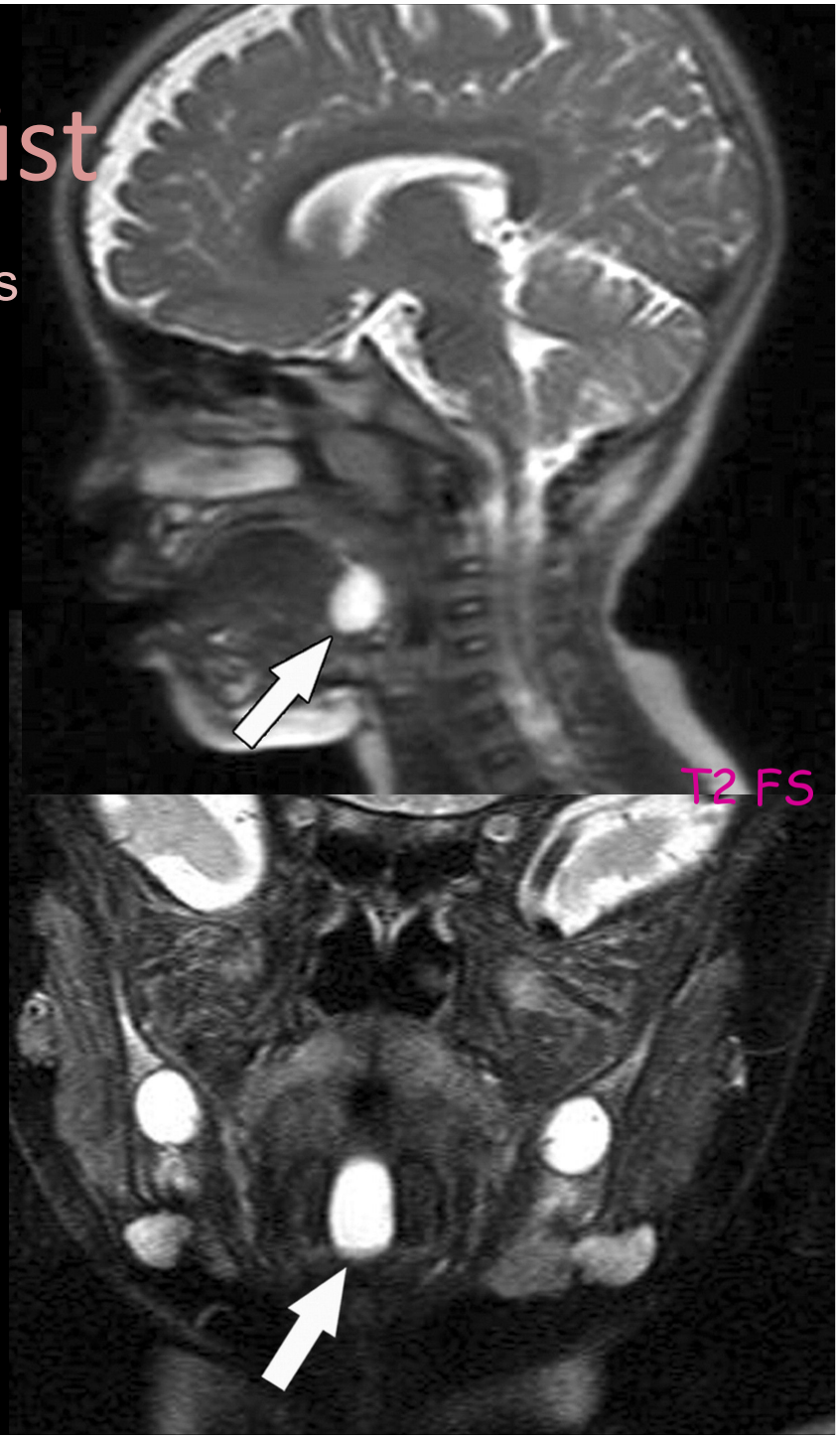
- Jääk juhast
- Keskjoone tsüst, mis on keeleluu aluse lihase sees – “küüne märk”
- Kõige sagedasem kaasasündinud tsüst - 70% tsüstidest
- Oluline seotus keeleluuga
  - üleval 20-25 %
  - keeleluu kõrgusel 15-50 %
  - allpool 25-65 %



