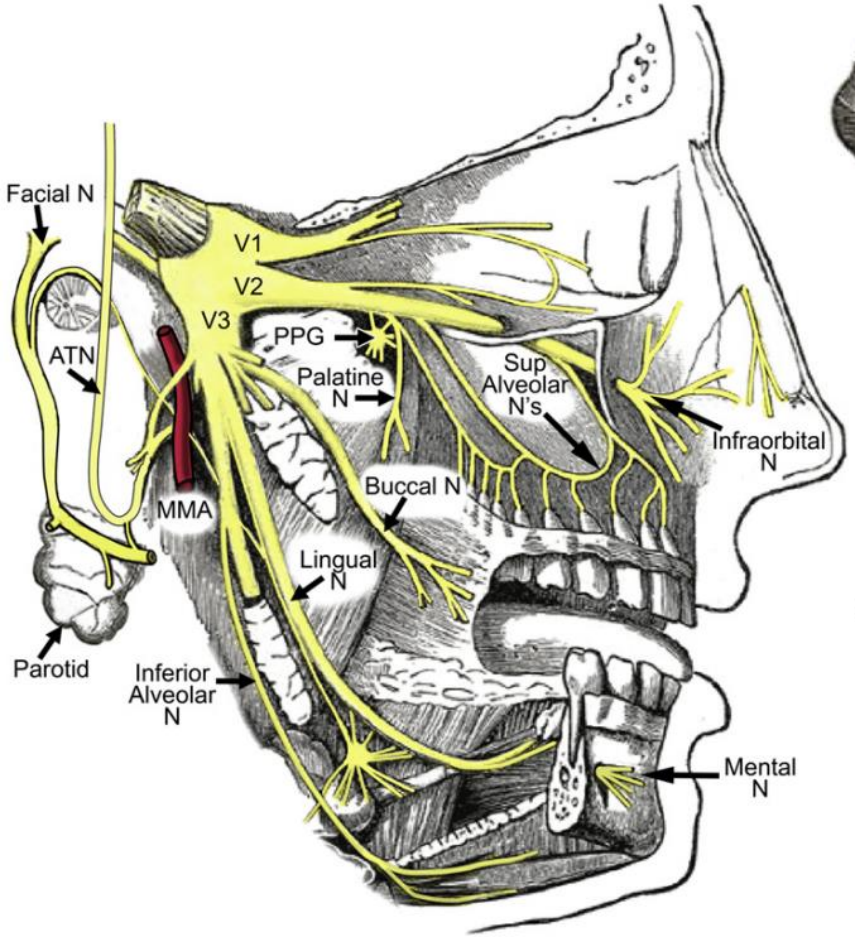
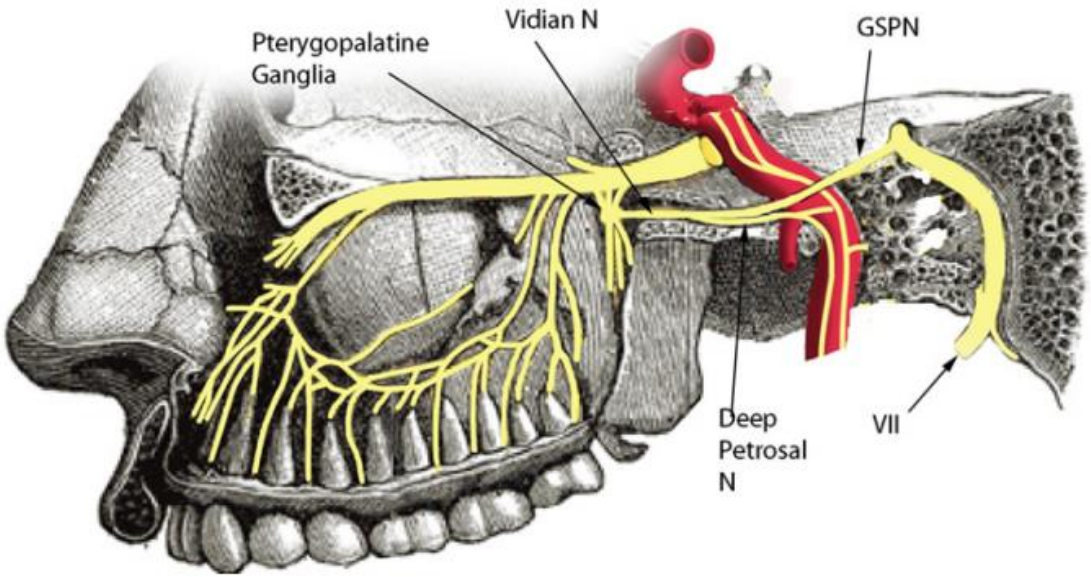
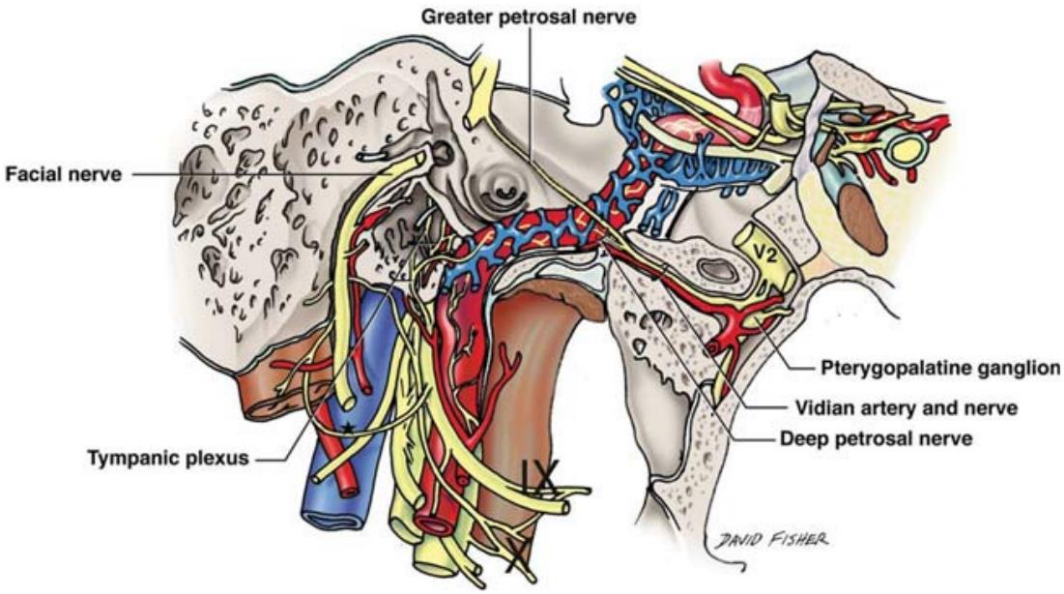
Napromienianie przebiegu nerwów czaszkowych u chorych na nowotwory głowy i szyi

KIEDY I JAK?

Joanna Socha







Moonis 2012, Shoja 2013

Recommended RT Doses

- GTV and CTV1—66-70Gy
- Intermediate Risk CTV2—60-63Gy
- Low Risk CTV3—54-56Gy
- Consider radiosensitizer (cisplatin or cetuximab) for clinical/radiographic PNS
  - Role of chemo is unclear in wake of TROG POST trial

Yom S, Stenmark M, Mukherji S, ASTRO 2017

Recommended Elective Neural Coverage

- Microscopic focal PNI
  - Consider larger margin 2cm at tumor bed CTV 'loża' = 60-63 Gy
- Microscopic extensive PNI CTV 'loża' = 60-63 Gy
  - Consider contouring to skull base CTV 'elekt.' = 54-56 Gy
- Clinical/radiographic PNS CTV (GTV+ 5mm) = 66-70Gy
  - Involved nerve—peripheral to skull base, cisternal/brainstem 60-63Gy
  - Communicating nerve pathways 60-63Gy w sąsiedztwie GTV
    54-56Gy elektywnie

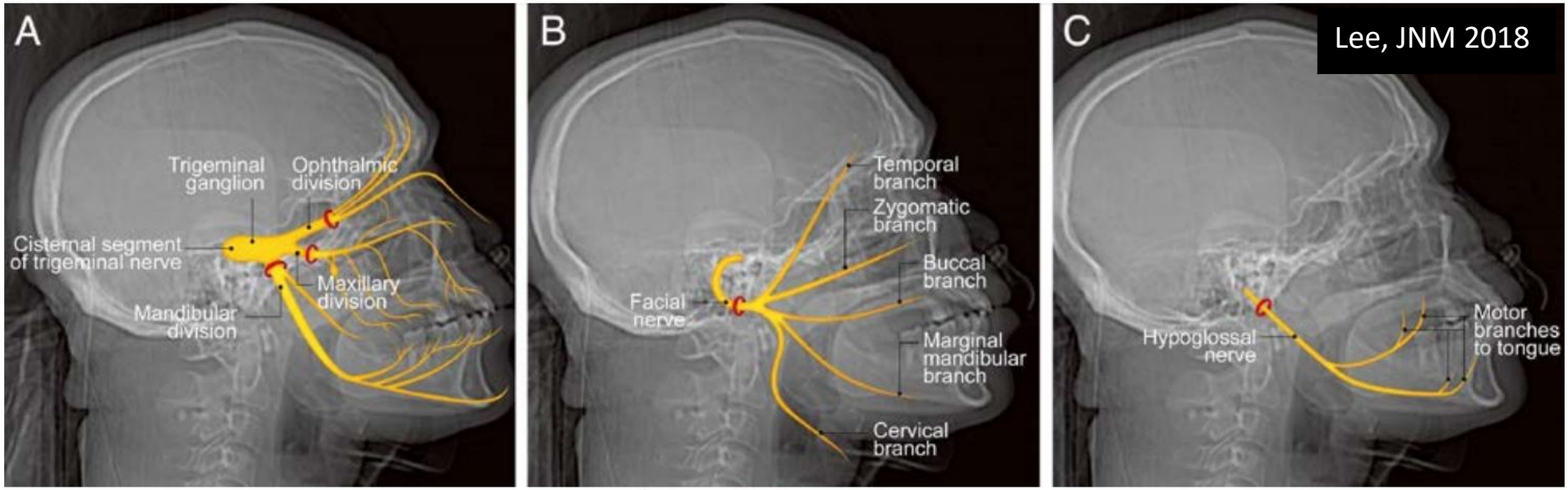
Yom S, Stenmark M, Mukherji S, ASTRO 2017

Target Volume Design

	Target Volume	Considerations & Recommendations
Dose Ranges	50-60 Gy	Microscopic PNI
	60-66 Gy	Positive margin along nerve
	66-70 Gy	Gross PNS appreciated in surgery or on imaging
Direction of Coverage	Anterograde coverage (Away from base of skull)	Cover if symptoms, pathology, or imaging suggest involvement
	Retrograde coverage (Towards base of skull)	Extensive microscopic PNI noted on pathology Clinical/radiographic PNS
Elective coverage of interconnections	Include interconnections	• When symptoms or imaging suggest involvement • High risk pathology e.g. adenoid cystic carcinoma or cutaneous SCC

Yom S, Stenmark M, Mukherji S, ASTRO 2017

Najczęściej zajęte nerwy czaszkowe



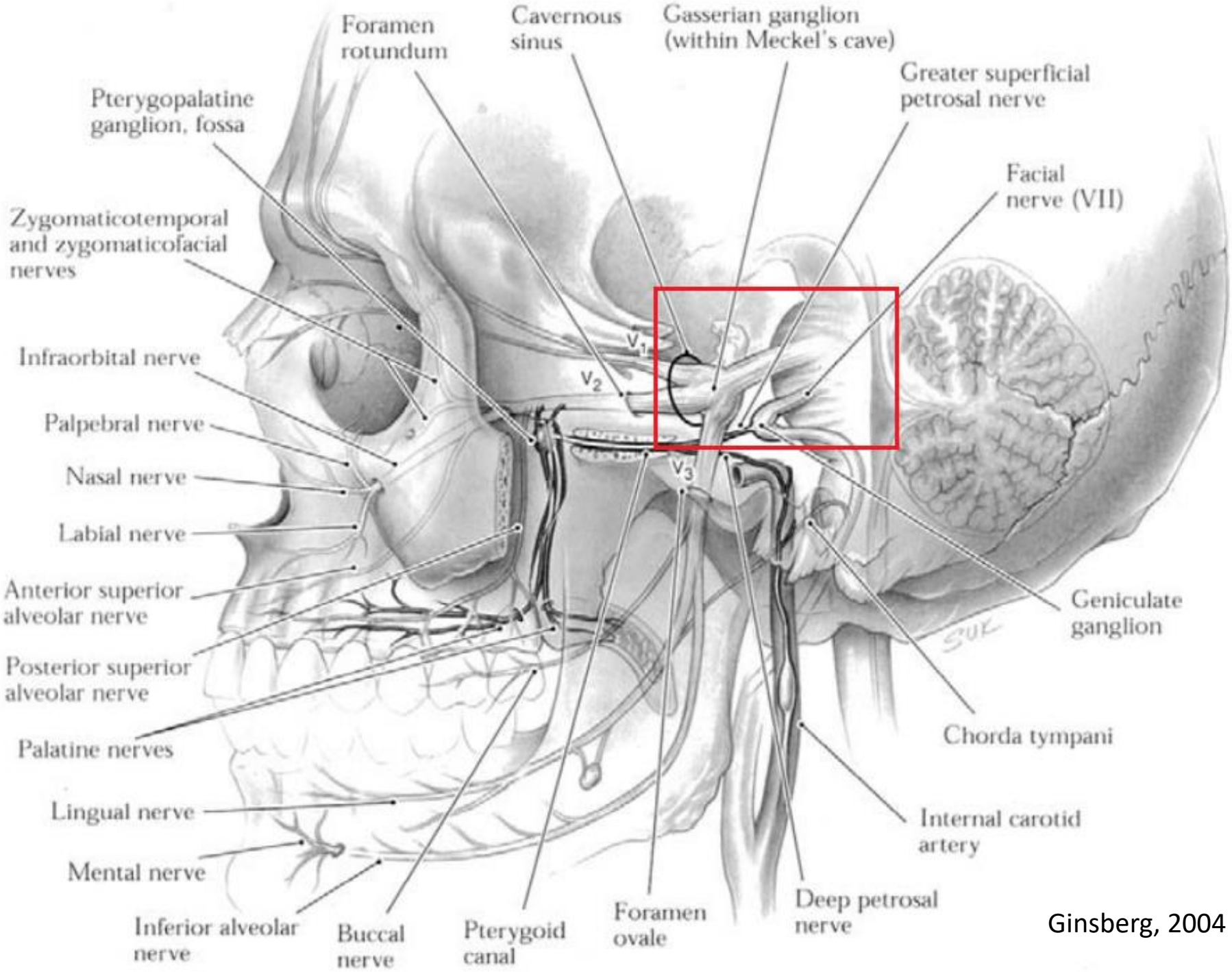
Nerw trójdzielny V | **Nerw twarzowy VII** | **Nerw podjęzykowy XII**

+ ZESPOLENIA MIĘDZY NIMI…

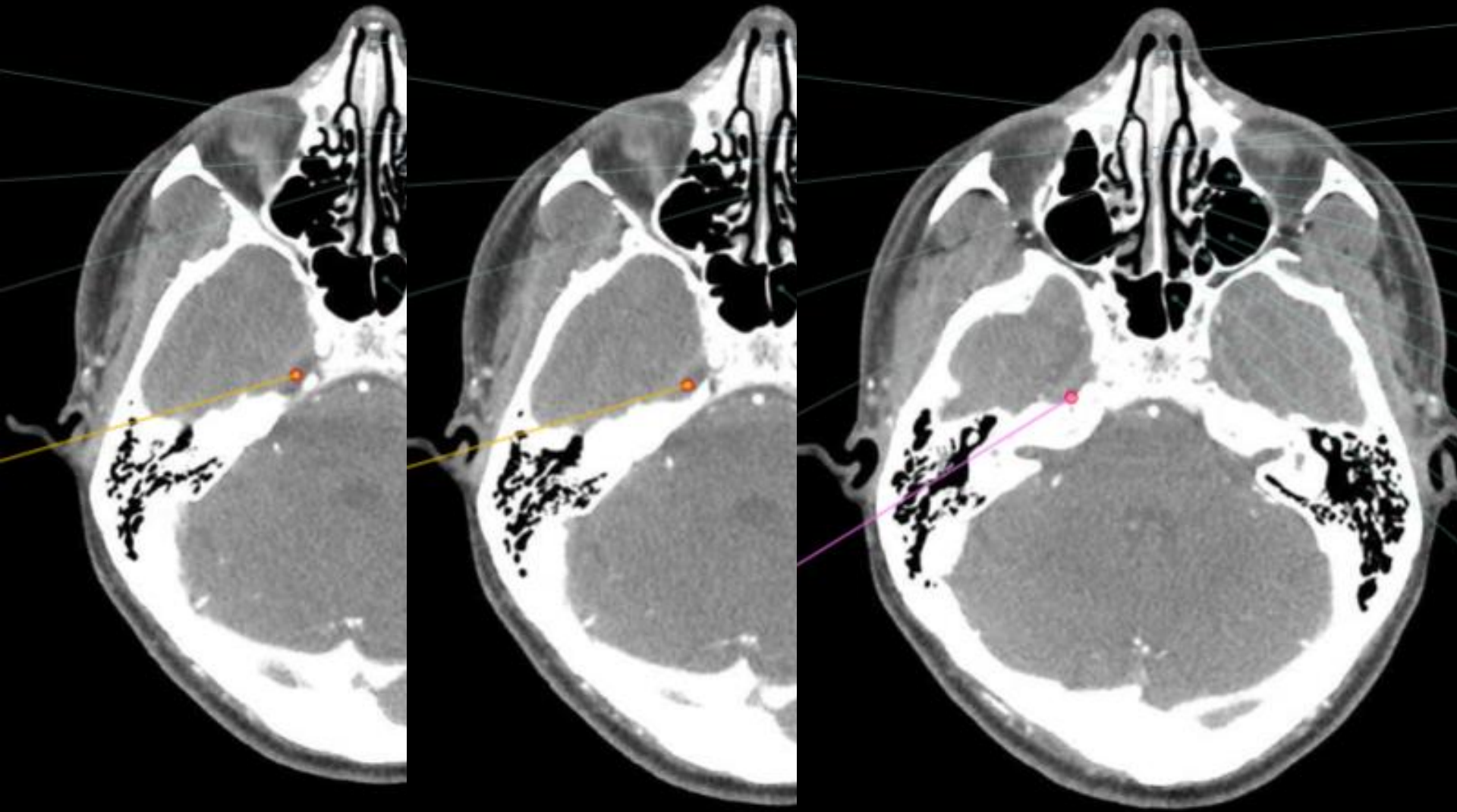
Przykładowe sytuacje kliniczne

- rak ślinianki
  - przyusznej: **VII, V3**, *ATN – nerw uszno-skroniowy*
  - podżuchwowej: **V3, XII**, *VII: chorda tympani*
  - podjęzykowej: **V3,** *VII: chorda tympani*
- rak dna j.u., języka: **V3,** (XII – lokalizacja, zaawans.), *VII: chorda tympani*
- rak nasady języka: **XII**
- rak podniebienia twardego:
  - **V2**, *VII: PPF, GSPN – n. skalisty większy, n. Widiusza*
- rak skóry
  - wargi dolnej: **V3** (n. bródkowy → n. zębodołowy dolny)

/Lee 2015, Ko 2014, Stambuk 2013, Gluck 2009, Maroldi 2008/



Ginsberg, 2004

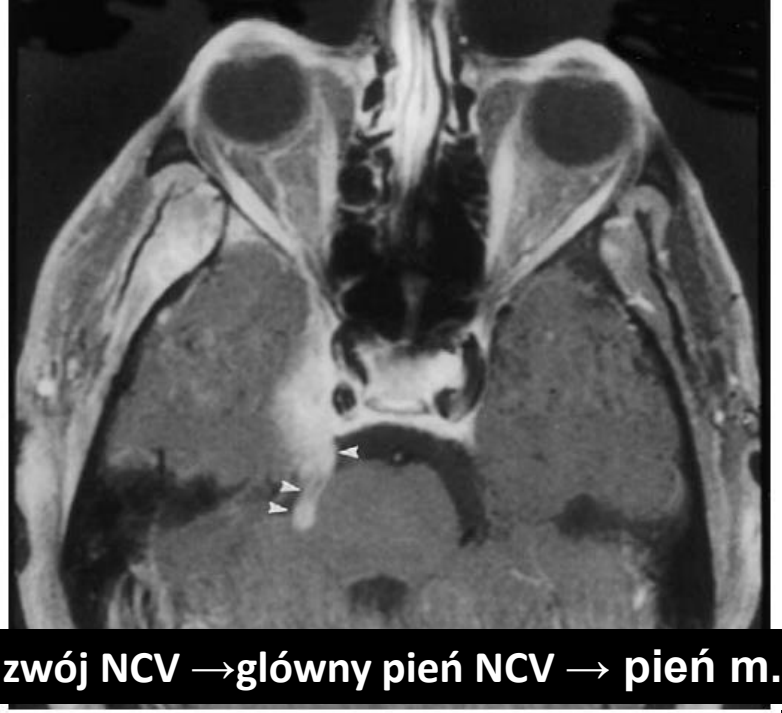


www.imaios.com

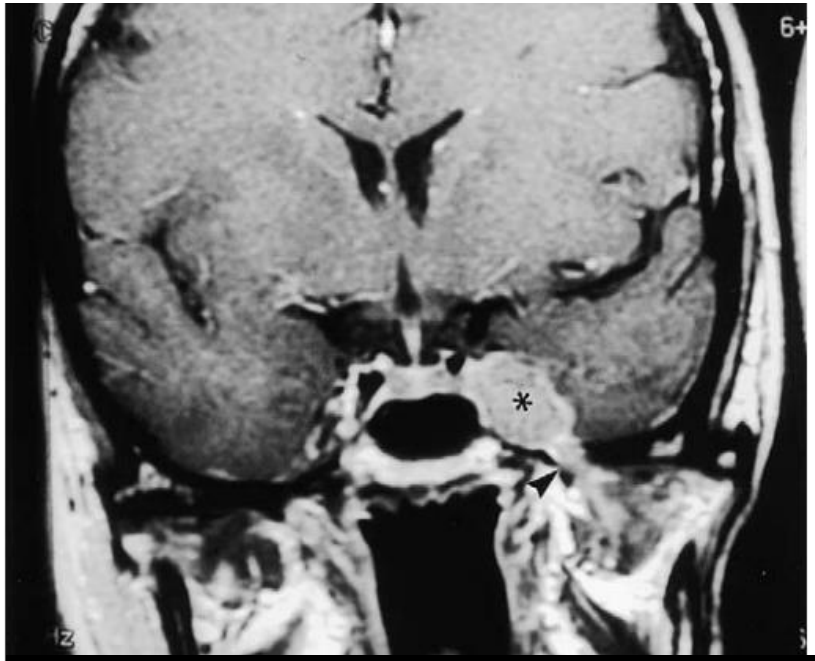
WYCISK N. TRÓJDZIELNEGO (JAMA MECKELA)