Meuwly J et al. Radiographics 2005;25:931-948

Türeoglossaaljuha tsüst

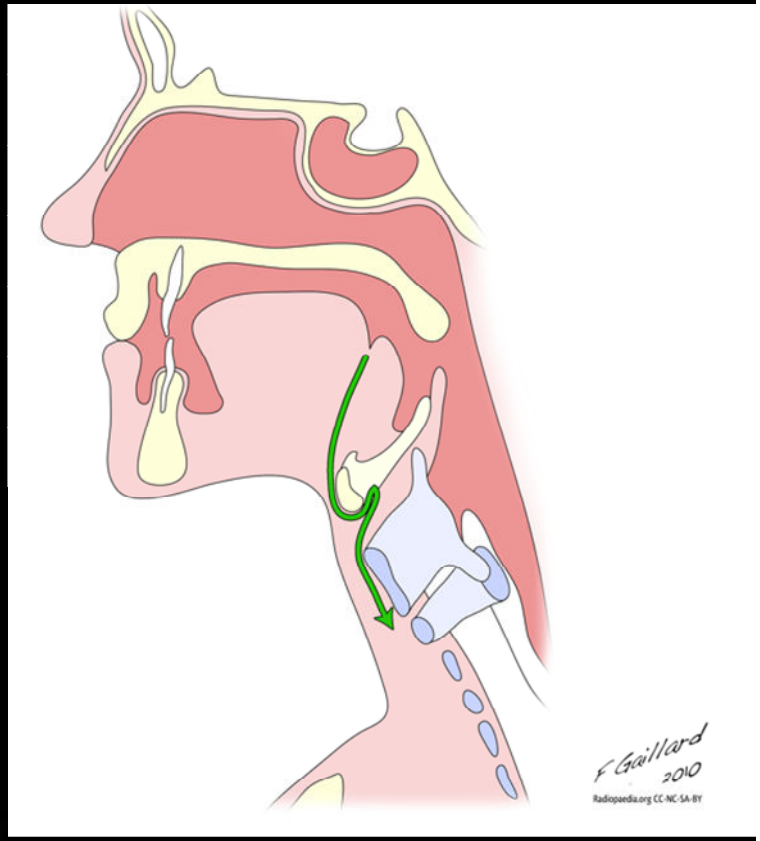




Meuwly J et al. Radiographics 2005;25:931-948

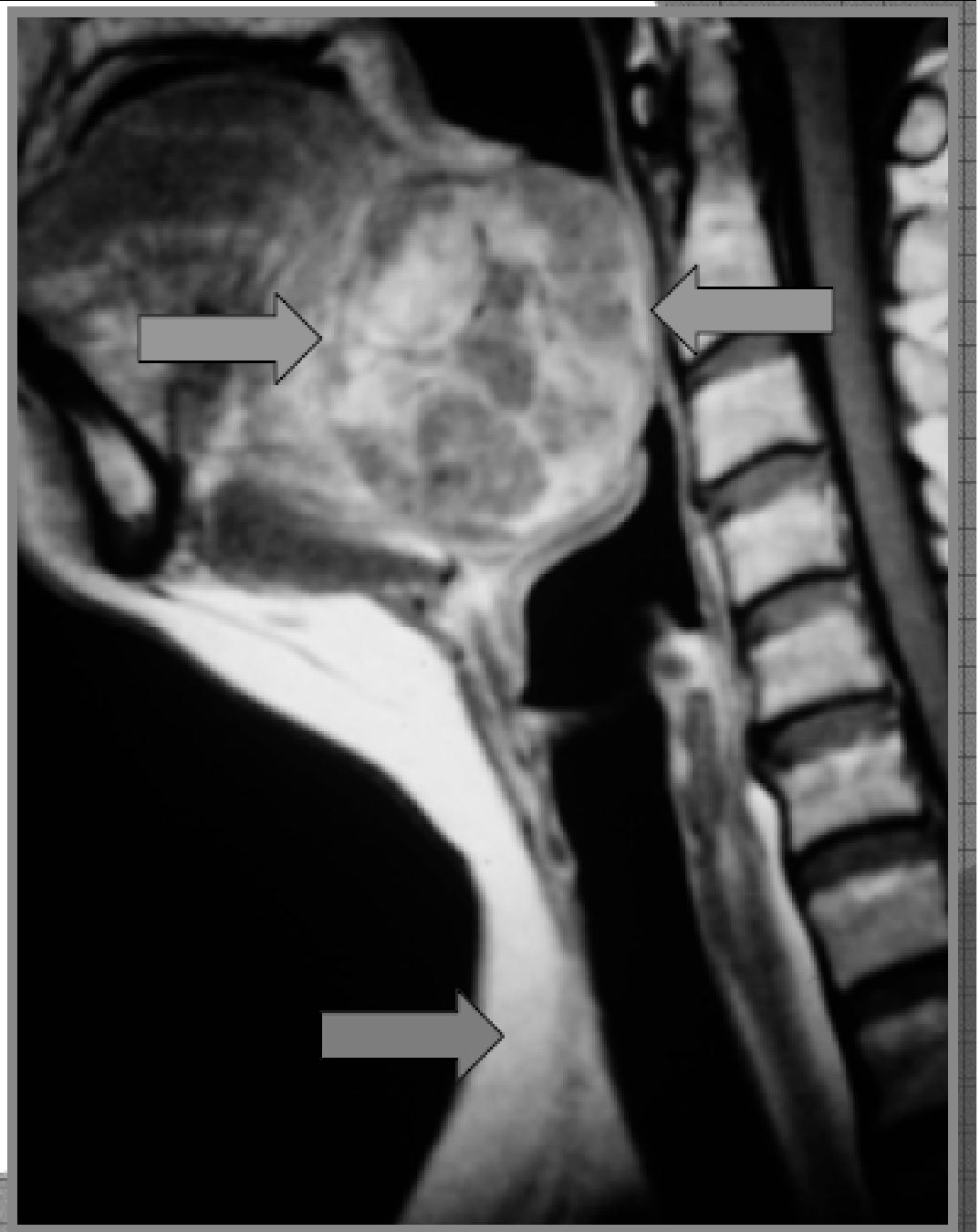
Keele kilpnääre

- Ektoopiline kilpnääre
- Keelepära või suupõhja piirkonnas
- Kaudaalne migratsioon häiritud



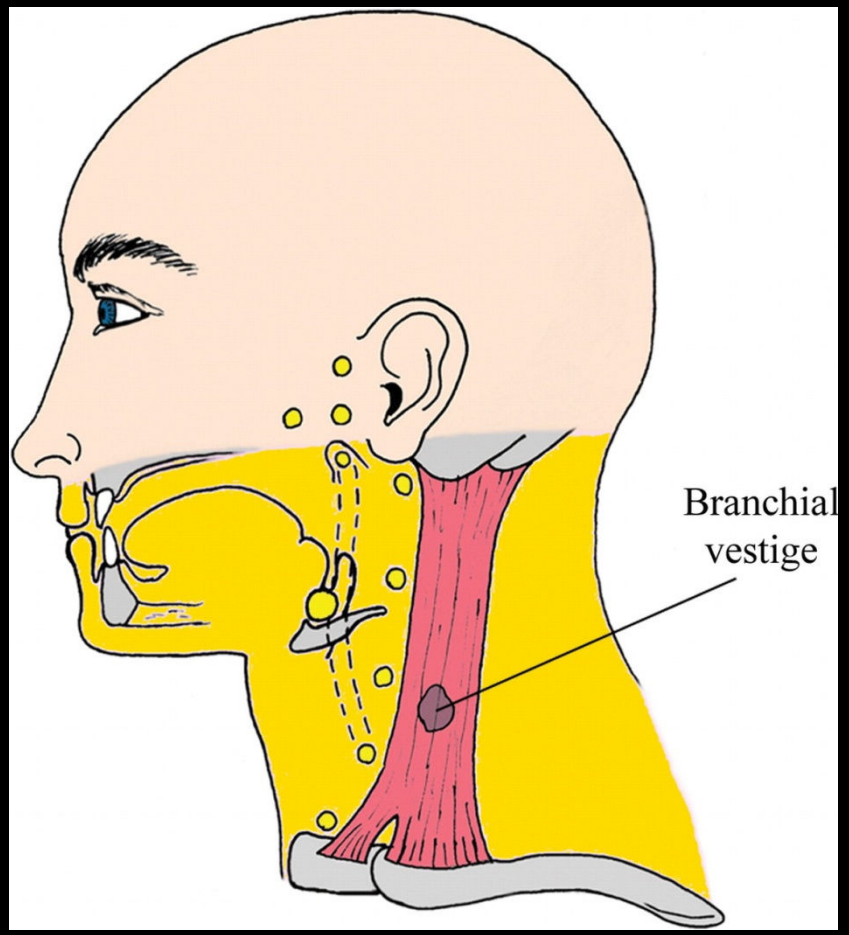
Radiopaedia.org

Lingual thyroid gland with goiter formation



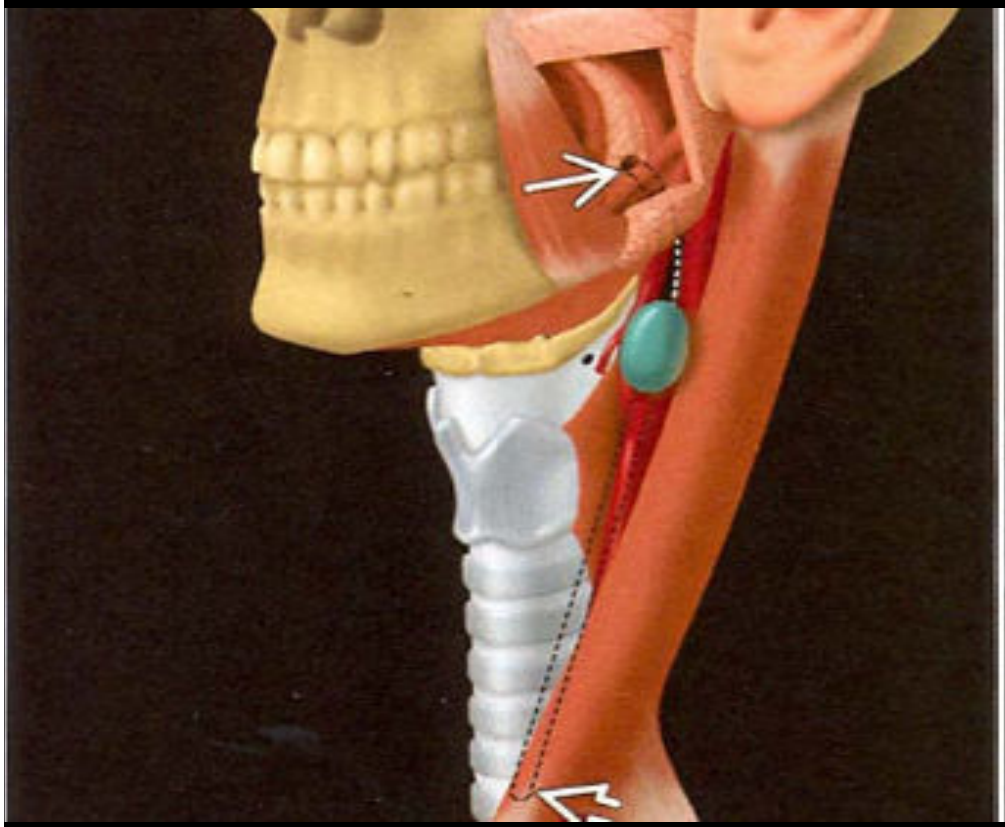
Lõpuspilu tsüstid

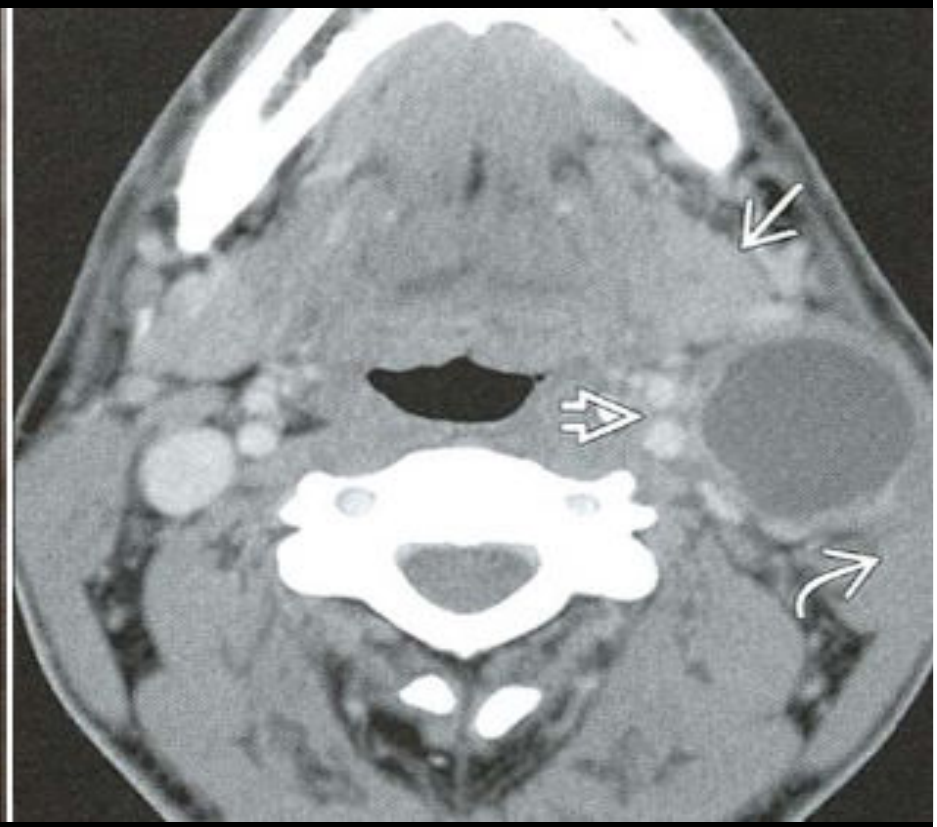
- Lõpuskaare sulgumise häire
- Lõpuskaartest arenevad näo, kaela ja neelu koed
  - Tsüst – ei ole sisemist ega välimist ühendust 75%
  - Siinus – ühe ühendusega kanal
  - Fistel – nii sisemine kui välimine ühendus