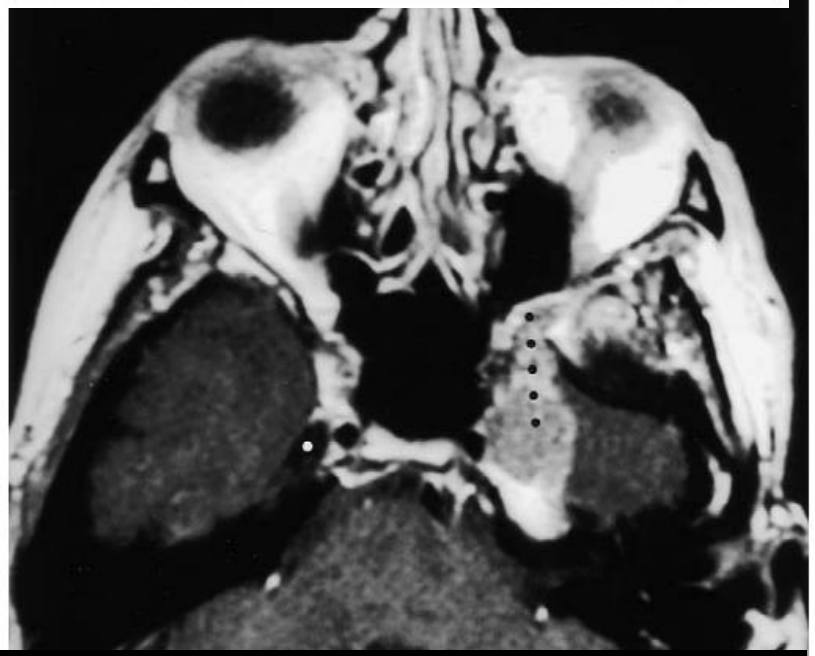


V2 → FR → zwój NCV



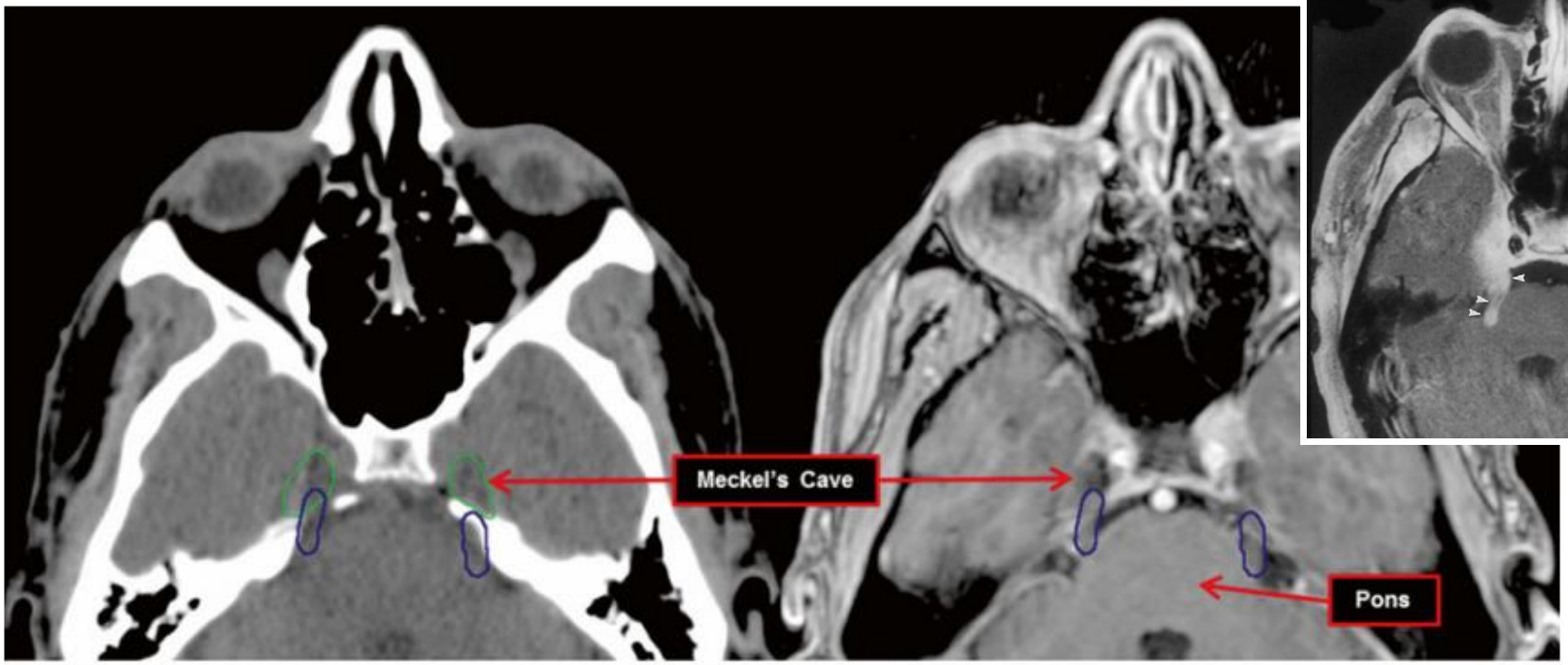
zwój NCV →główny pień NCV → pień m.

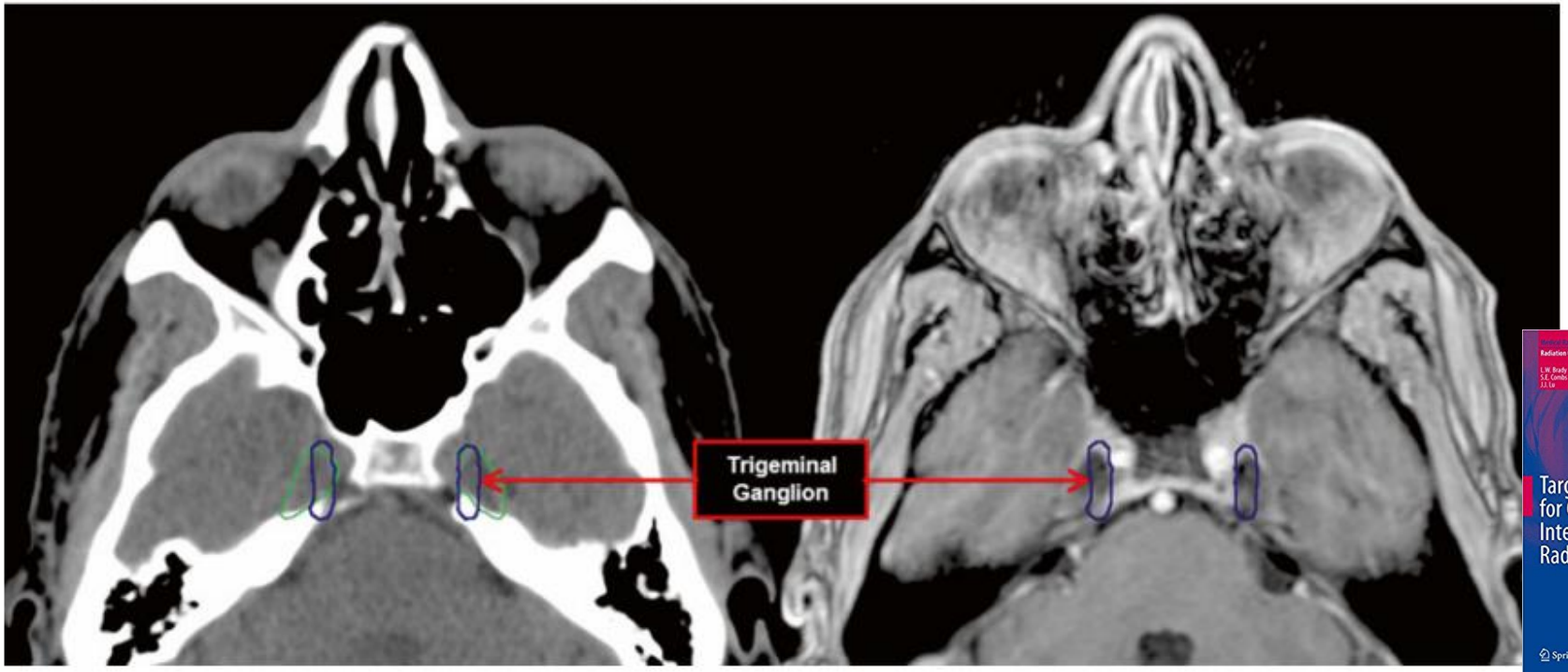


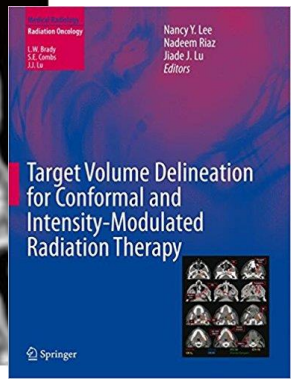


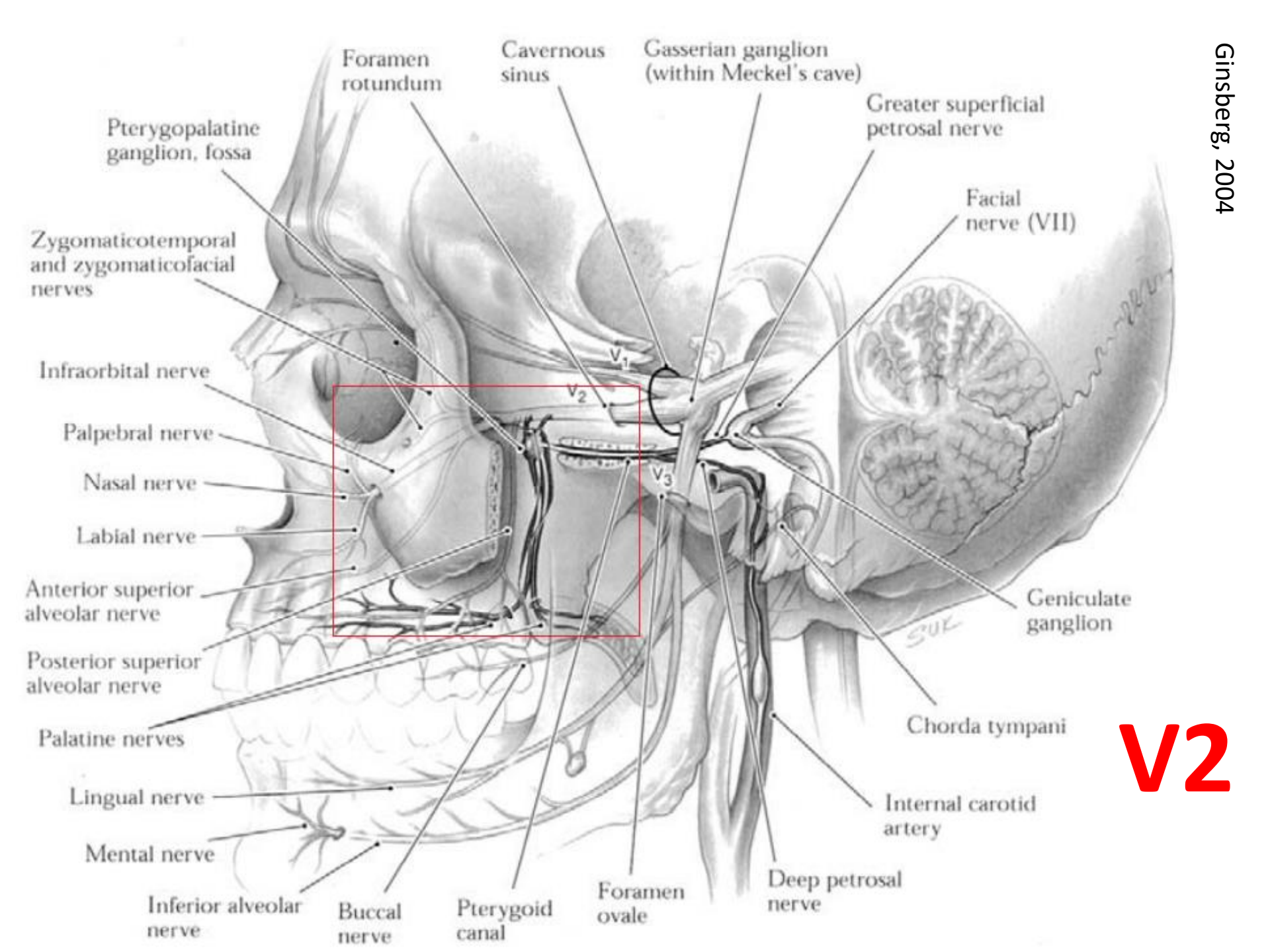
PAROTID → ATN → V3 → FO → zwój NCV* → V2 → FR →PPF

Ginsberg, 2004


Meckel's Cave
Pons

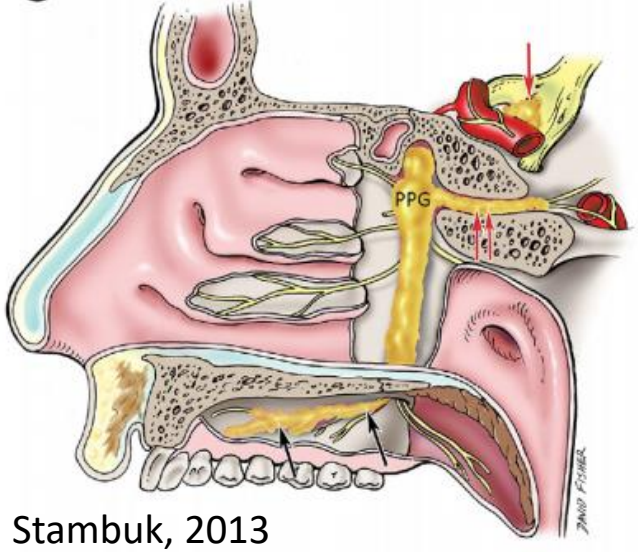

Trigeminal Ganglion


Radiation Oncology
L.W. Brady
S.E. Combs
J.J. Lo
Nancy Y. Lee
Nadeem Riaz
Jiade J. Lu
Editors
Target Volume Delineation for Conformal and Intensity-Modulated Radiation Therapy
Springer