Meuwly J et al. Radiographics 2005;25:931-948

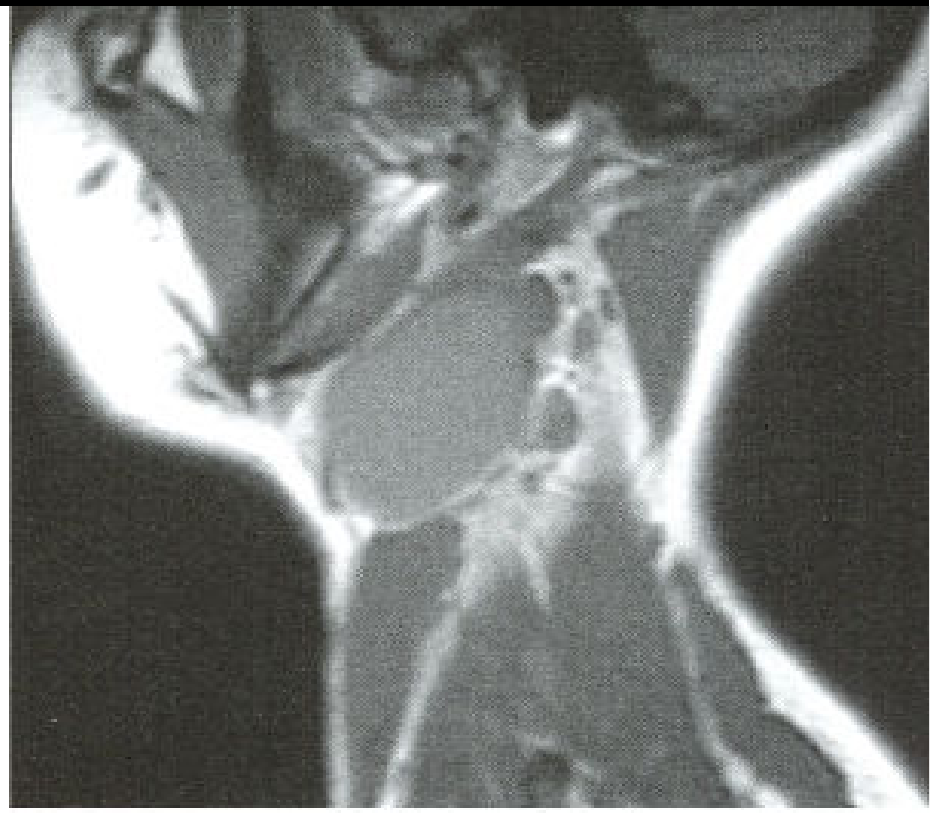
2. lõpuspilu tsüst





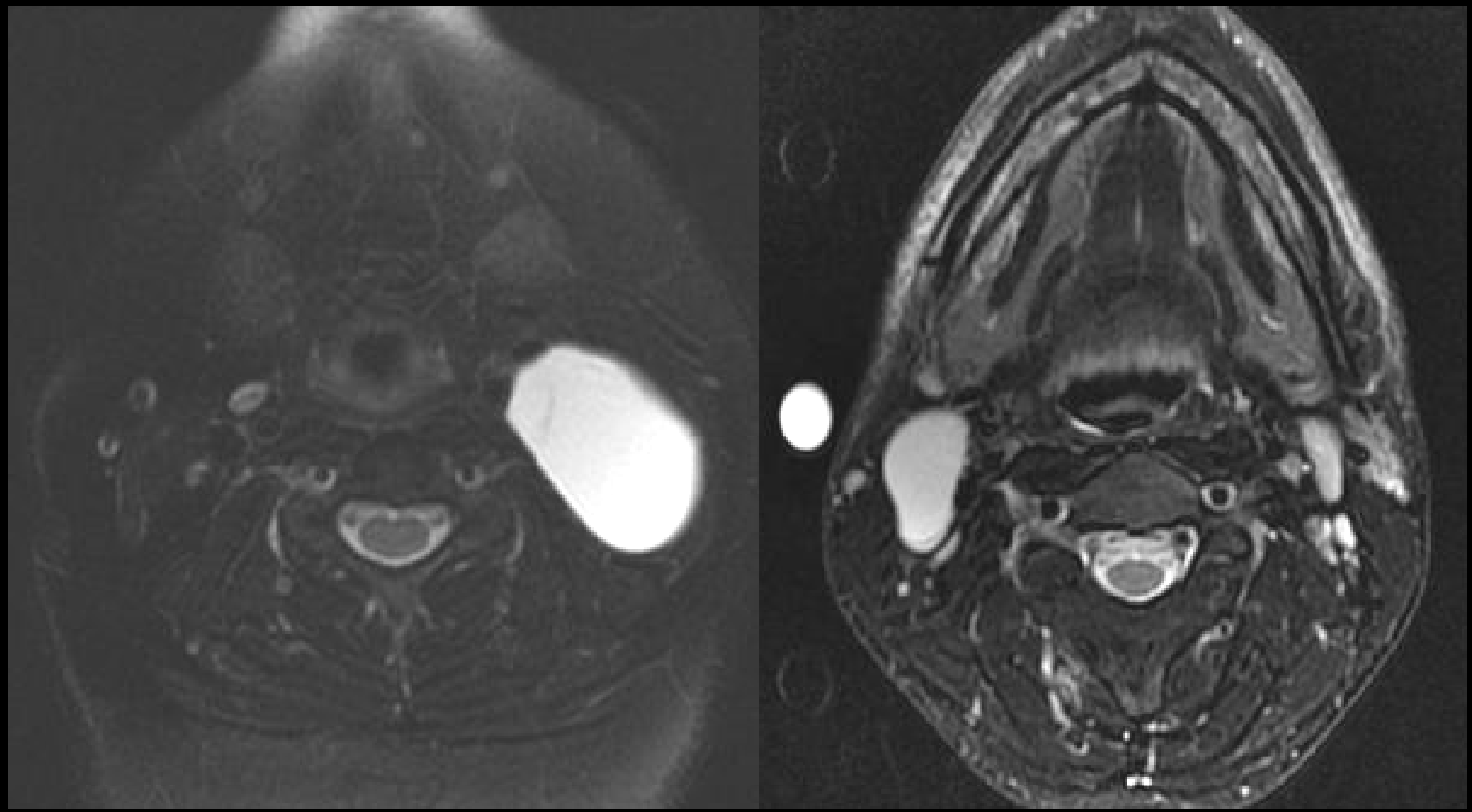
- Paikneb ühisunearterist lateraalsemal ja m. sternocleidomastoideusest eespool
- Mandibula nurga taga
- Võib paikneda neelukaarest kuni supraklavikulaarpiirkonnani