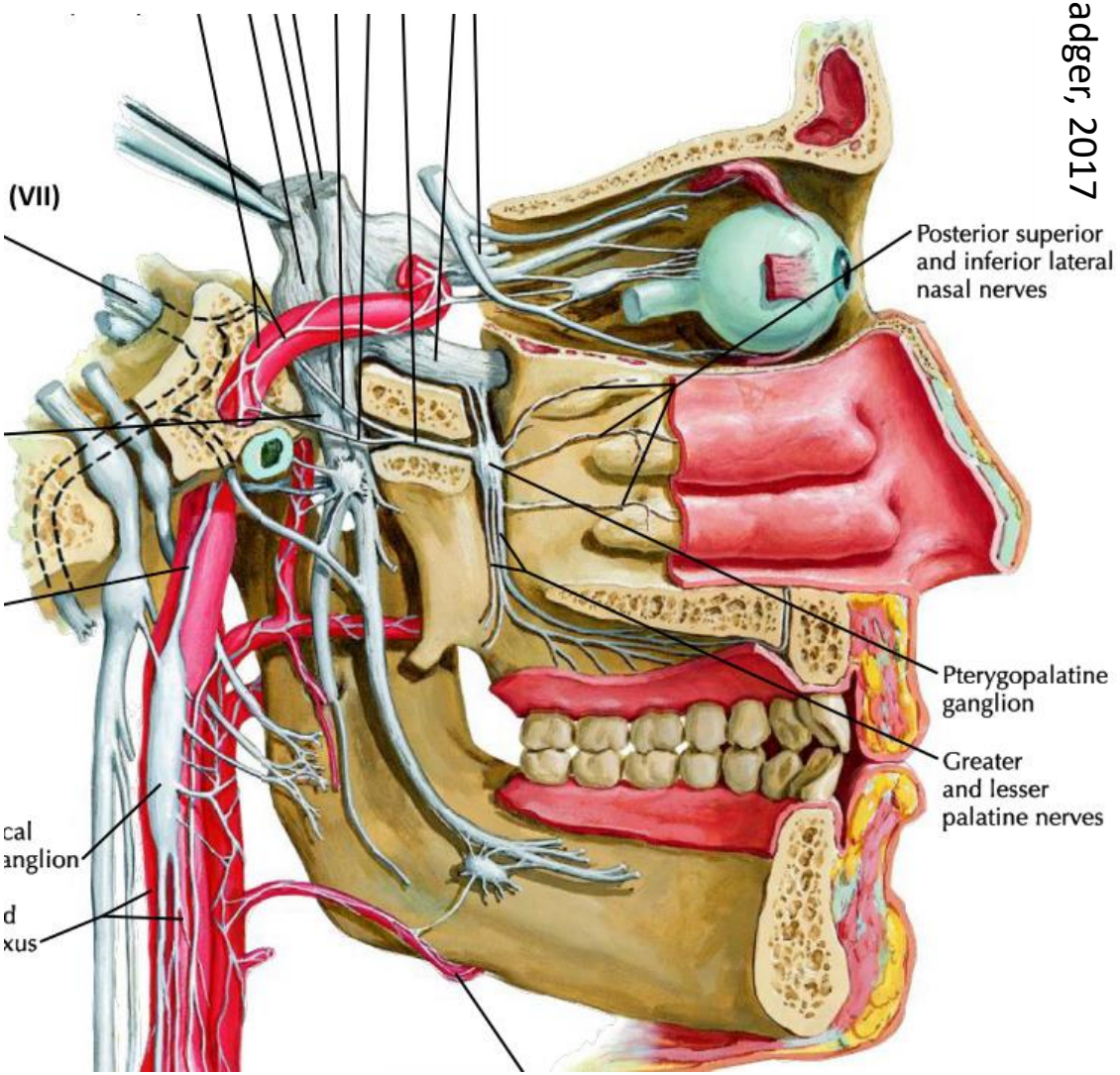


Ginsberg, 2004

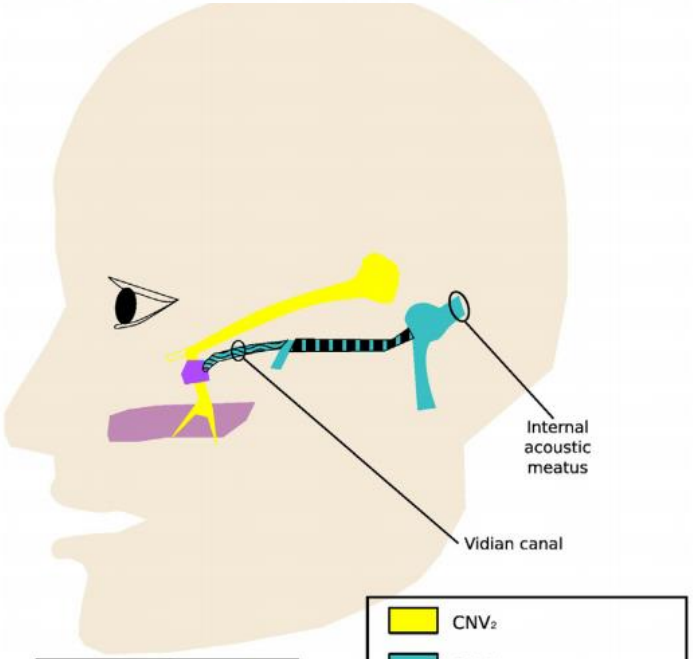
V2

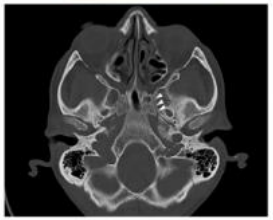


Stambuk, 2013

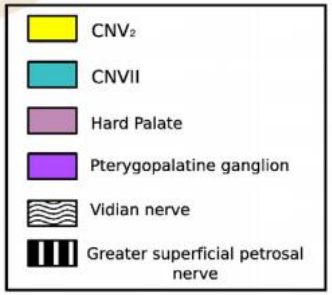


Badger, 2017



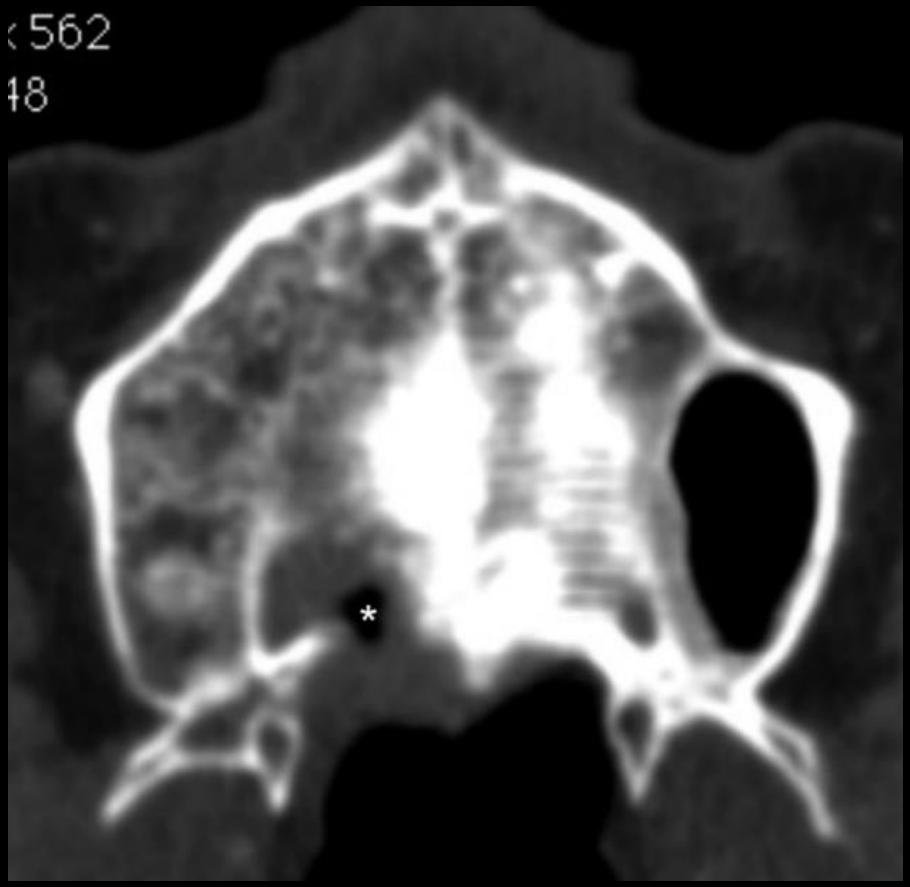


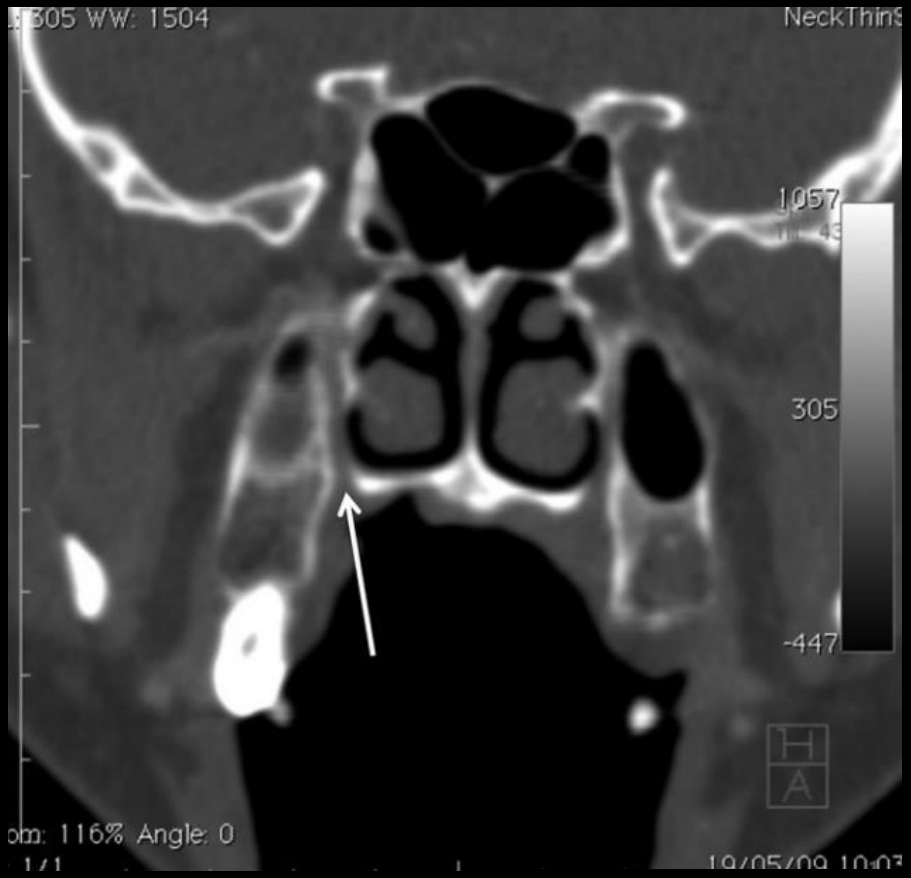
Ko, 2014



Nerwy podniebienne → PPF → V2

RAK PODNIEBIENIA MIĘKKIEGO - PNI





Mazziotti, CARJ 2015

ACC podniebienia miękkiego z naciekaniem okołonerwowym:
- powiększenie prawego otworu podniebiennego większego (strzałka - A)
- poszerzenie kanału skrzydłowo-podniebiennego (strzałka - B),

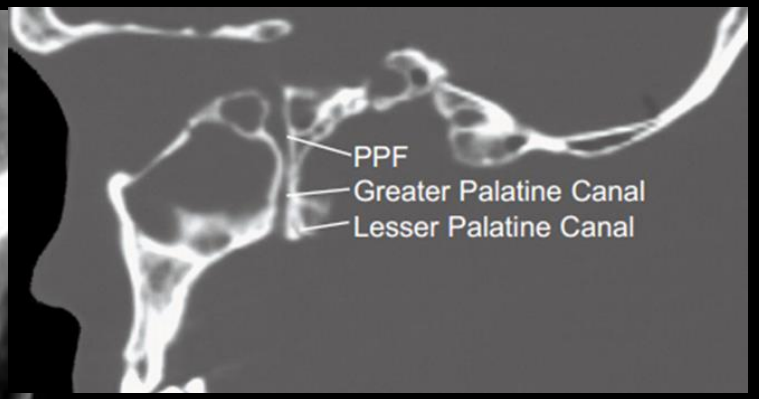
jako oznaki **szerzenia się nacieku drogą nerwów podniebiennych**

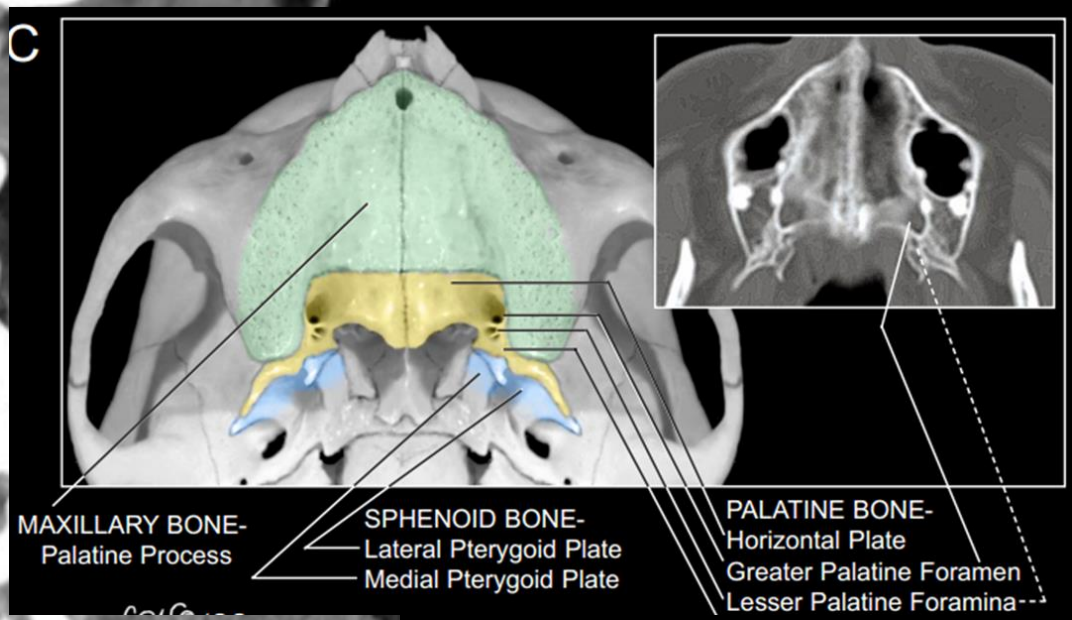
RAK PODNIEBIENIA MIĘKKIEGO - PNI

szerzenie się nacieku na podstawę czaszki drogą nerwów podniebiennych

Kanał podniebienny większy = skrzydłowo-podniebienny



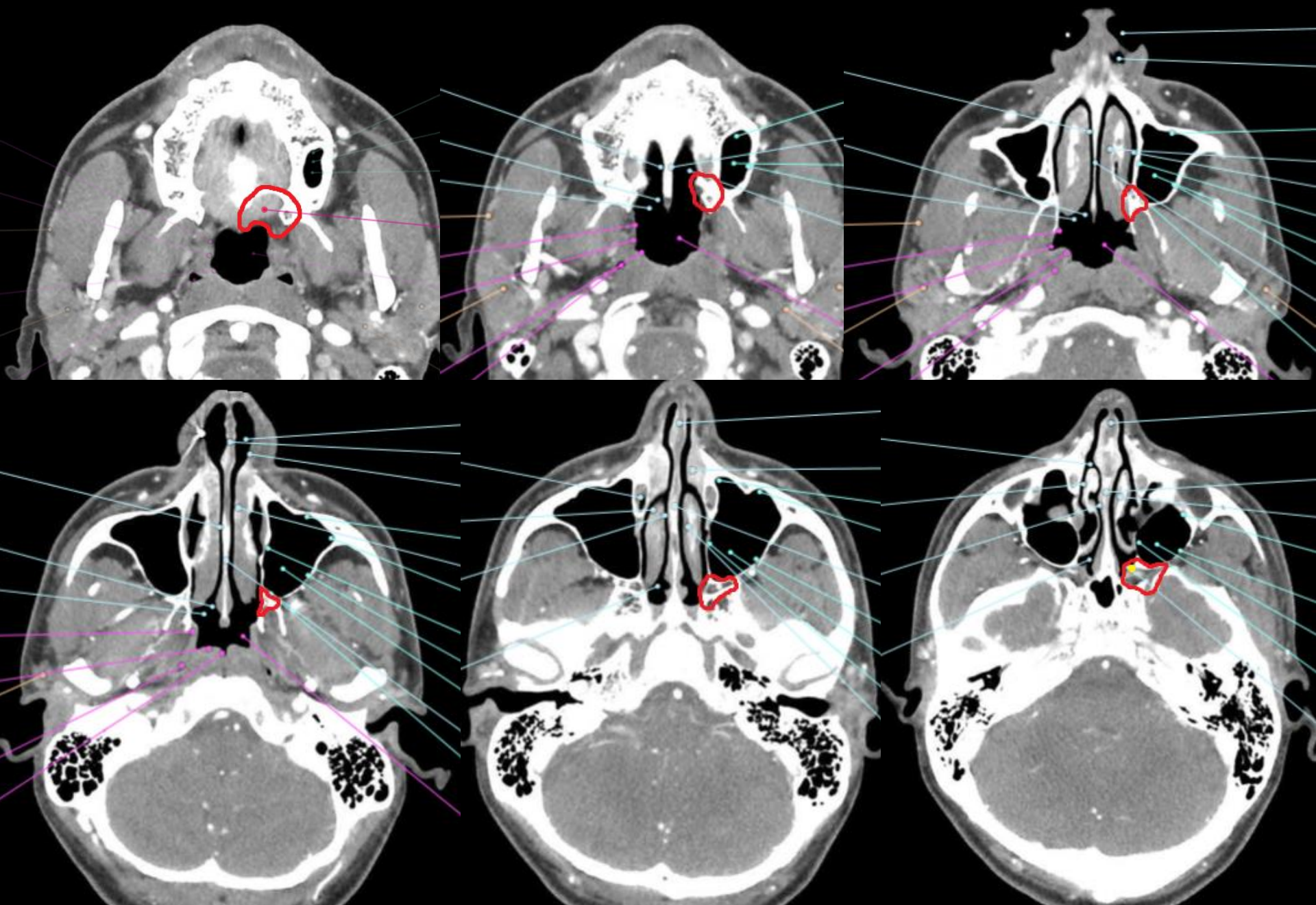




www.imaios.com

Daniels, AJNR 1998

PNI: nn. podniebienne → zwój S-P





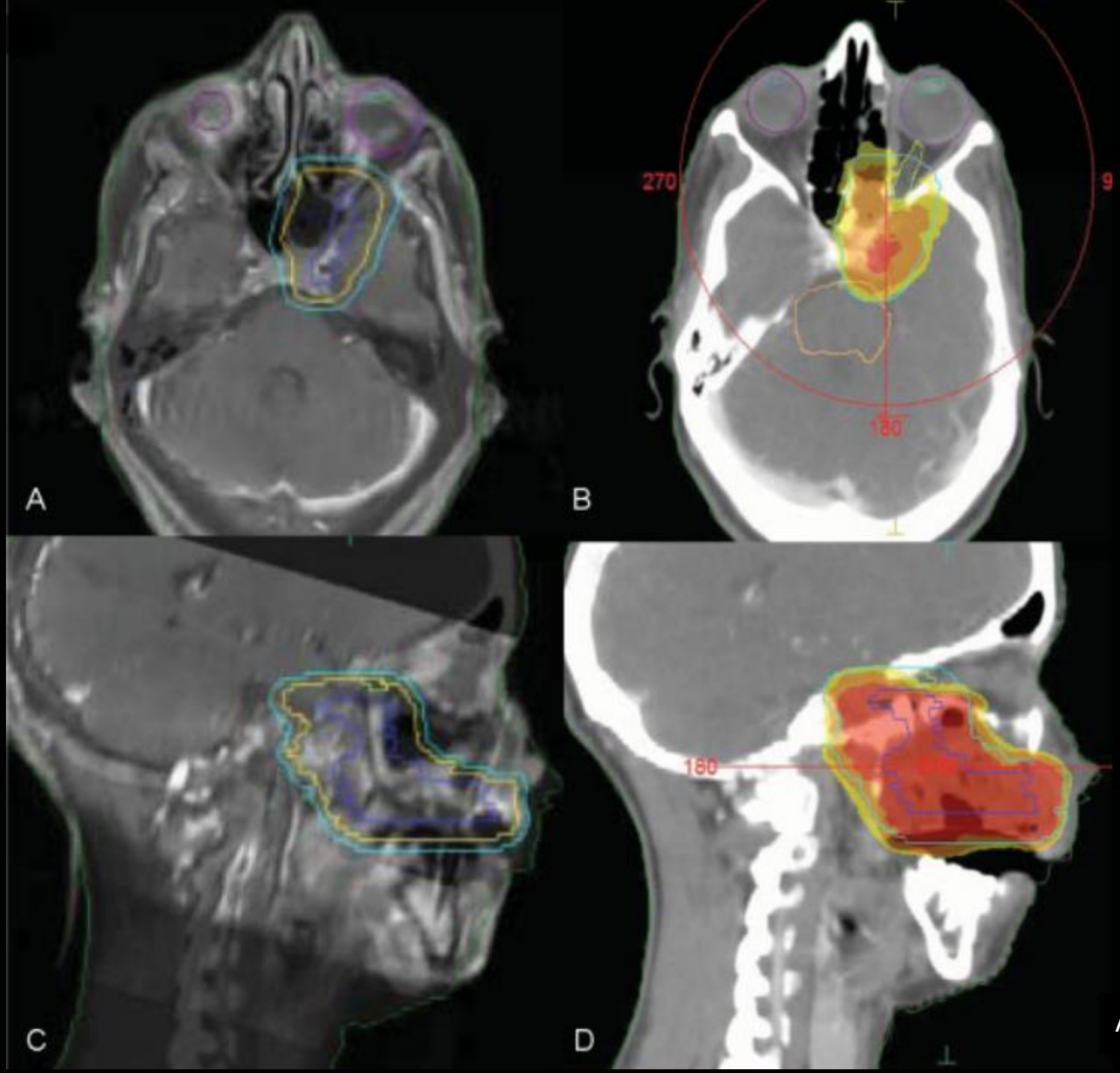




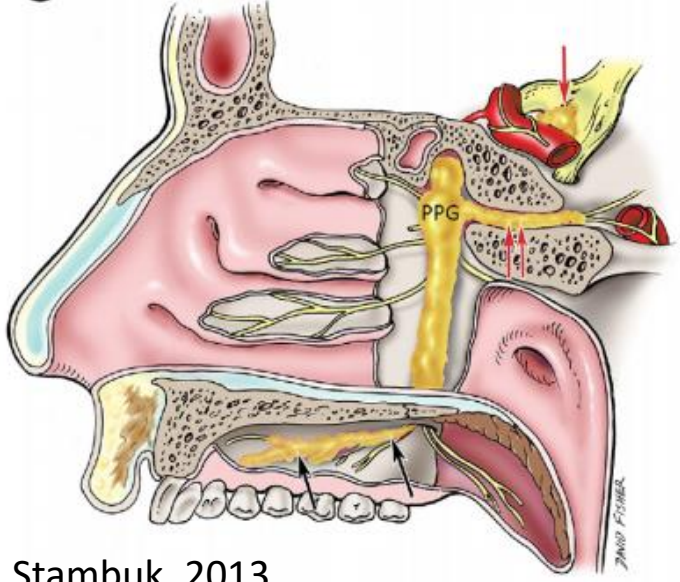




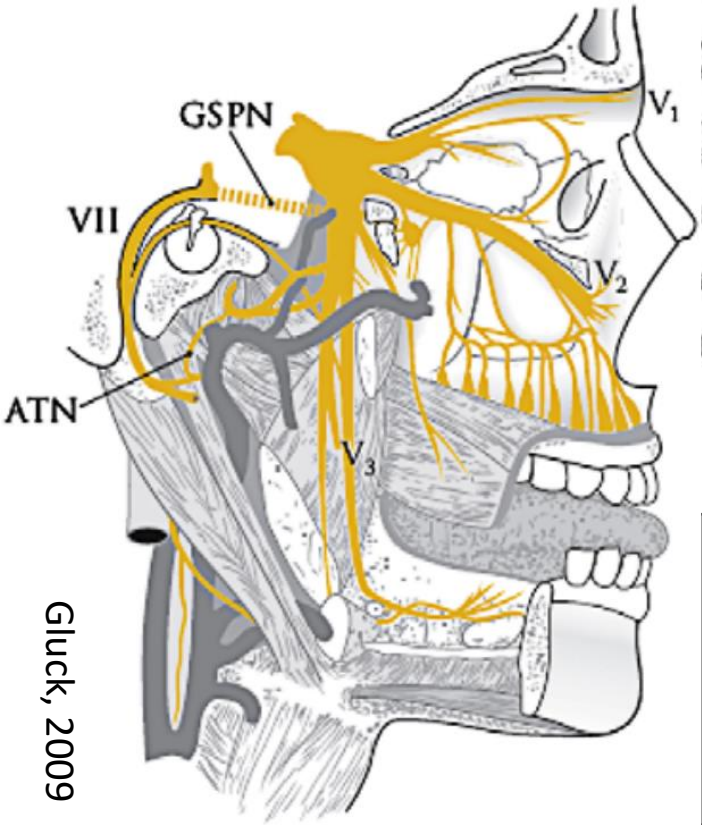
PNI: zwój S-P → V2 → zwój NCV



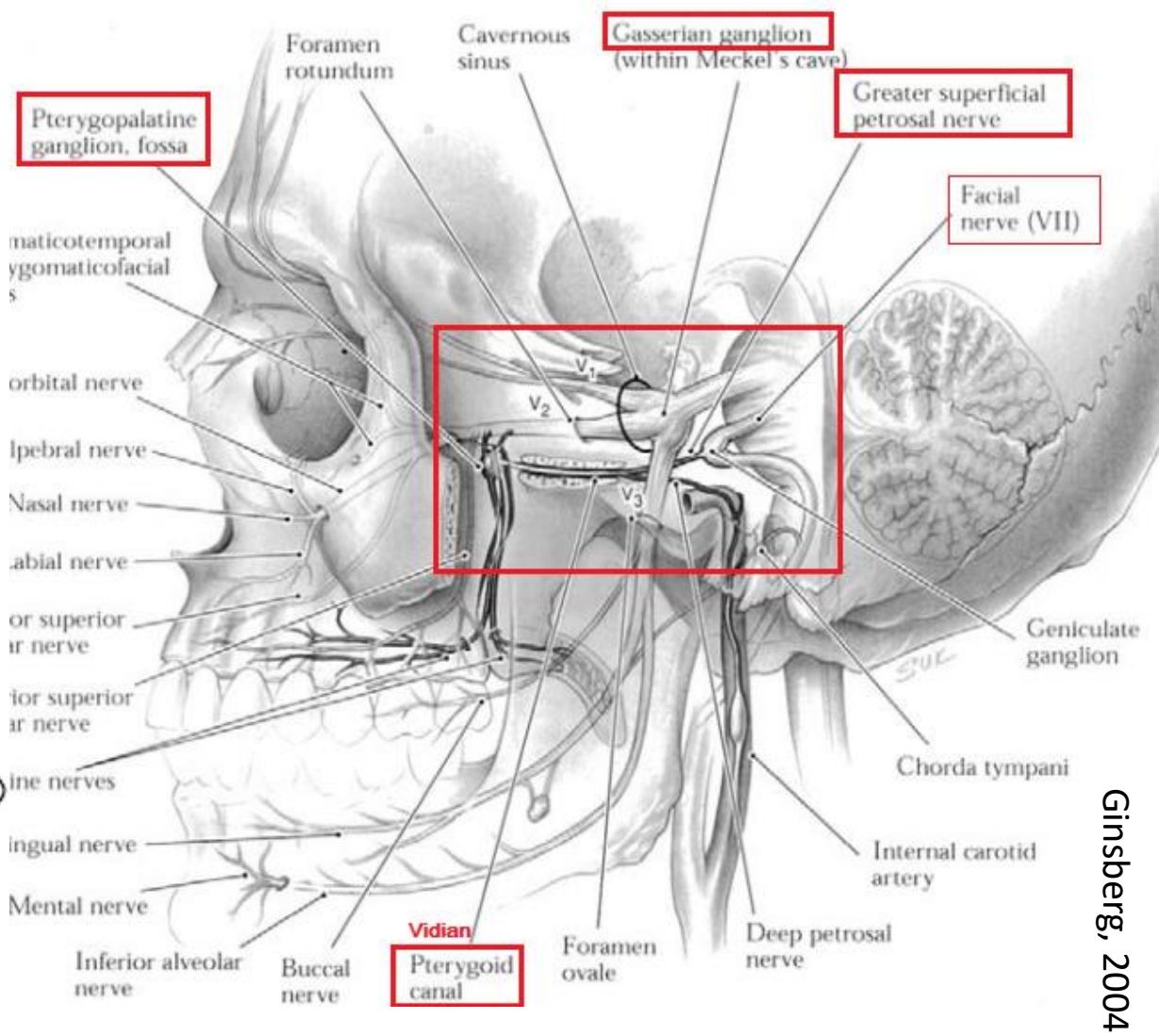
Amit, 2016



Stambuk, 2013



Gluck, 2009



Ginsberg, 2004

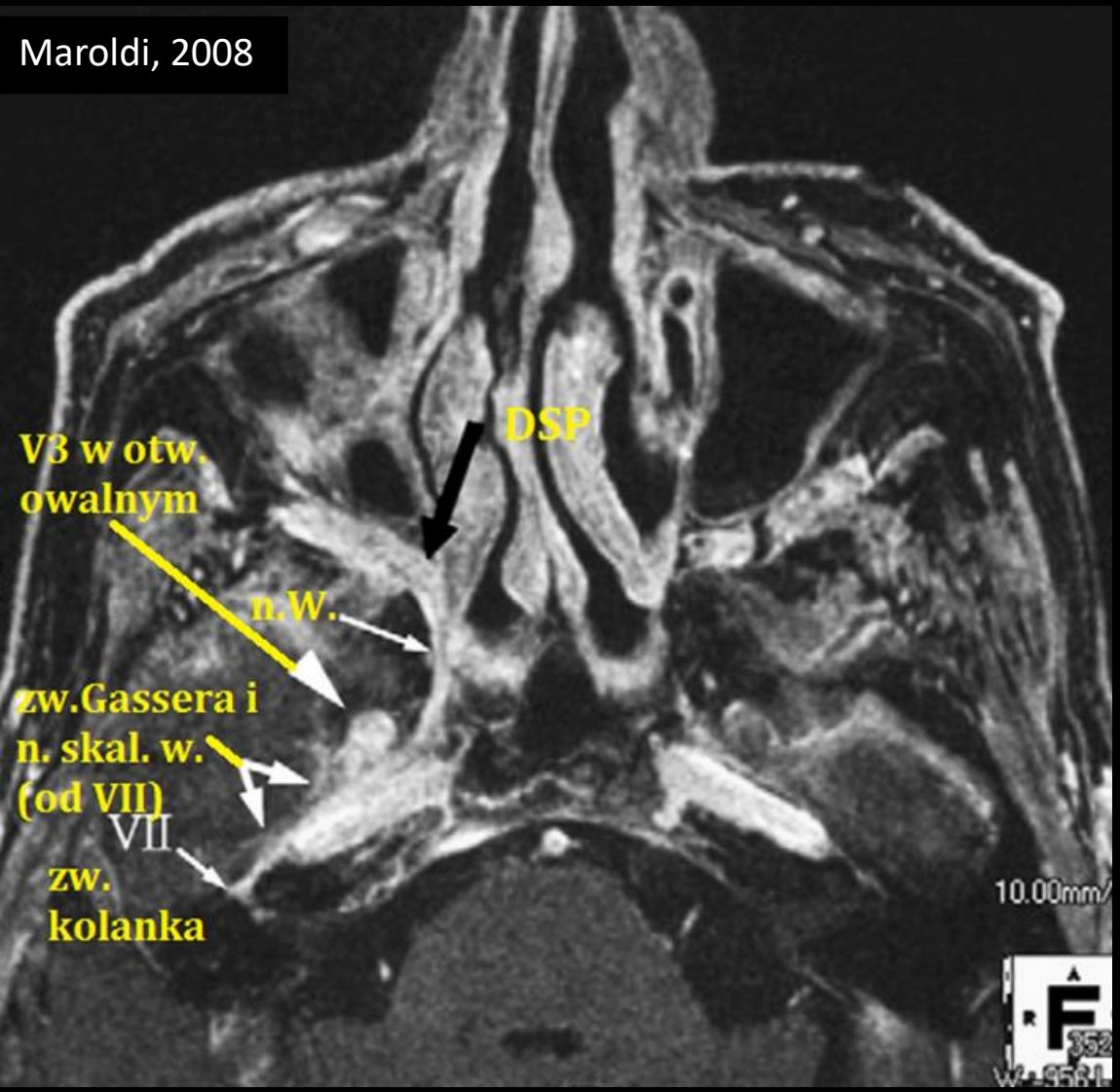
GSPN – nerw skalisty większy

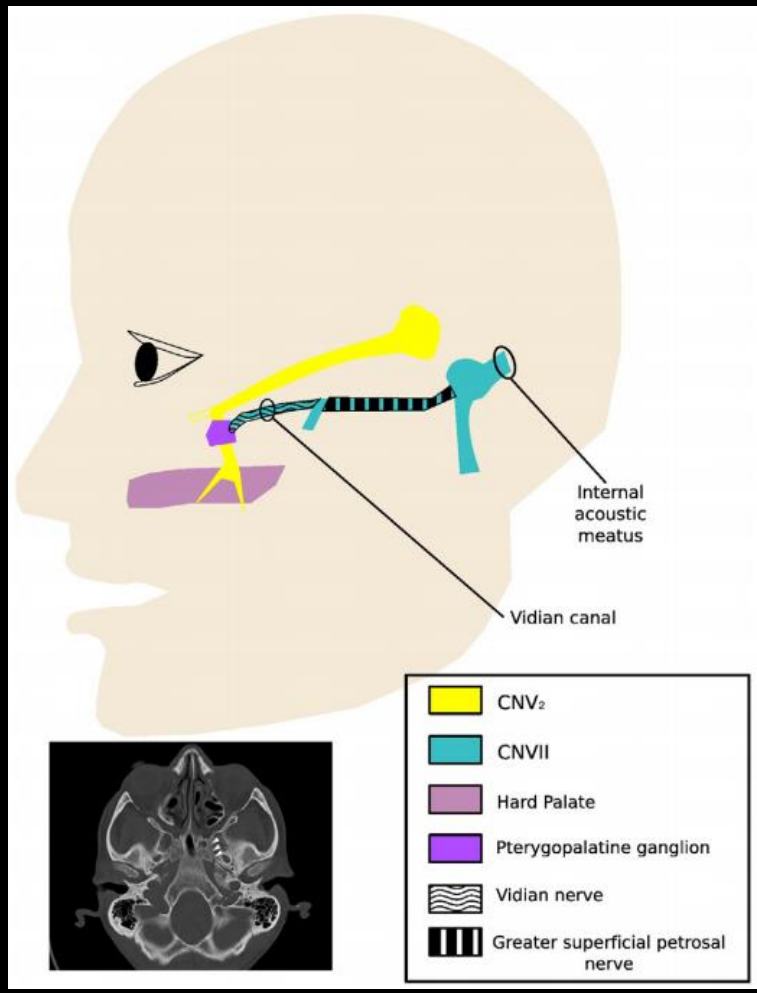
VII – V2 przez PPF i n. Widiusza;

V2, V3 bezpośrednio (w przypadku makroskopowego nacieku) – biegnie tuż pod jamą Meckela

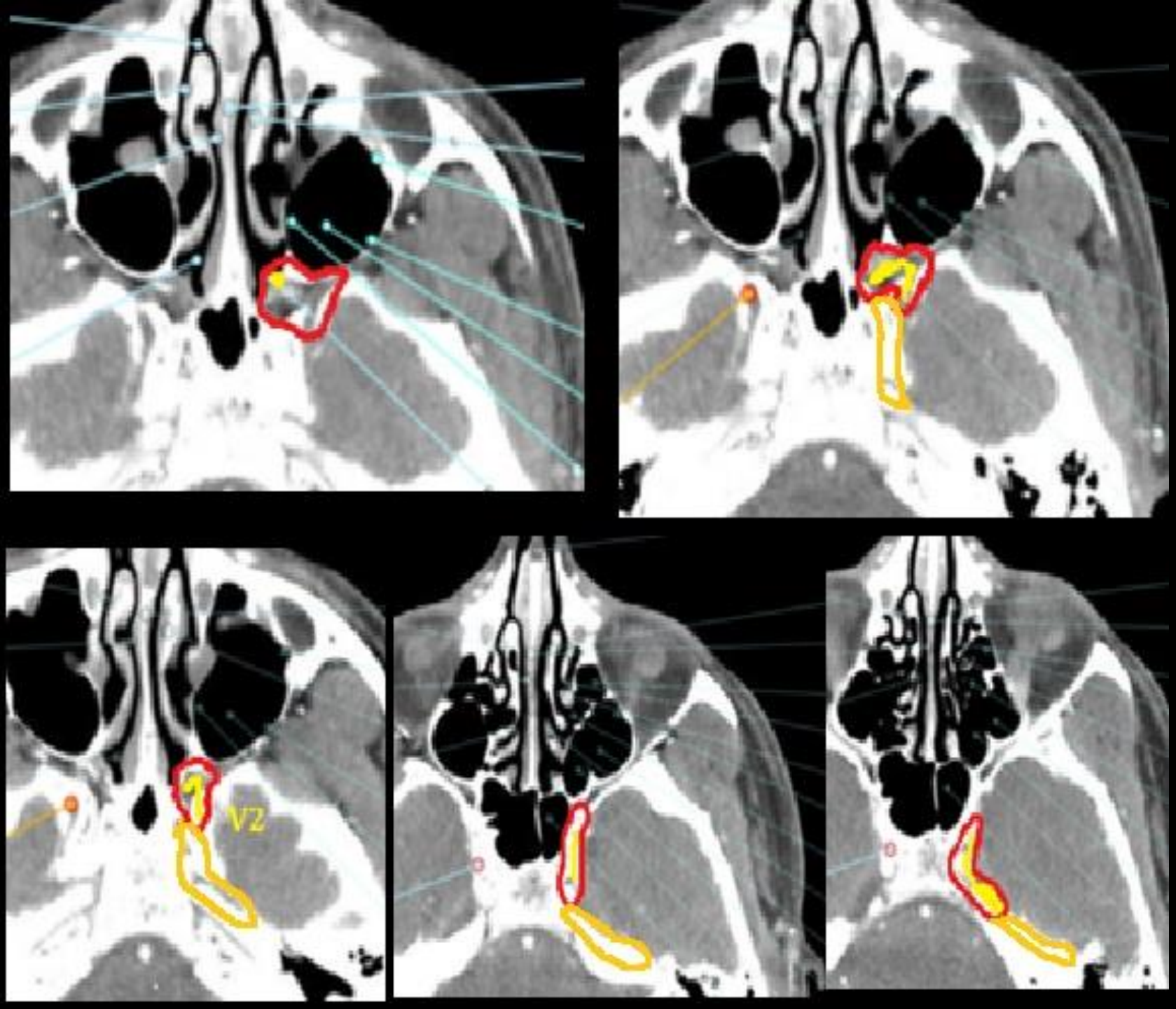
V2 → VII

Maroldi, 2008

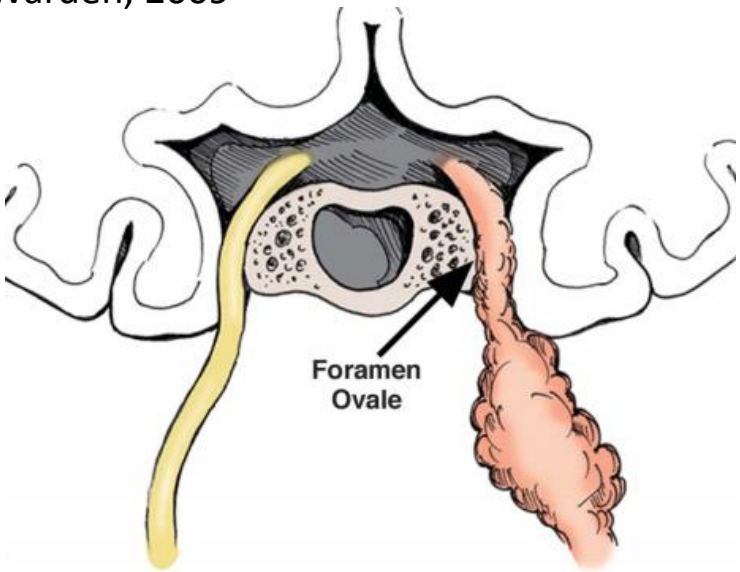




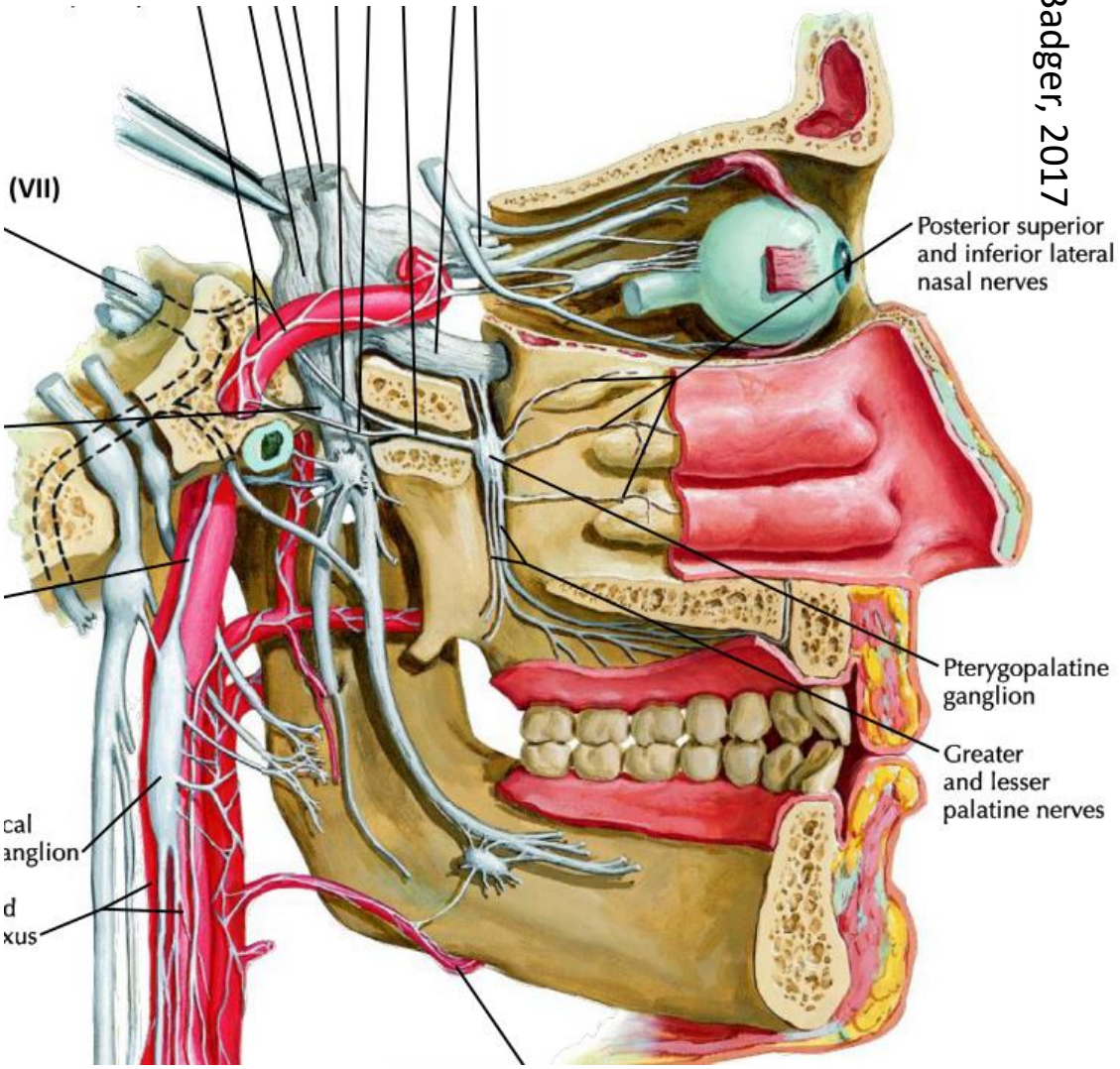
Ko, 2014

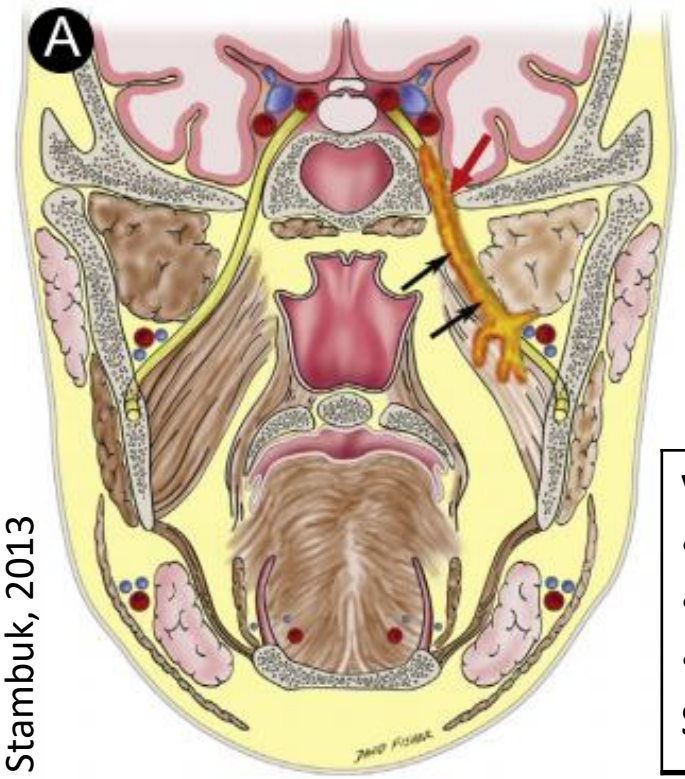

V2

Warden, 2009



Badger, 2017





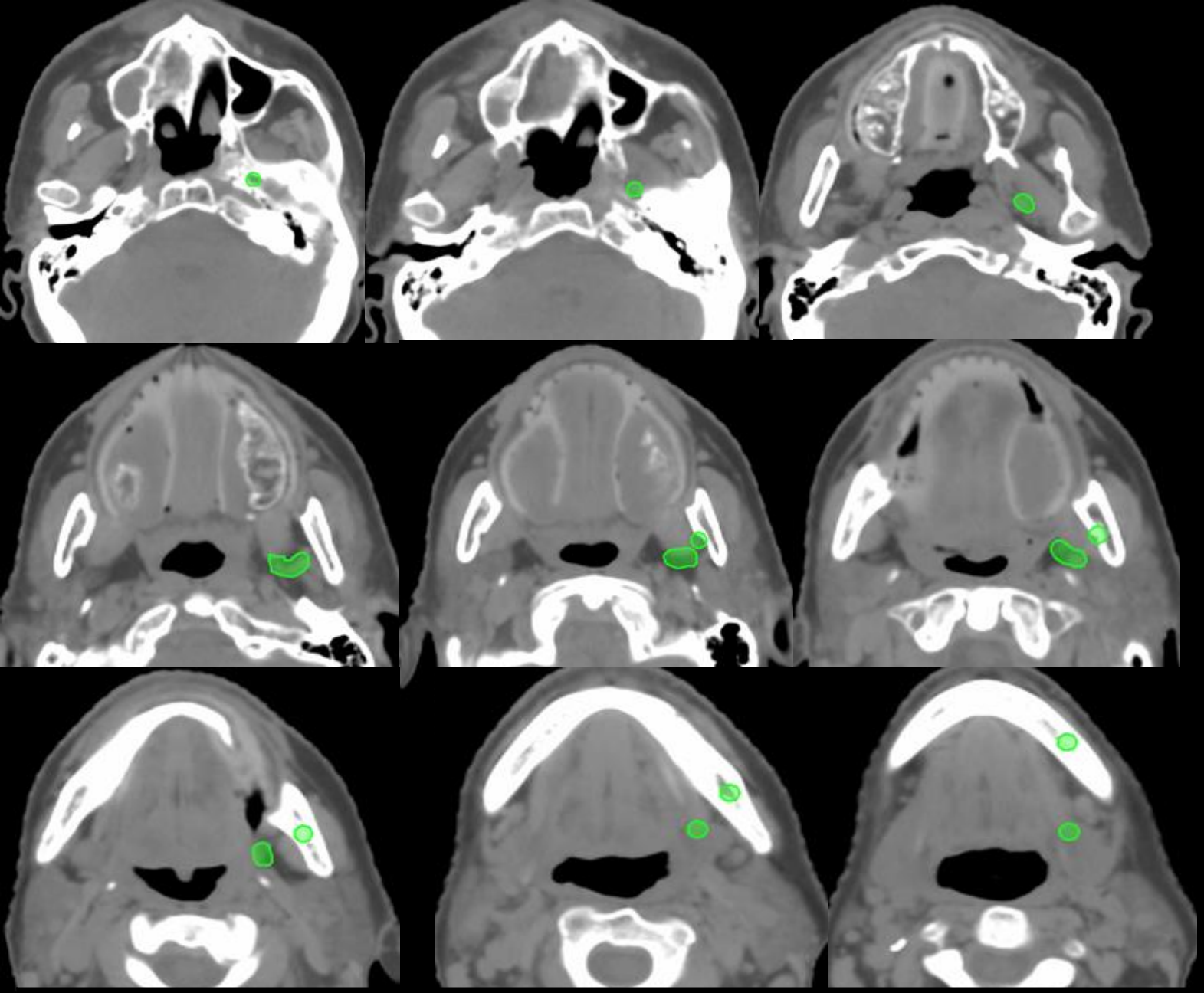
Stambuk, 2013

V3:

- **NERW JĘZYKOWY**
- **NERW ZĘBODOŁOWY DOLNY (IAN)**
- **NERW USZNO-SKRONIOWY (ATN) – VII**

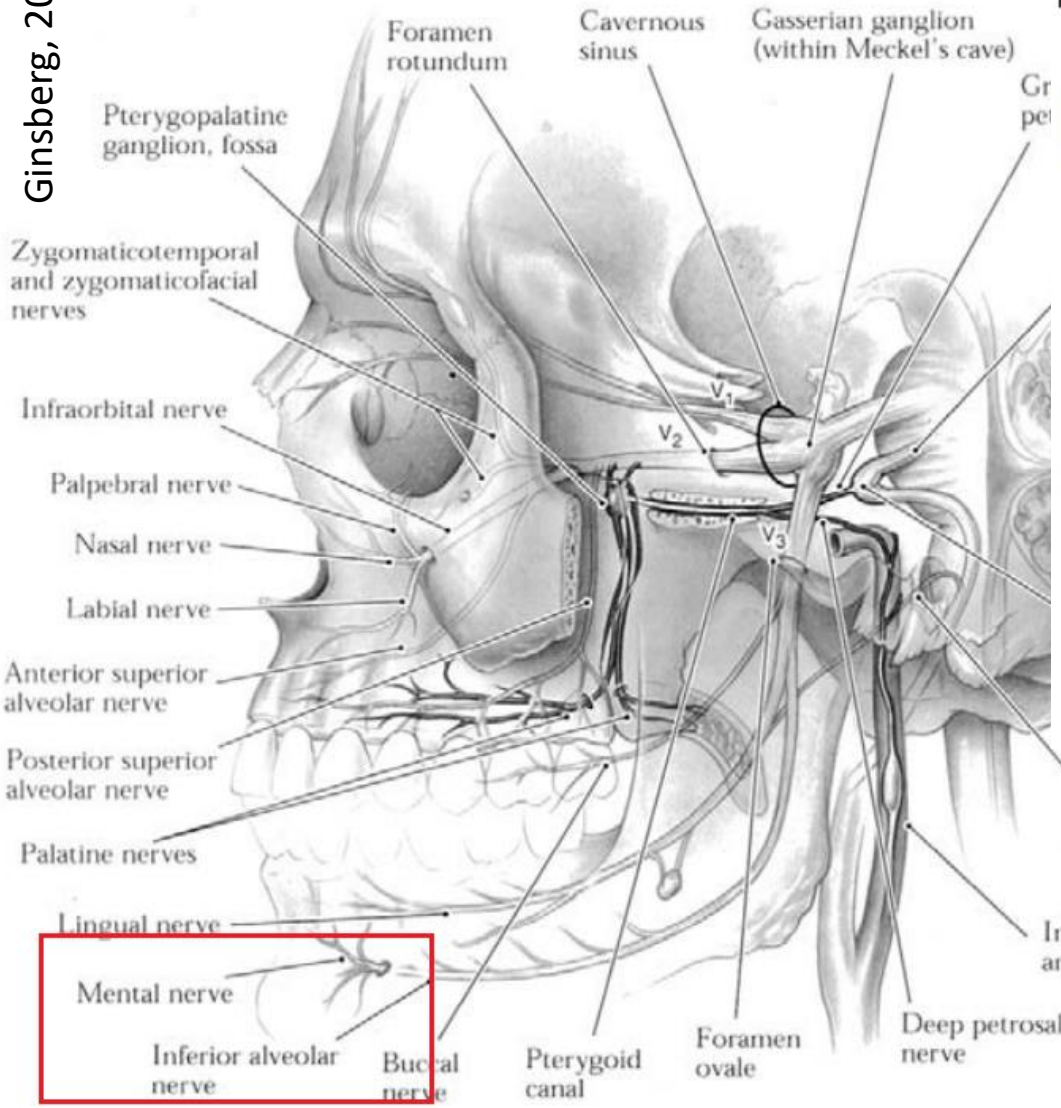
Struna bębenkowa (CHT-chorda tympani) – VII

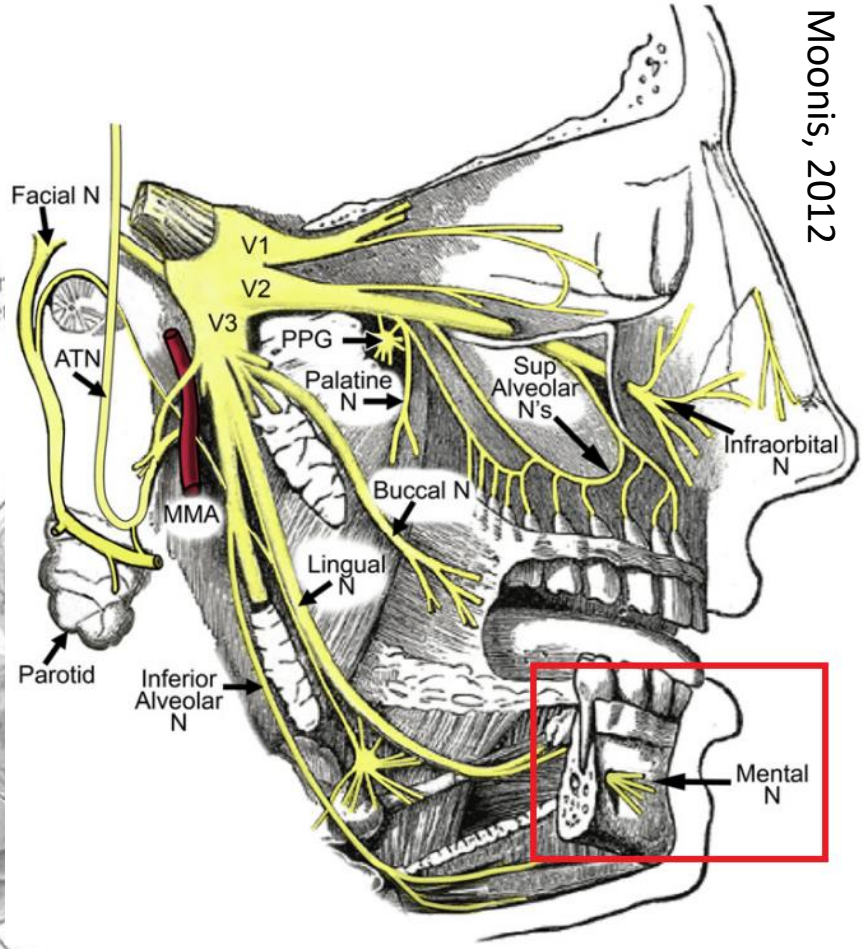
V3



Przebieg V3 (od podstawy czaszki) - FO

Ginsberg, 2004





Moonis, 2012

V3

N. BRÓDKOWY → N. ZĘBODOŁOWY DOLNY

RAK SKÓRY WARGI DOLNEJ

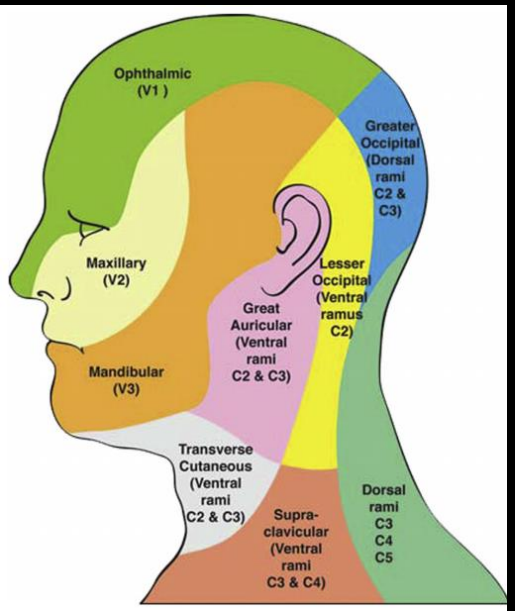
Lower lip

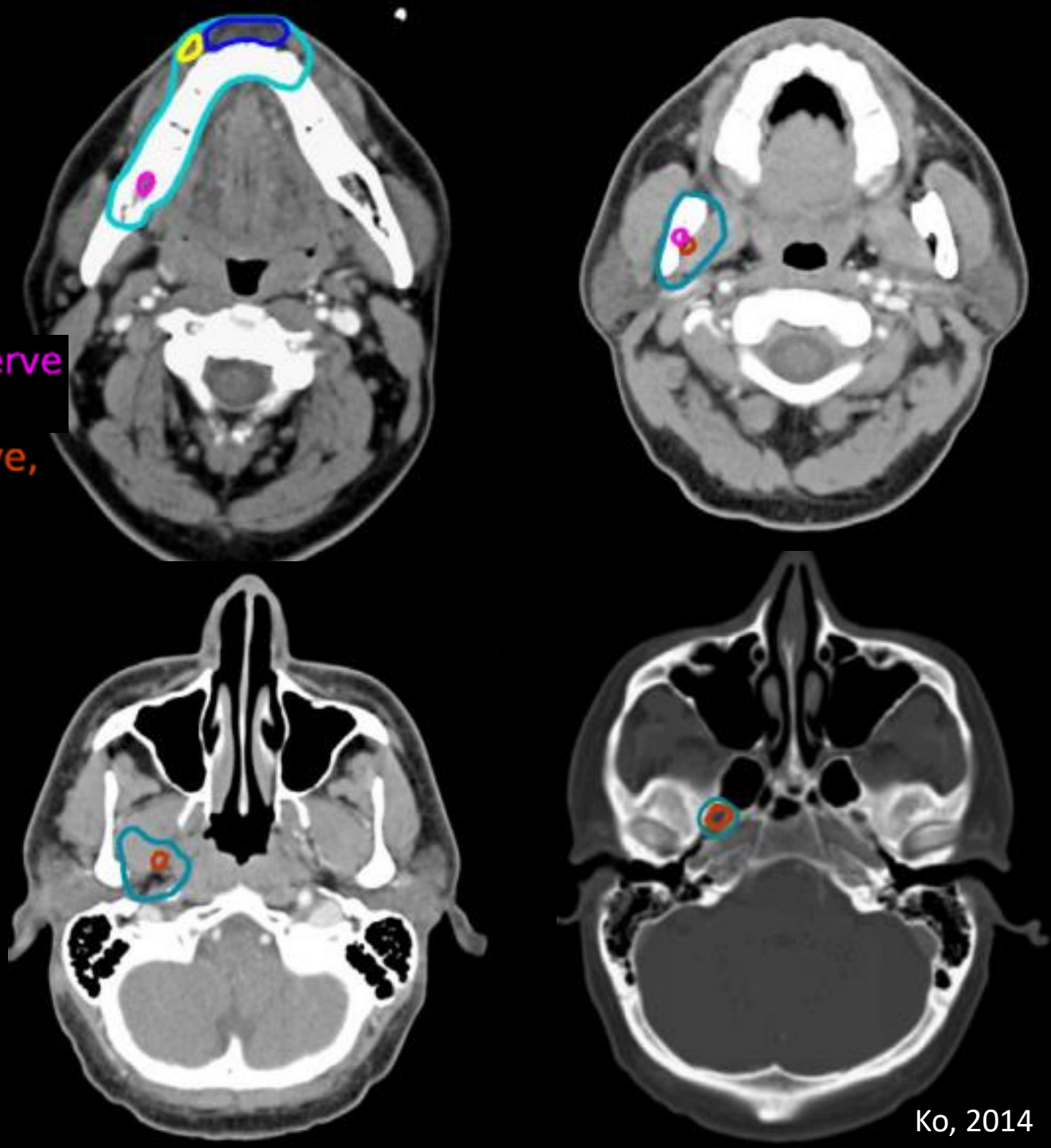
Mental nerve (CNV3)

Inferior alveolar nerve (CNV3)

Mandibular nerve, CNV3

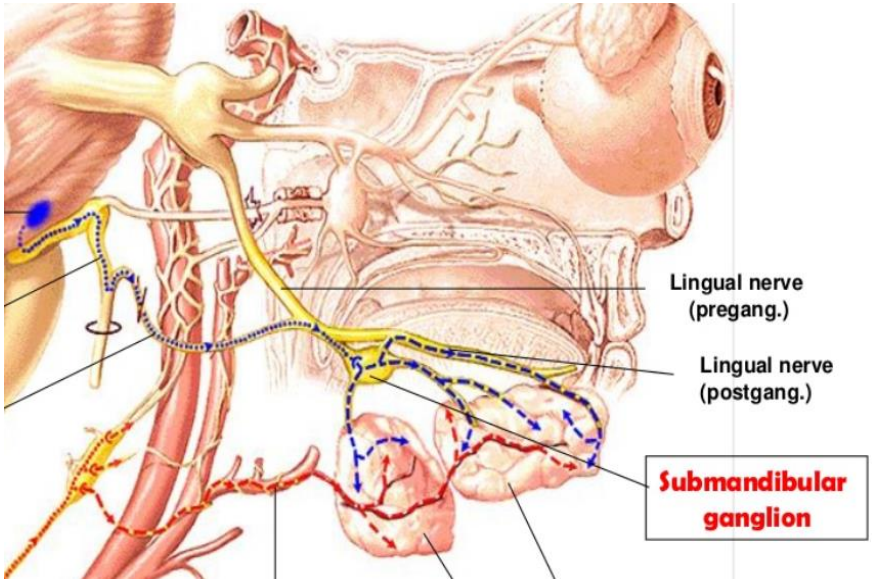
CTV

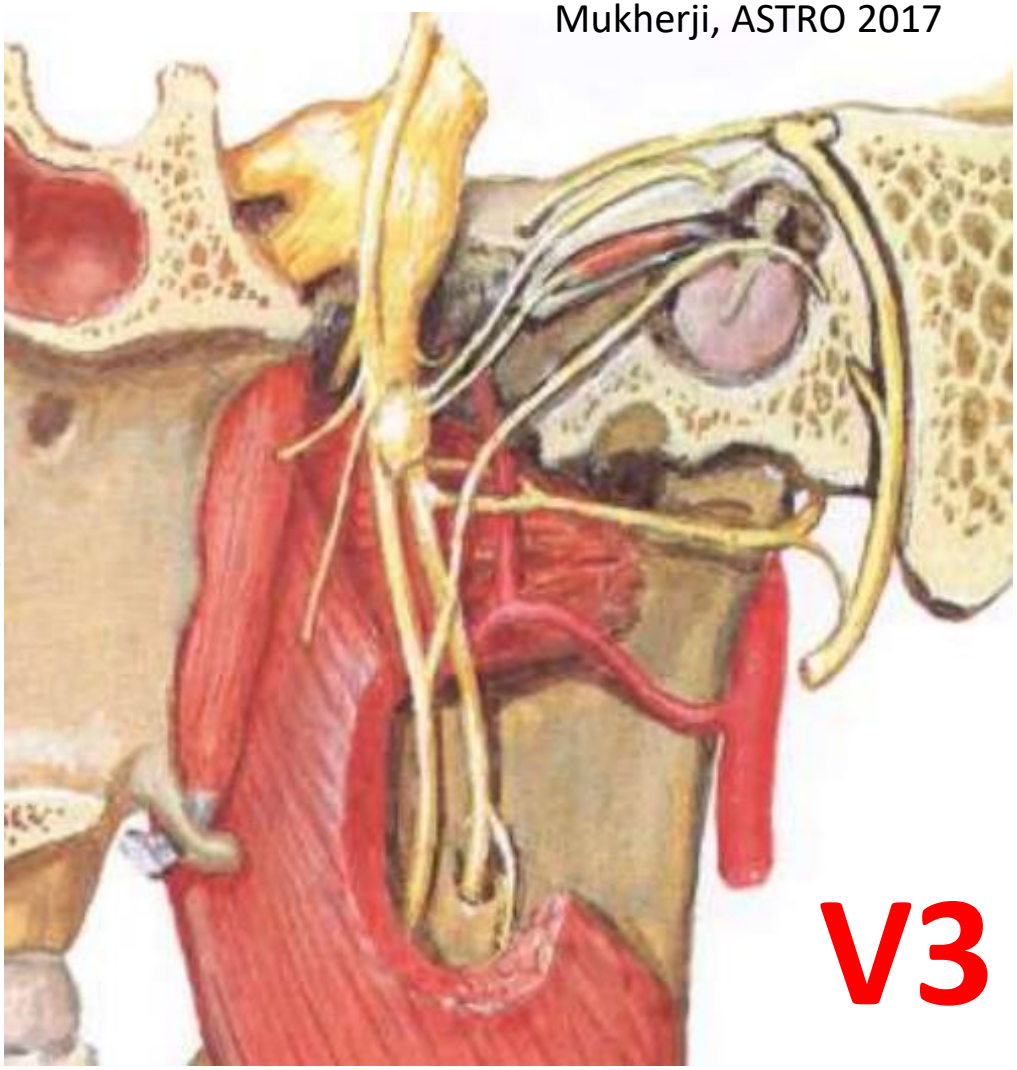




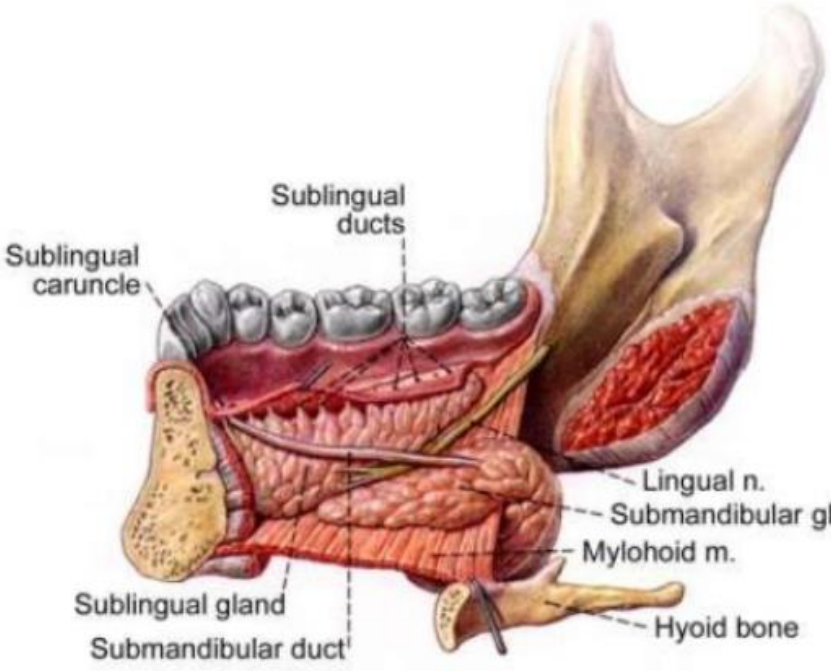
Ko, 2014

Mukherji, ASTRO 2017





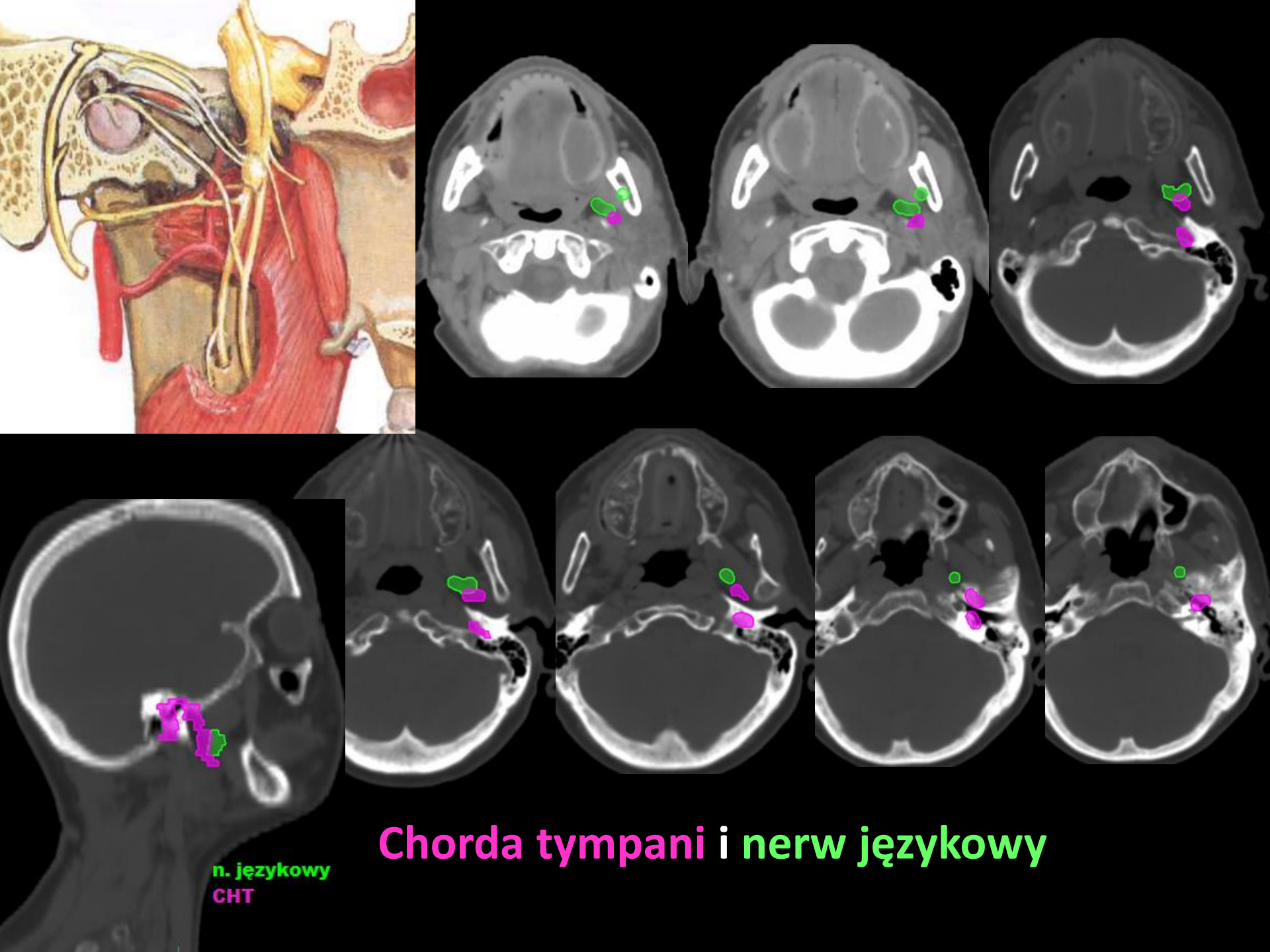
V3



ZESPOLENIA V3 – VII

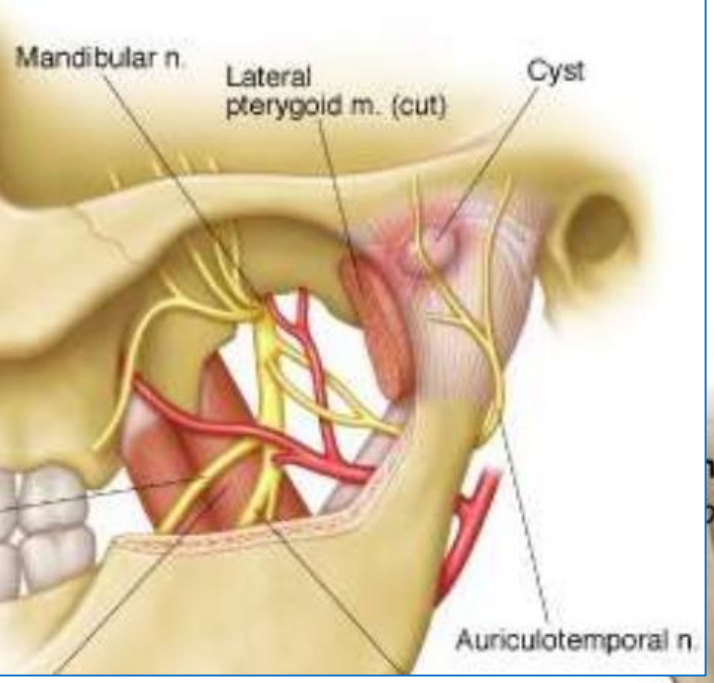
Chorda tympani VII – nerw językowy (V3)