2. lõpuspilu tsüst



Kõige sagedasem lõpuspilu tsüst ja
sageduselt teine tsüstjas moodustis kaela piirkonnas
Võib olla nii tsüst, fistel kui siinus

2. lõpuspilu tsüst



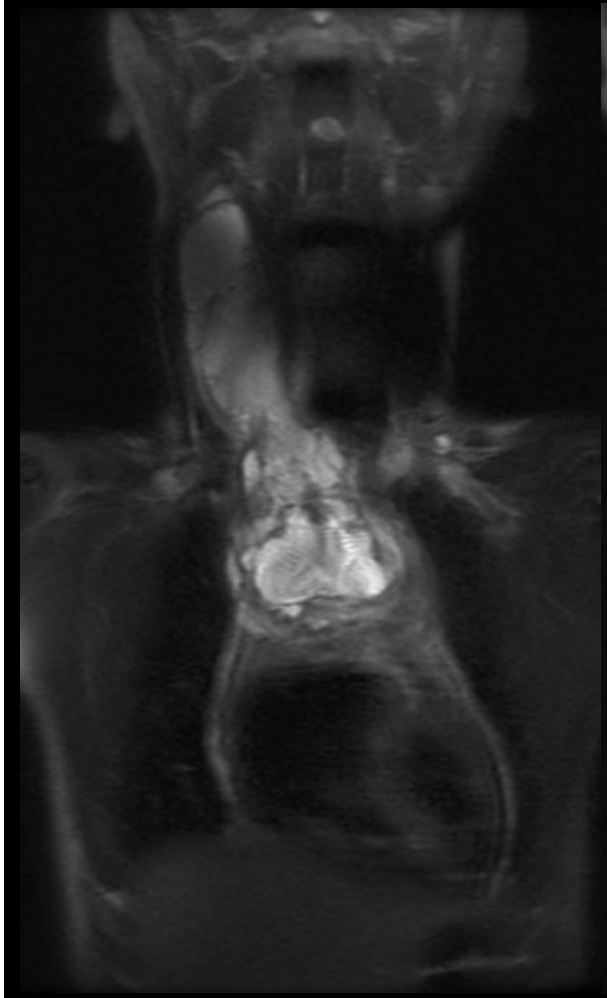
T2 FS

Lümfaatiline malformatsioon

- Tsütiline või multitsüstiline epiteeliga vooderatud moodustis
- Sisaldab lümfi
- Sageli asümtomaatiline
- Ei austa ruumide piire
- “Lümfangioom”, “tsüstiline hügroom”: ei ole kasvaja