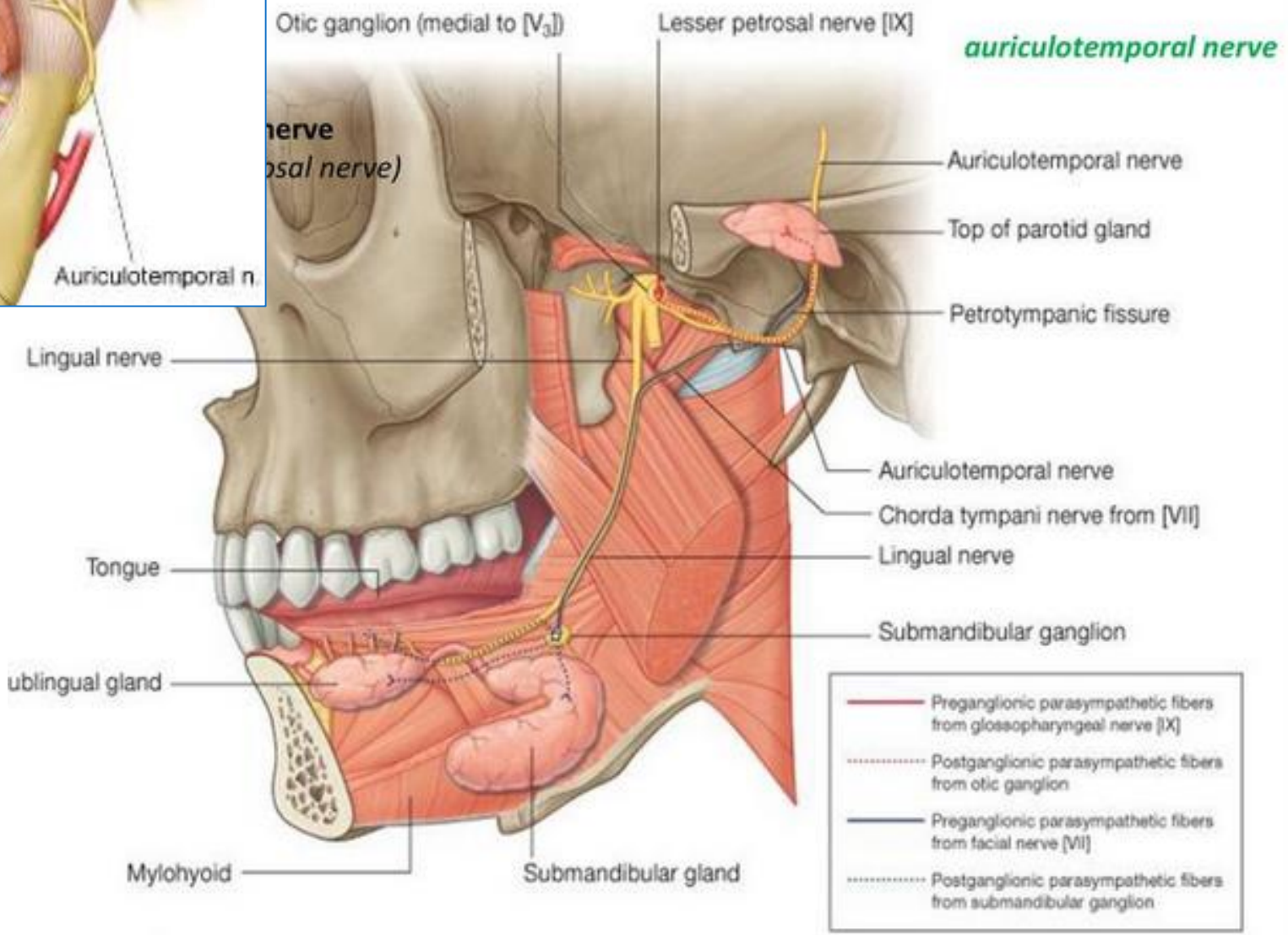
Nerw uszno-skroniowy ATN (V3) – VII



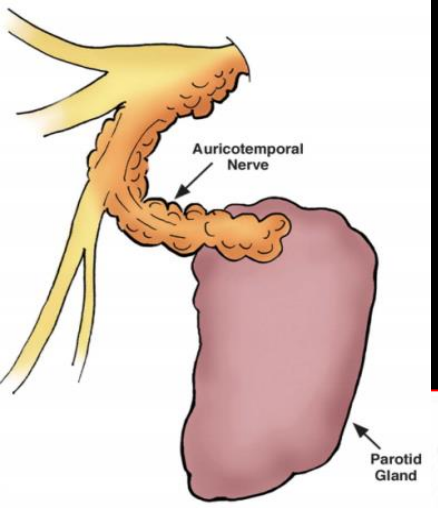
Chorda tympani i nerw językowy

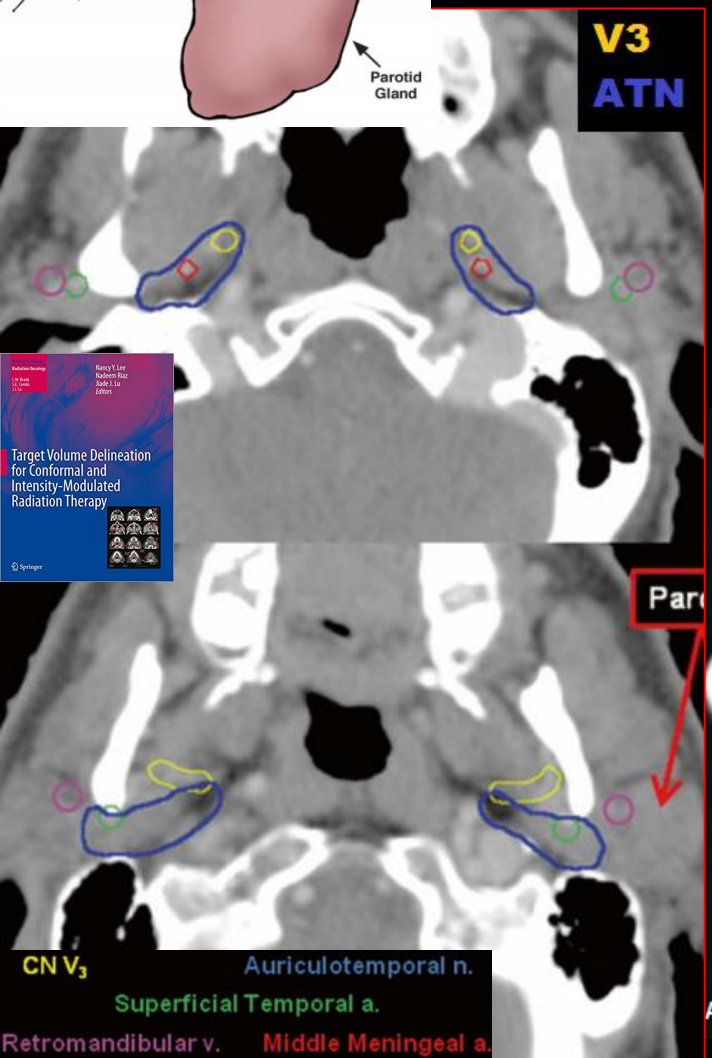
NERW USZNO-SKRONIOWY (V3)

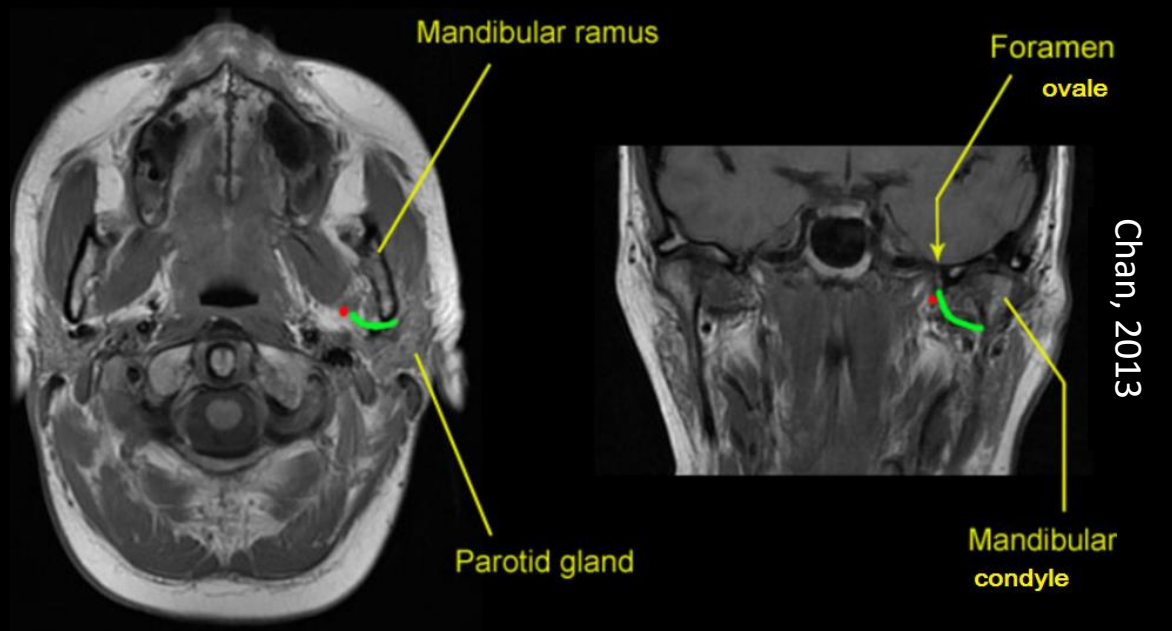


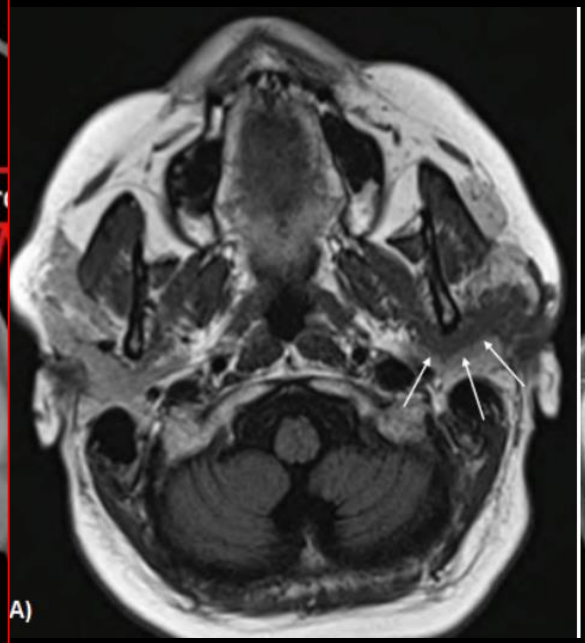


ATN: V3 → VII

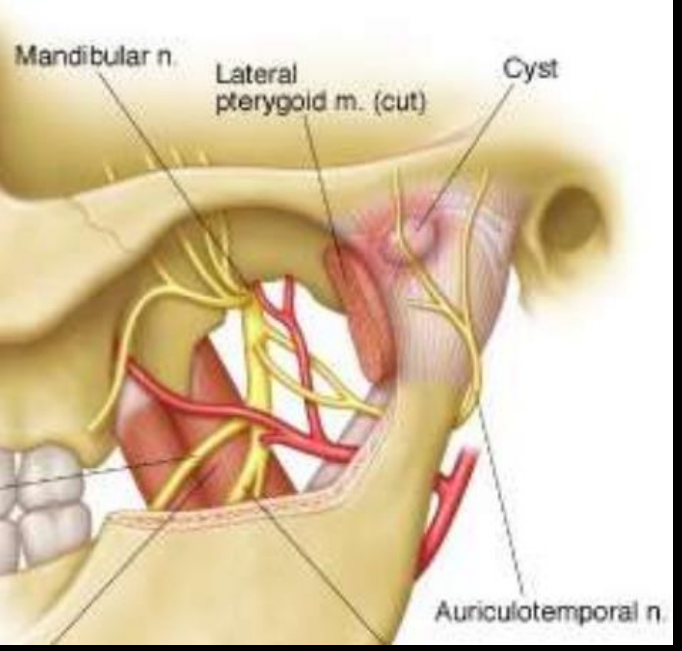

Auricotemporal Nerve
Parotid Gland

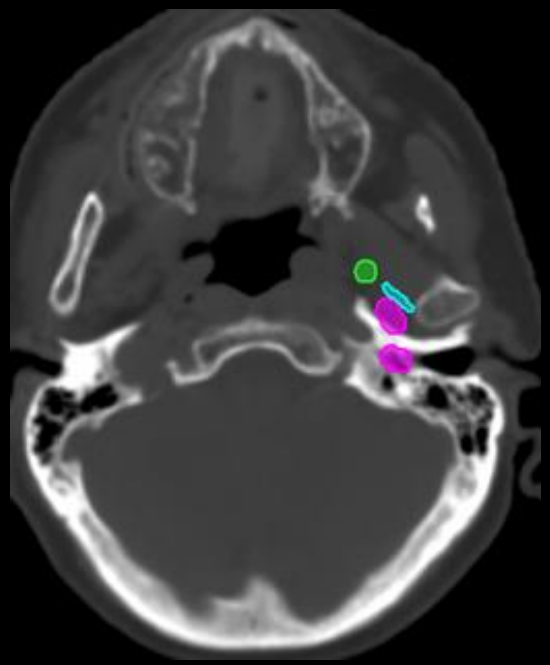

V3
ATN
Target Volume Delineation for Conformal and Intensity-Modulated Radiation Therapy
CN V3
Auriculotemporal n.
Superficial Temporal a.
Retromandibular v.
Middle Meningeal a.

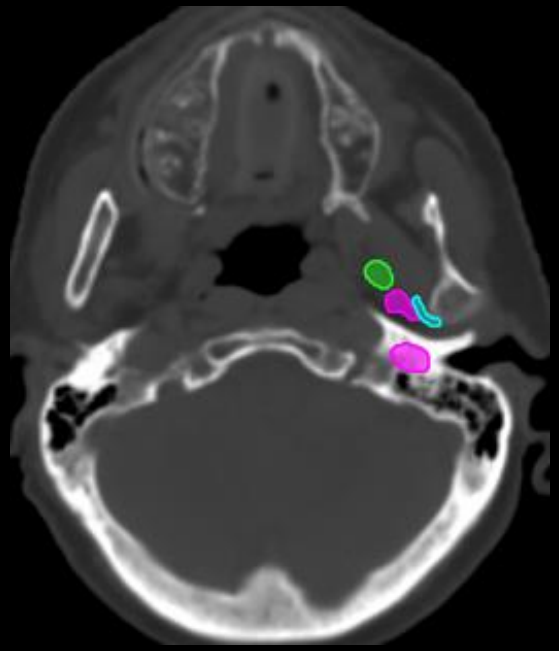

Mandibular ramus
Foramen ovale
Parotid gland
Mandibular condyle
Chan, 2013

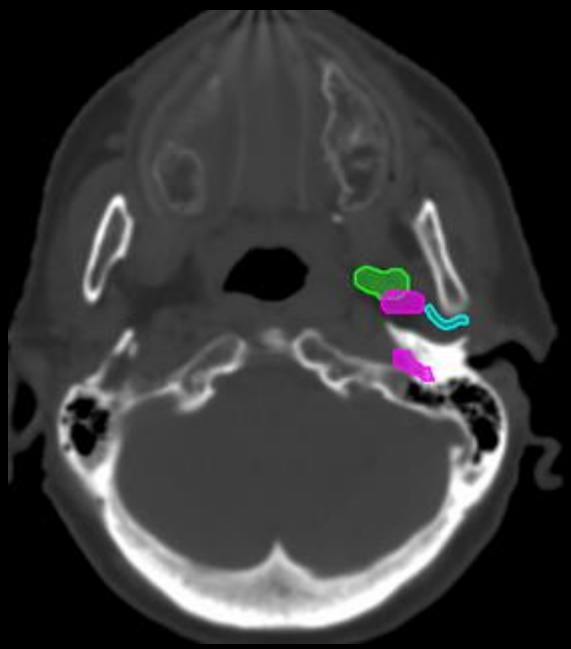

(A)

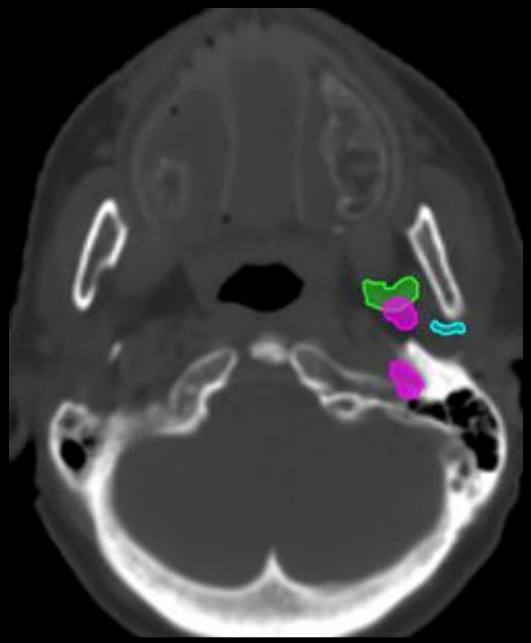

(B)
Saleem, 2014

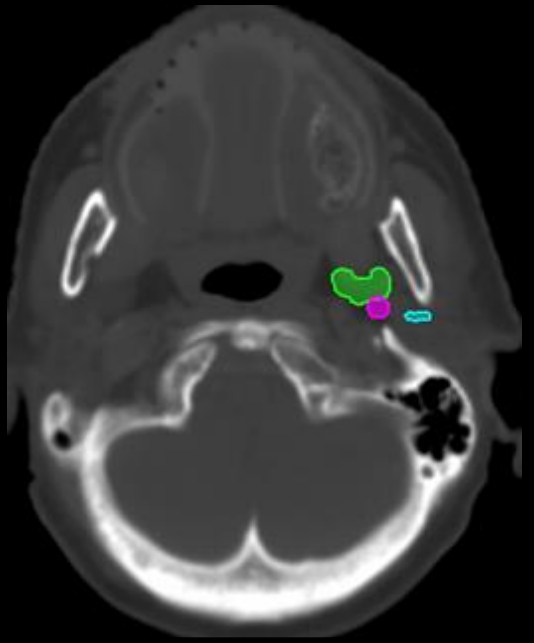






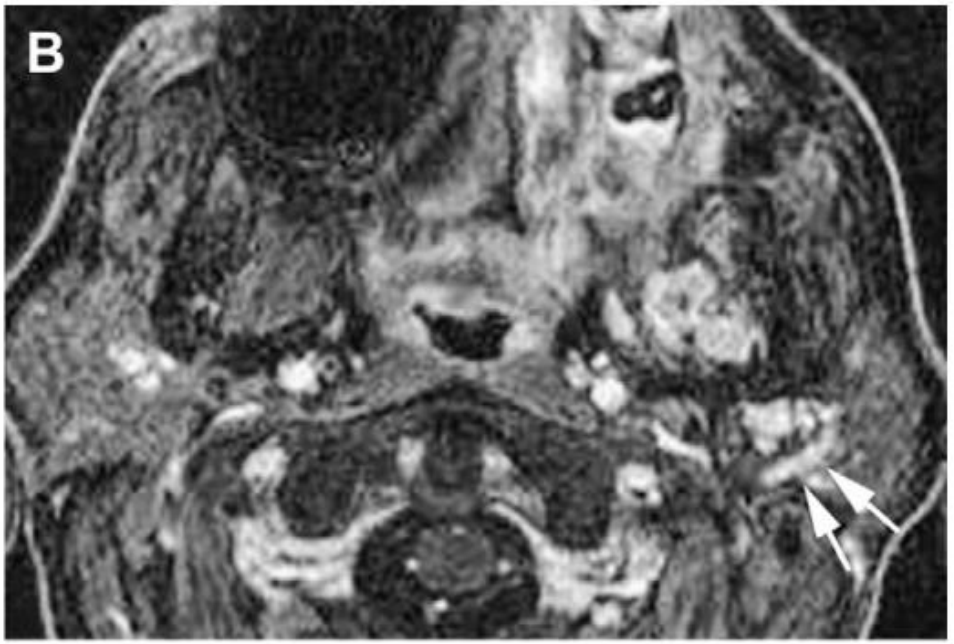






Chorda tympani, nerw językowy i ATN





ZESPOLENIA V3 – VII

Chorda tympani VII – nerw językowy (V3)

Nerw uszno-skroniowy ATN (V3) – VII

ACC dna jamy ustnej. Naciek drogą nerwu językowego.

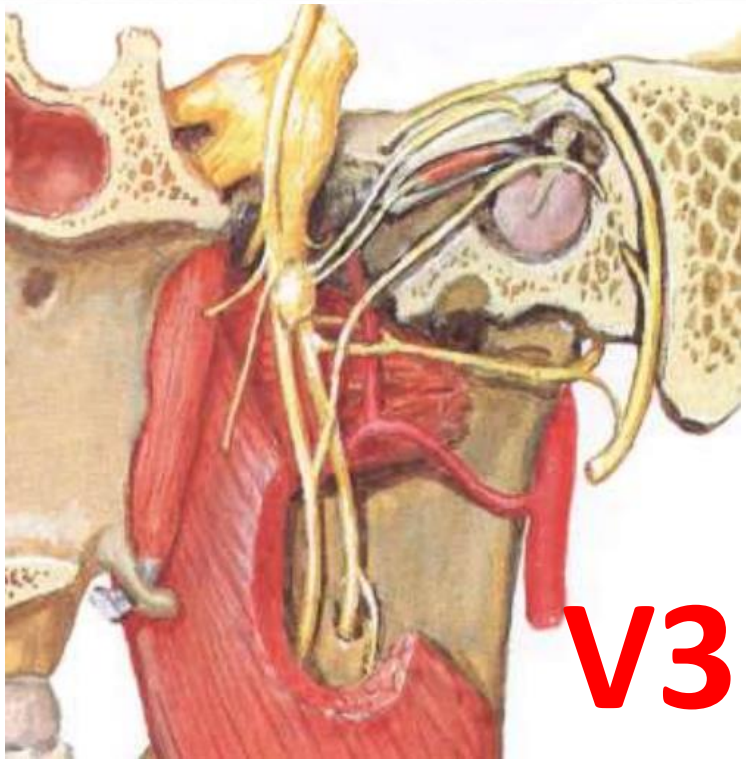
M. skrzydł. przyśrodkowy przesunięty przyśrodkowo (A – grot strzałki).

Dwa kierunki naciekania:

- przedniobocznie (IAN),

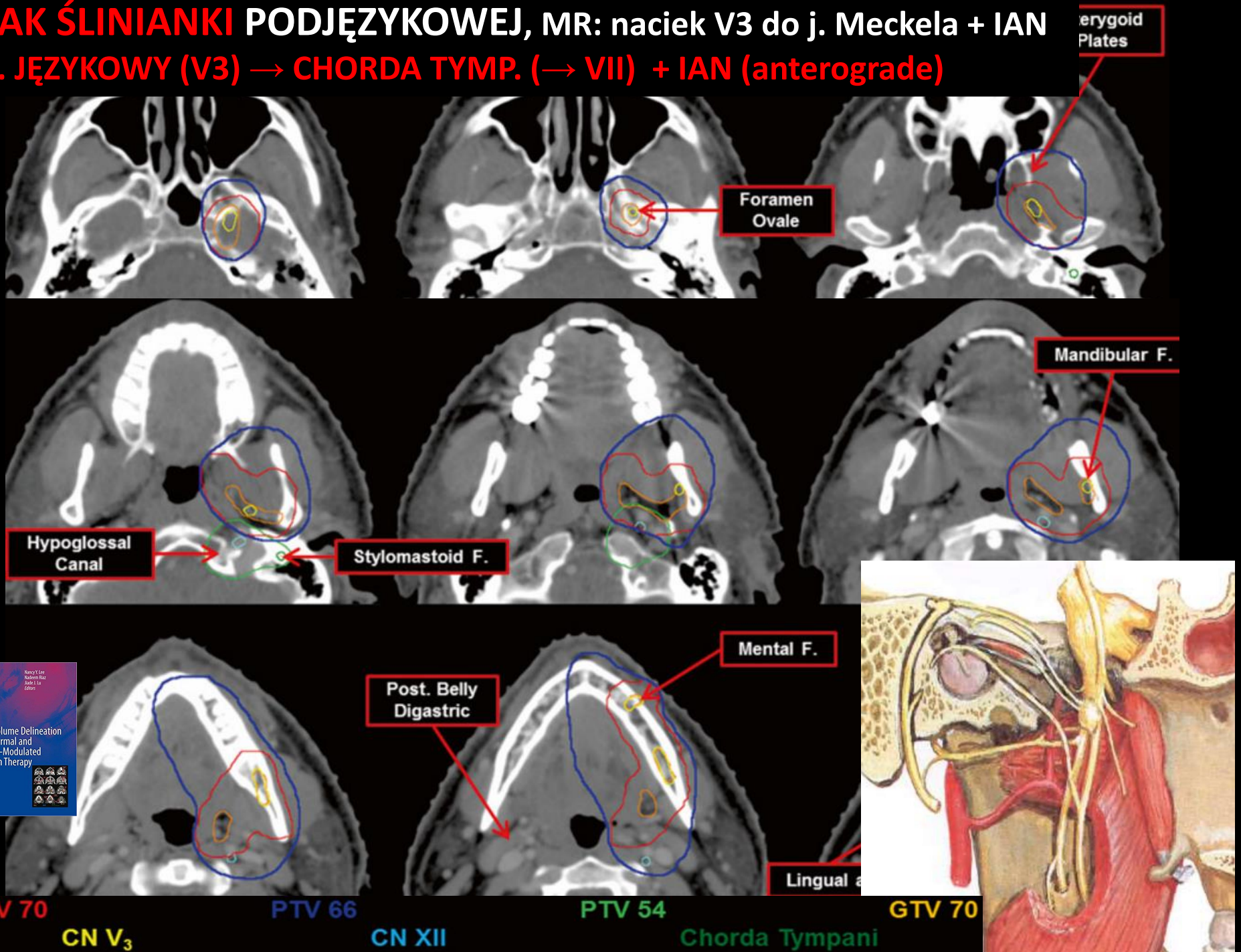
- tylnobocznie (ATN).

PNS w miąższu ślinianki (B) – drogą VII.



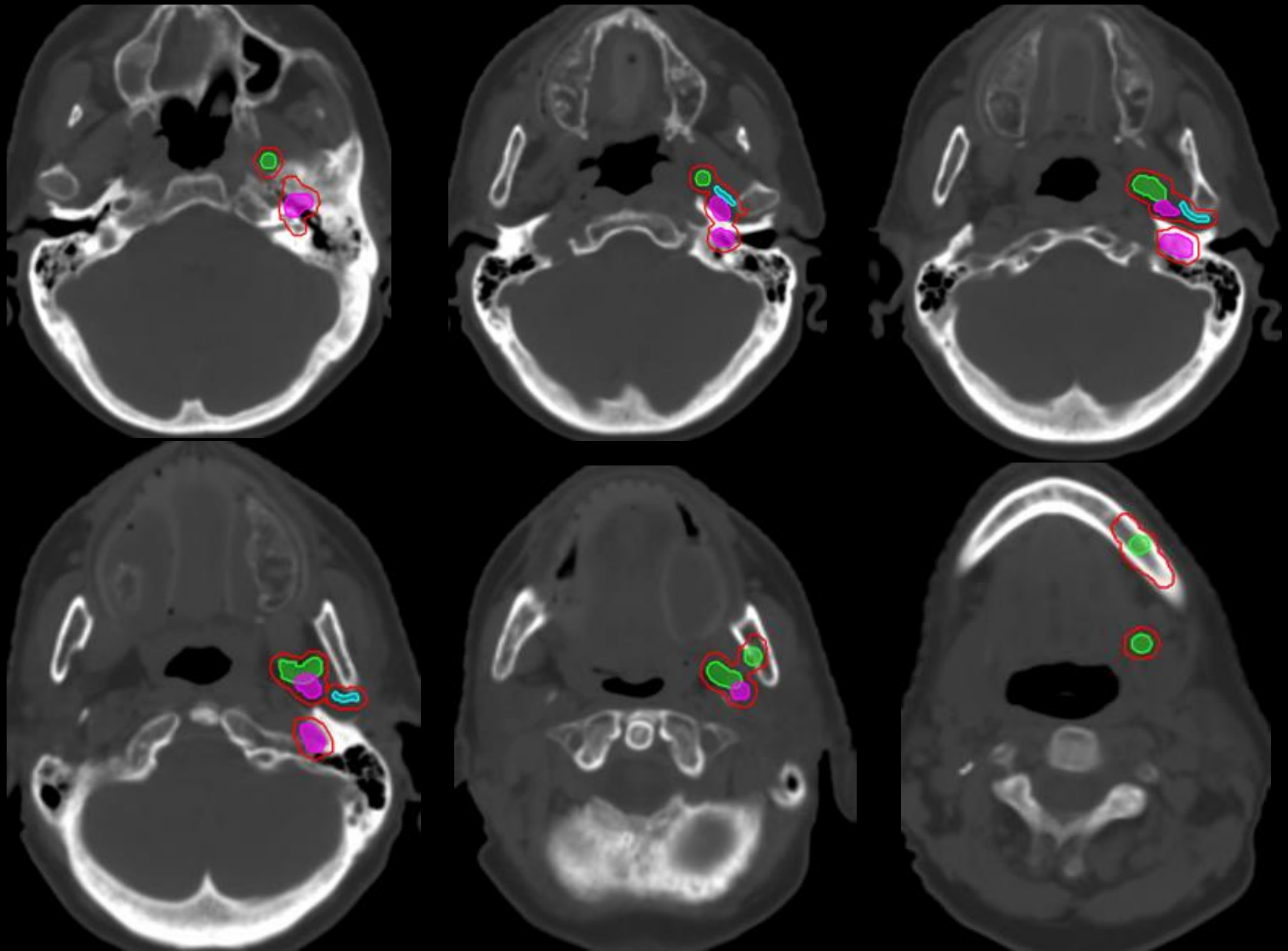
RAK ŚLINIANKI PODJĘZYKOWEJ, MR: naciek V3 do j. Meckela + IAN

N. JĘZYKOWY (V3) → CHORDA TYMP. (→ VII) + IAN (anterograde)

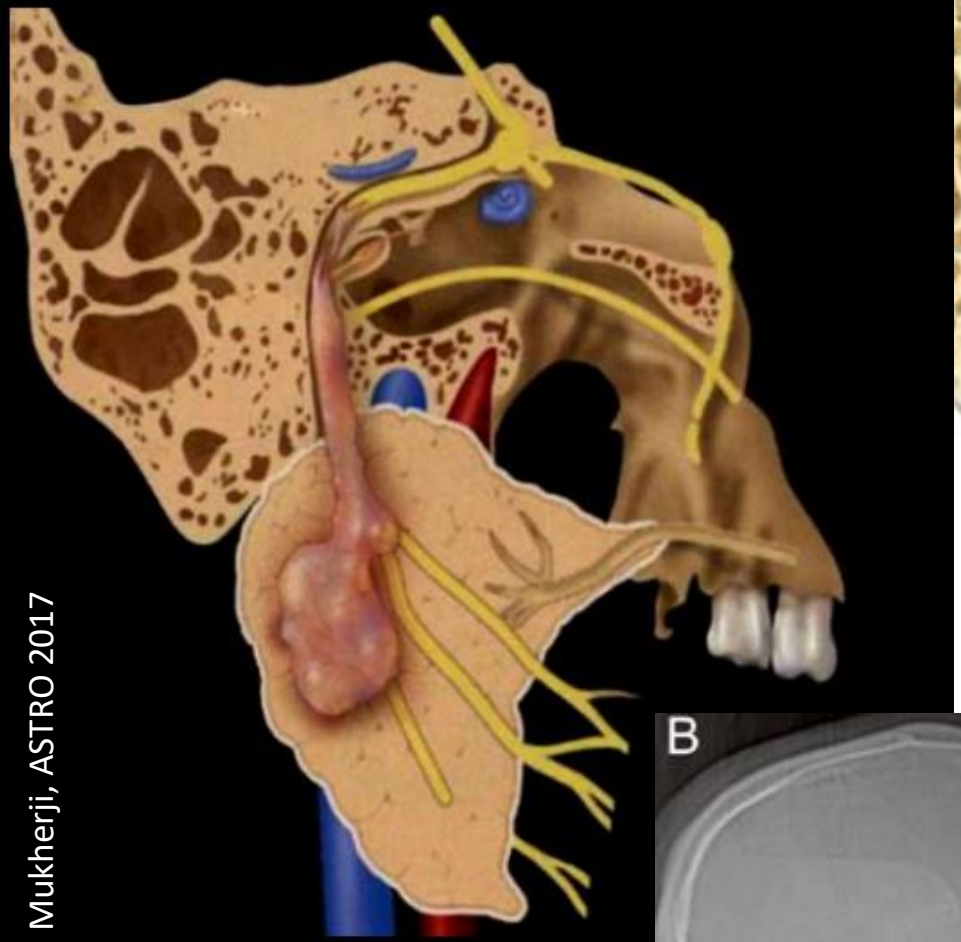


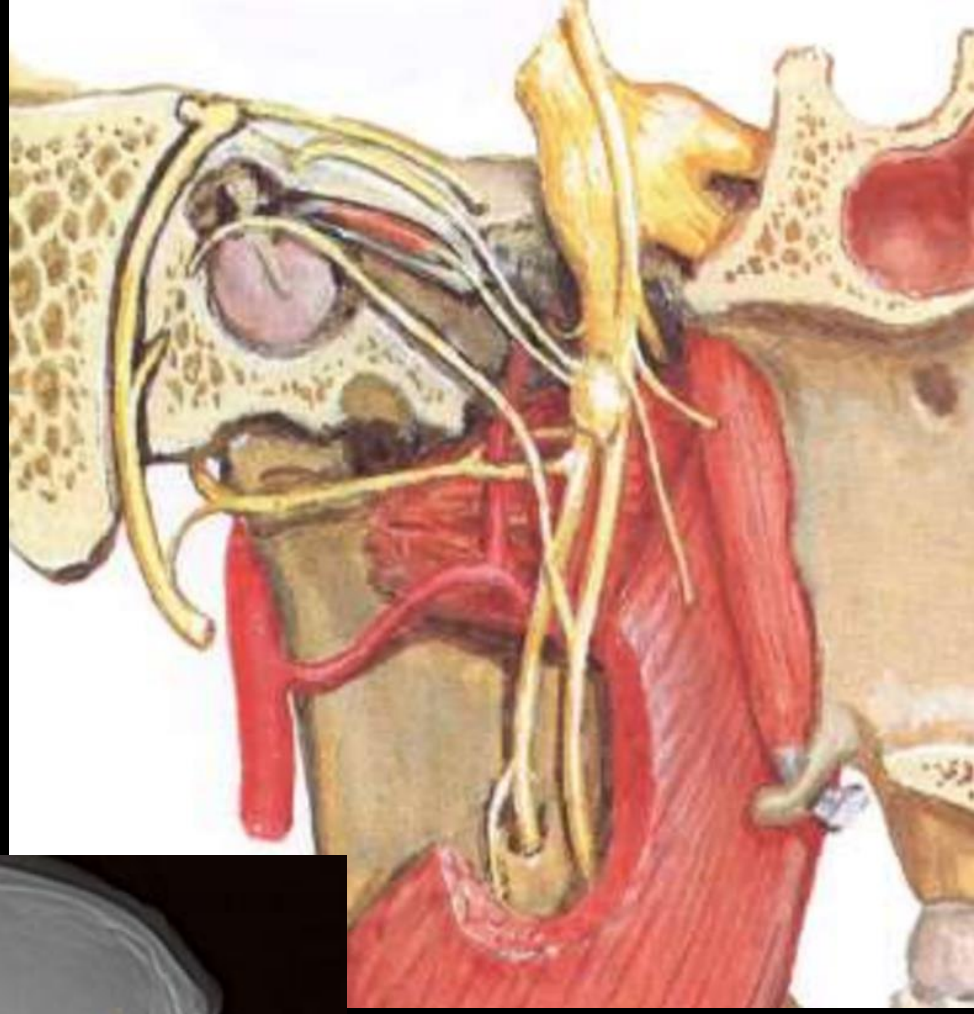
RAK ŚLINIANKI PODJĘZYKOWEJ, naciek V3 w MR do j. Meckela + IAN

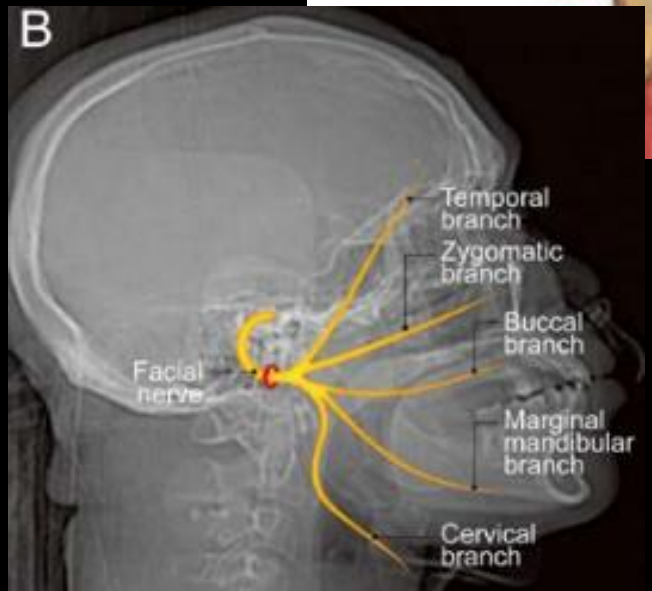
N. JĘZYKOWY (V3) + CHORDA TYMP. (→ VII) + IAN (anterograde) + ATN