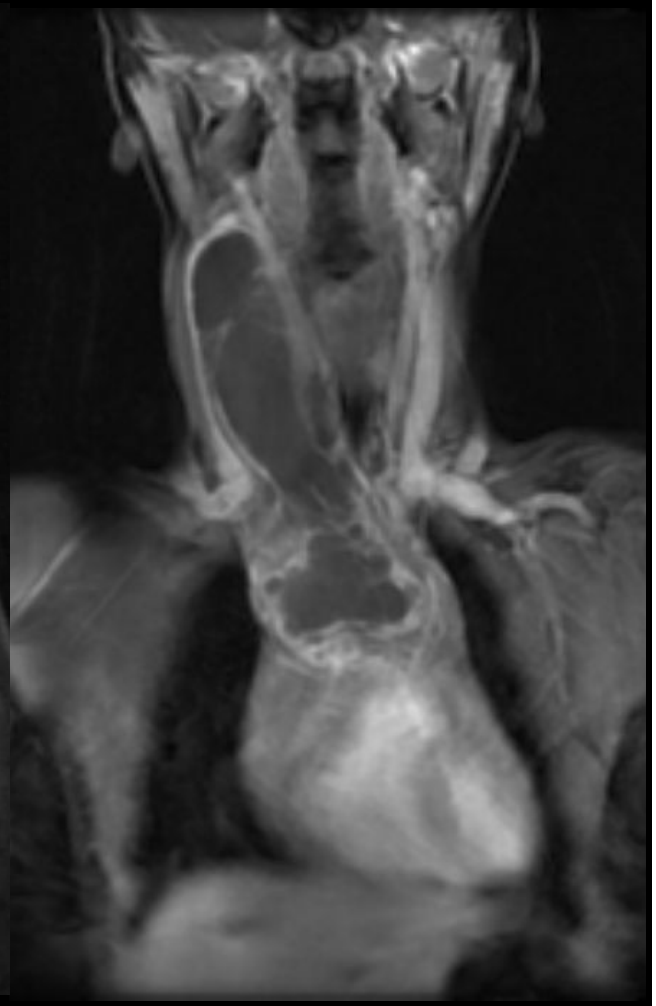
Mediastinal Masses in Children S. H. Ranganath et al, AJR:198, 2012

MR



T2 FS cor

T2 FS sag



T1 postGd cor

KOJU KAASA

- ANATOOMIA
- ANATOOMIA
- ANATOOMIA

Kirjandust

- Imaging of the Mylohyoid Muscle: Separation of Submandibular and Sublingual Spaces Mika Otonari-Yamamoto, *AJR May 2010 194:W431-W438; doi:10.2214/AJR.09.3516*
- Imaging-Based Nodal Classification for Evaluation of Neck Metastatic Adenopathy Peter M. Som, Hugh D. Curtin, and Anthony A. Mancuso *AJR March 2000 174:837-844*
- Relative Value of MR Imaging as Compared with CT in the Diagnosis of Inflammatory Paranasal Sinus Disease Stefan Hähnel et al, *Radiology January 1999 210:1 171-176*
- From the Archives of the AFIP: Congenital Cystic Masses of the Neck: Radiologic-Pathologic Correlation Kelly K. Koeller et al, *Radiographics January 1999 19:1 121-146*
- AJCC and American Academy of Otolaryngology-Head and Neck Surgery: http://www.entnet.org/mktplace/NeckDissection.cfm
- Imaging Anatomy