Facial Nerve







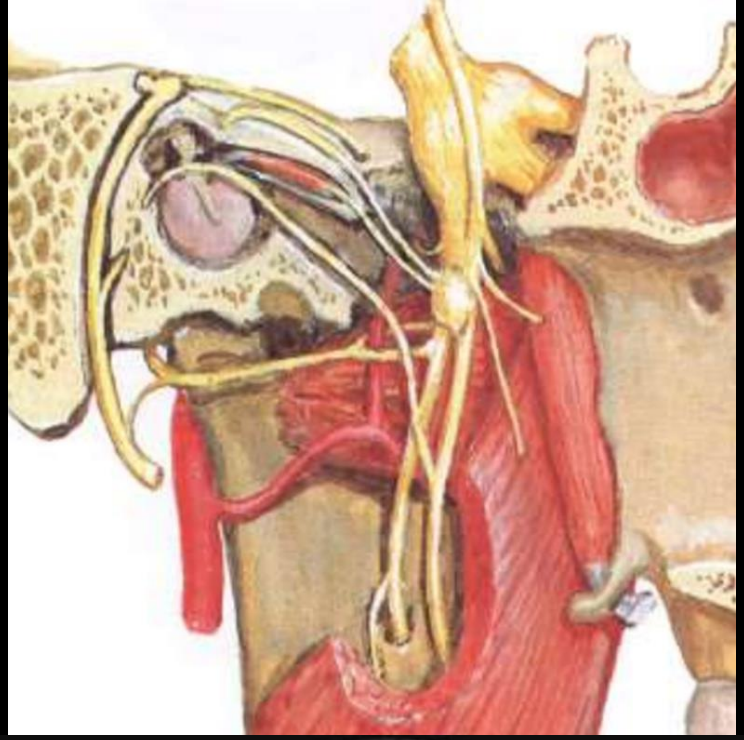
VII

Mukherji, ASTRO 2017


Przebieg NC VII w piramidzie kości skroniowej

VII
GSPN
ATN
CHT

Mukherji, ASTRO 2017





Gluck, 2009

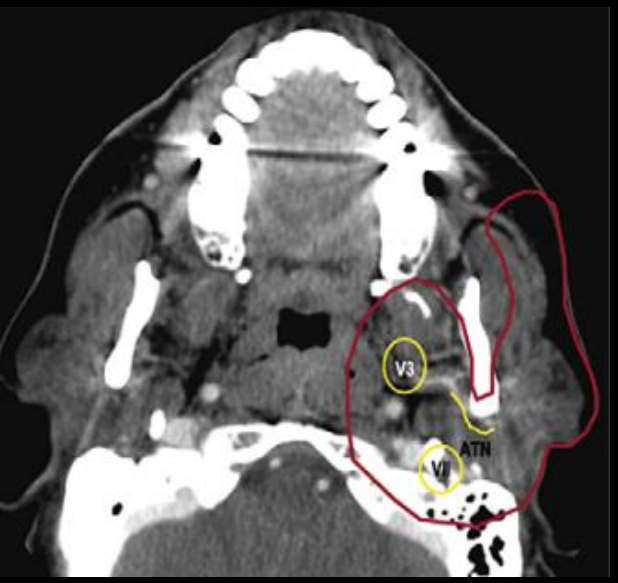


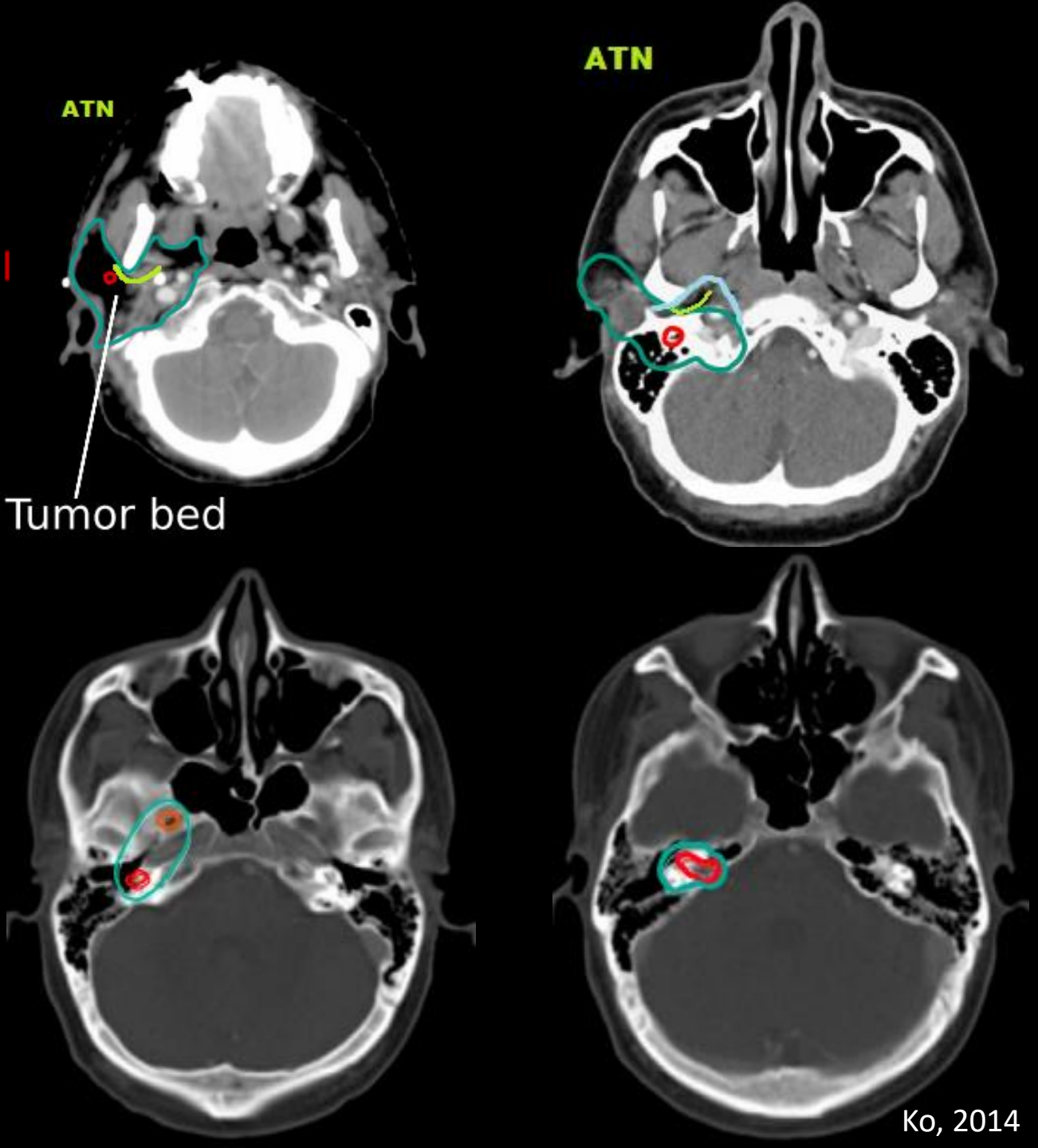
ACC ŚLINIANKI PRZYUSZNEJ

Facial nerve, CNVII

Mandibular nerve, CNV_3

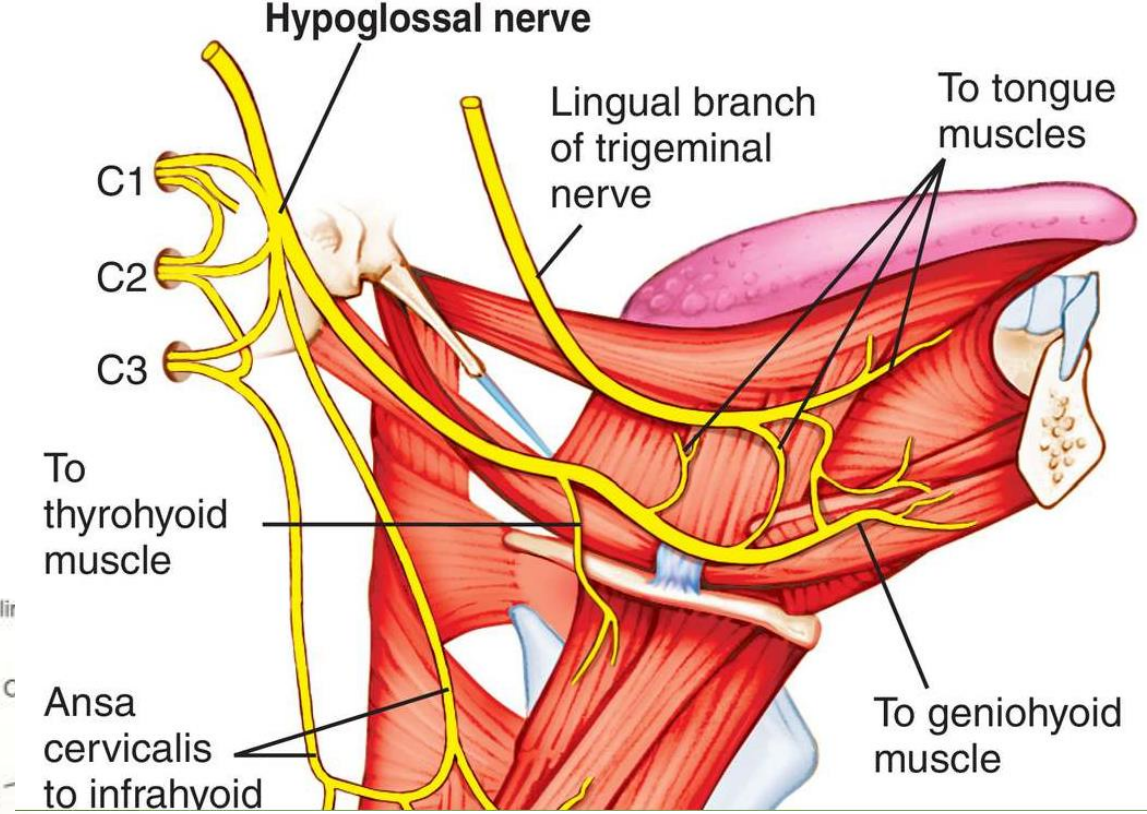
CTV

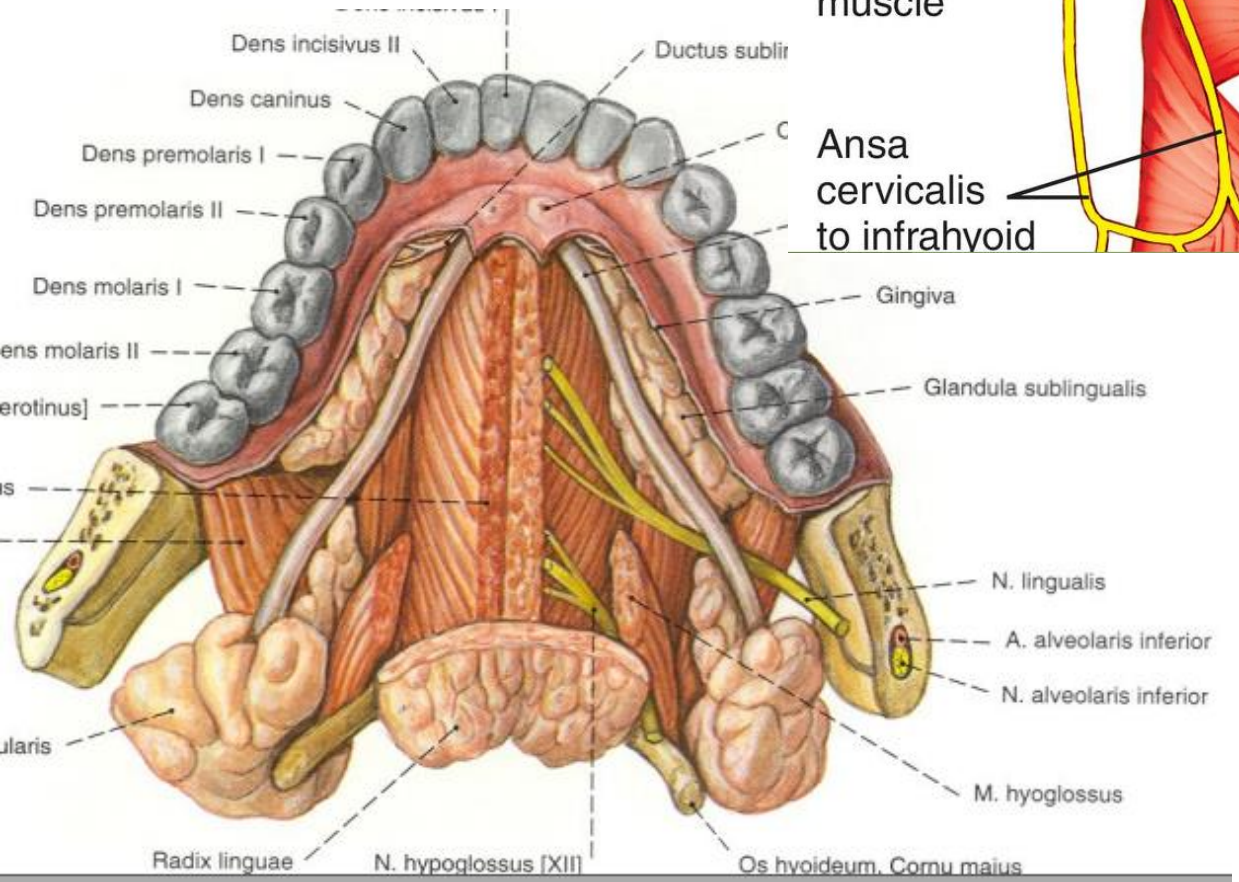




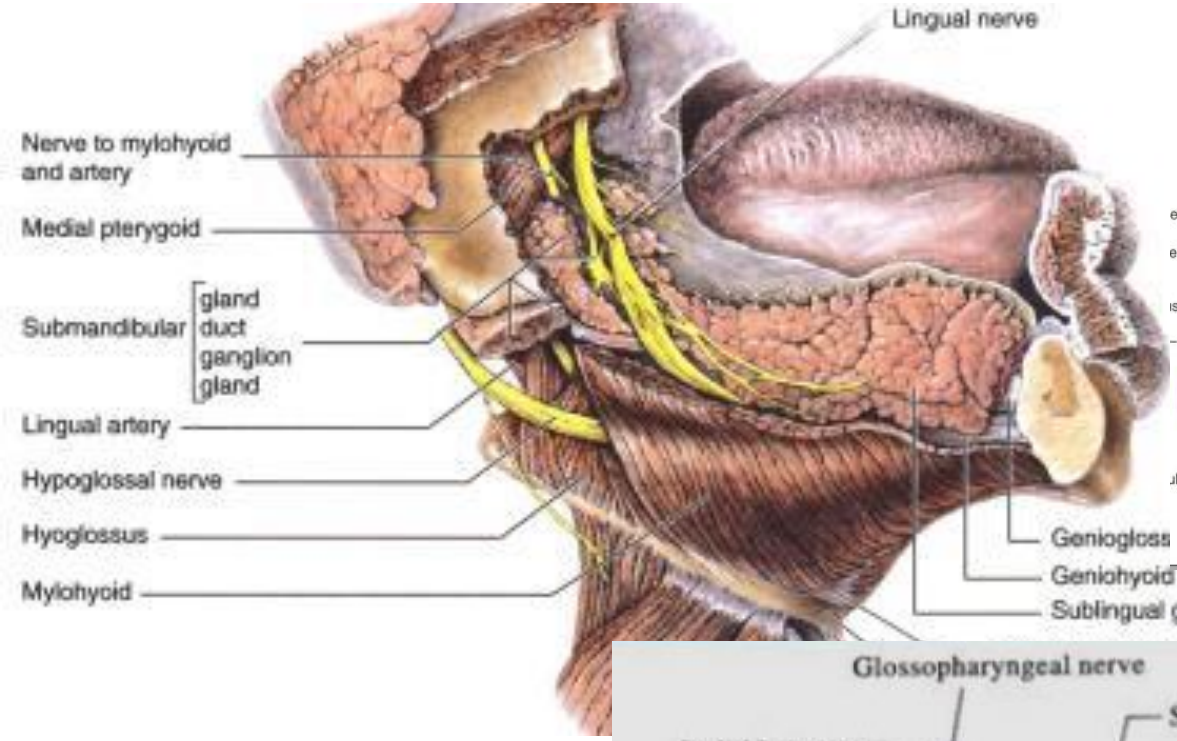
Ko, 2014

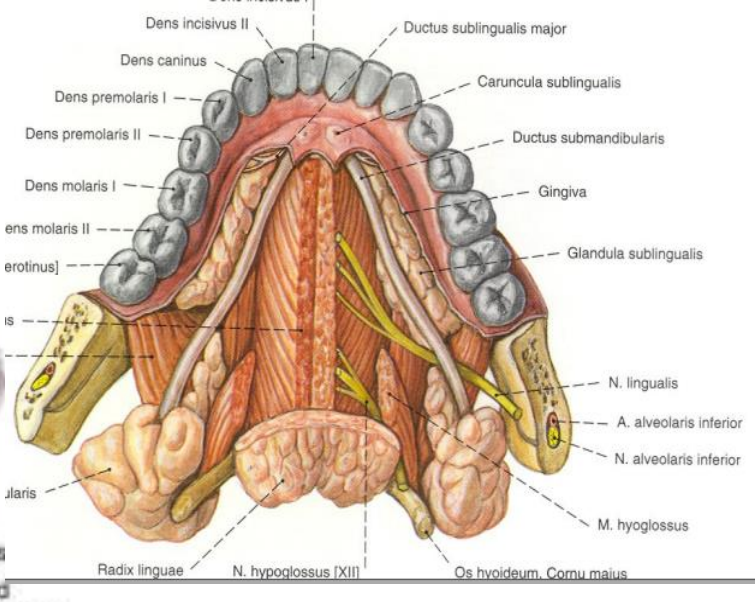
Nerw podjęzykowy



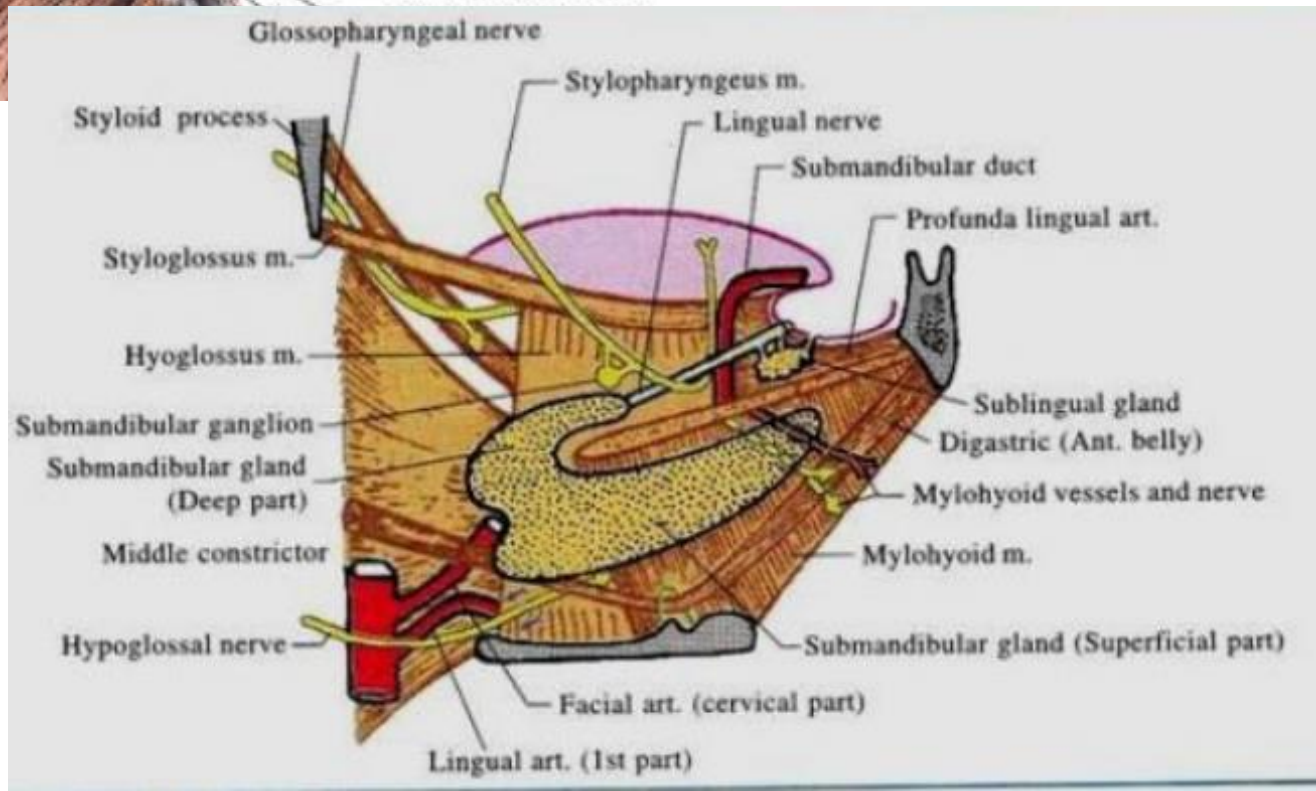


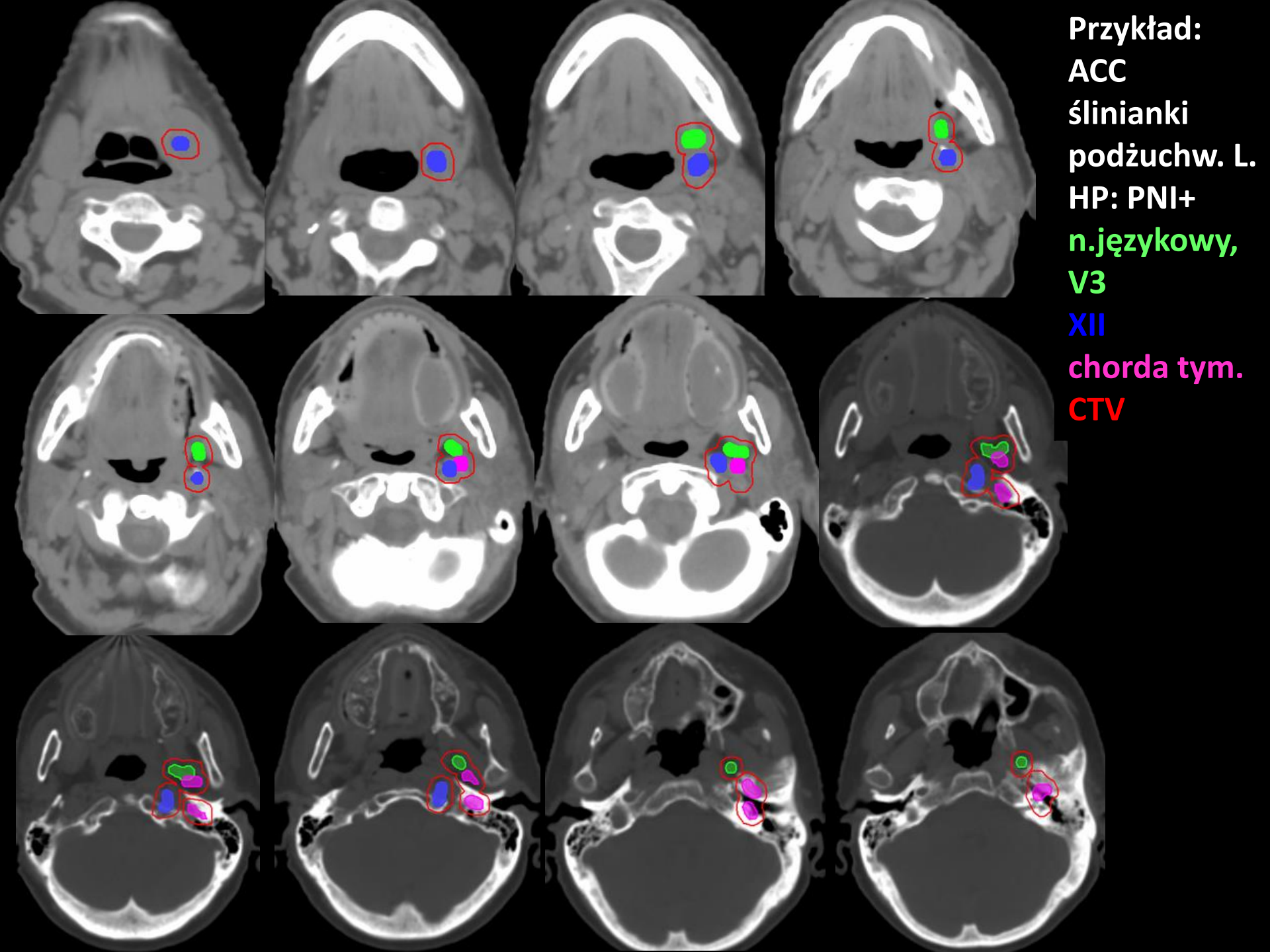
XII





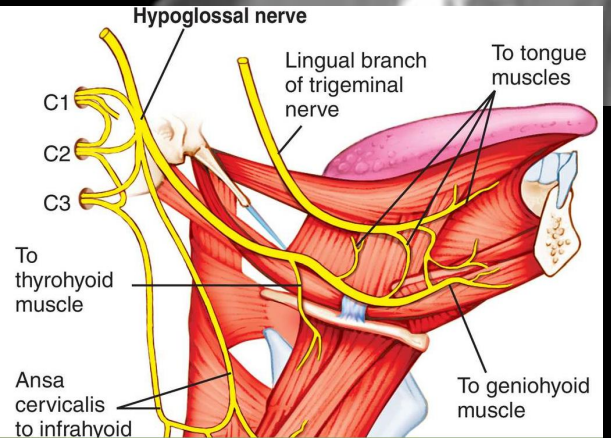
Nerw językowy (V3) i podjęzykowy (XII) a ślinianki – podżuchwowa i podjęzykowa: stosunki anatomiczne




Przykład:
ACC
ślinianki
podżuchw. L.
HP: PNI+
n.językowy,
V3
XII
chorda tym.
CTV

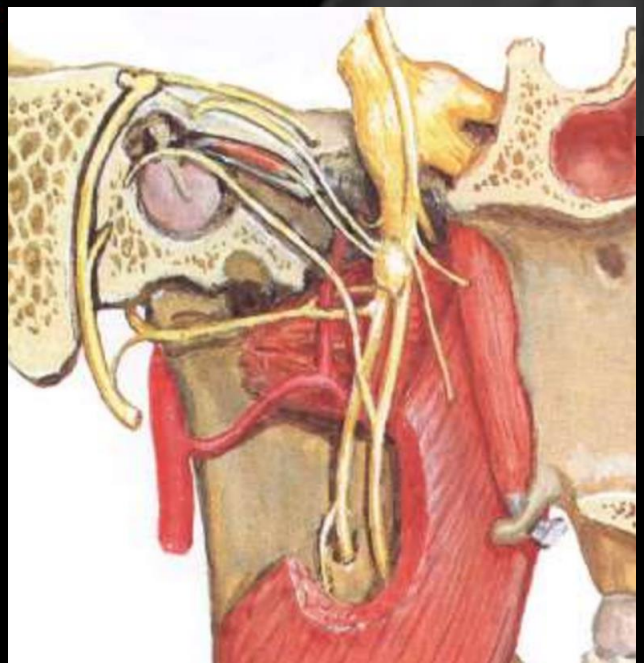
n. językowy V3

XII



n. językowy V3
CHT

n. językowy
CHT



DZIĘKUJĘ ZA UWAGĘ

jsocha@wim.mil.pl