Gesundheit
kommt von Herzen.

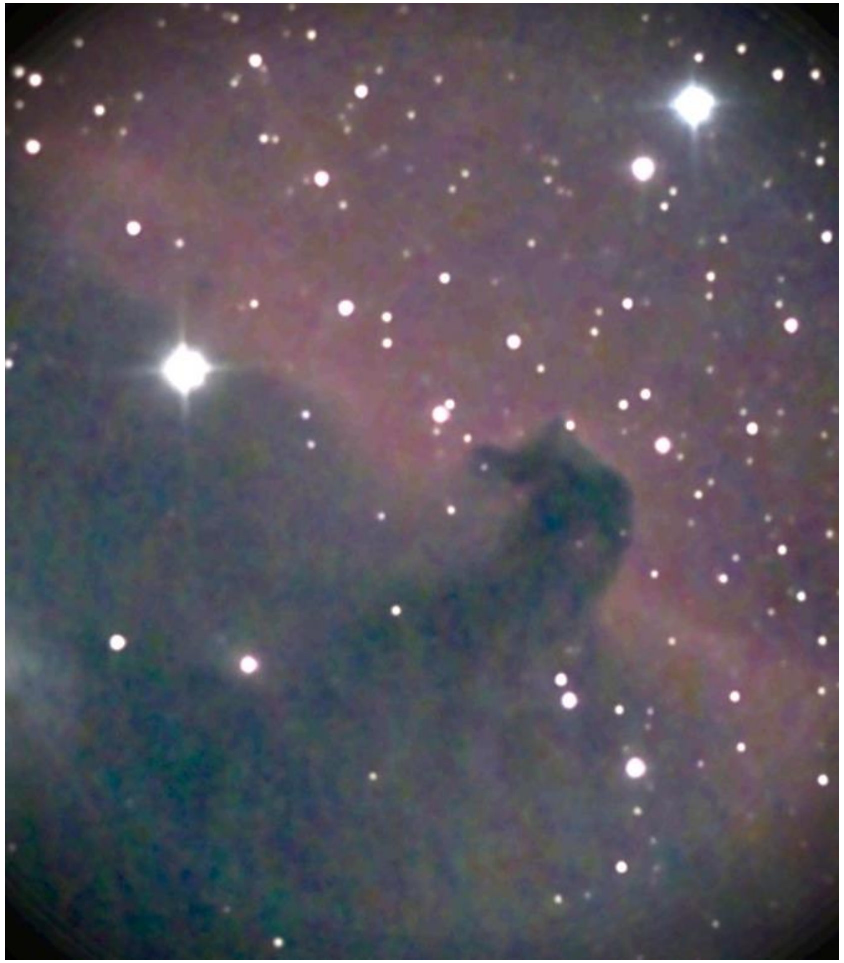
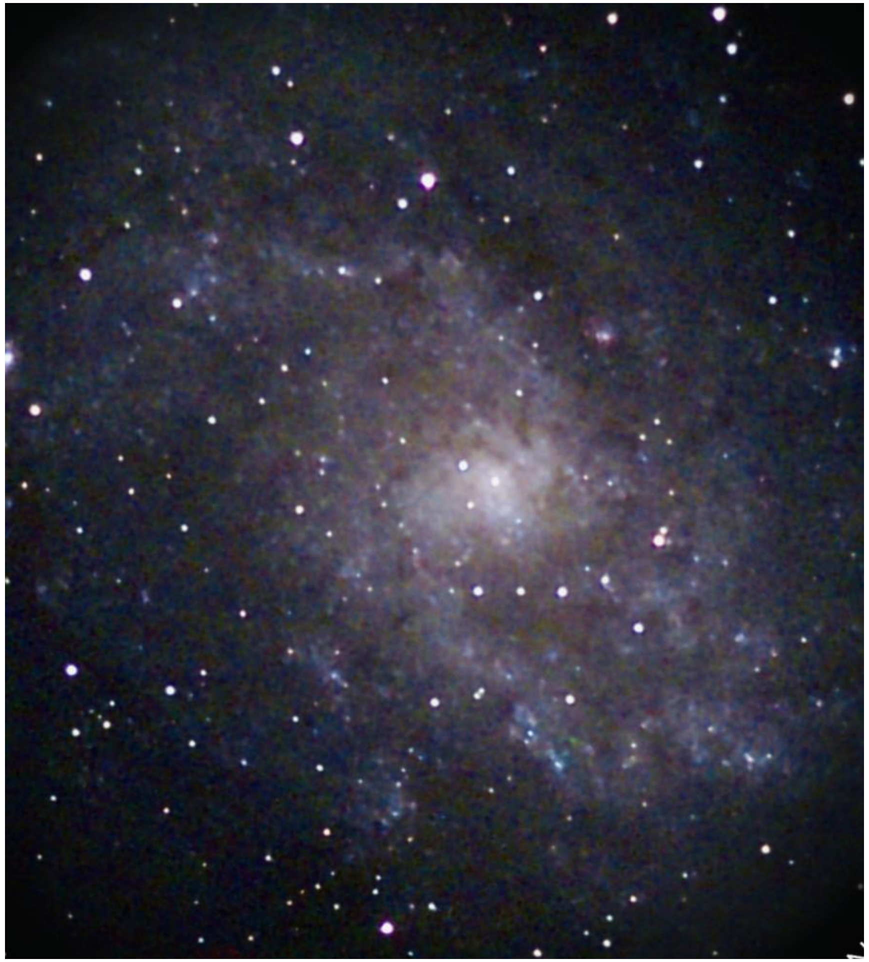
Herz-Jesu
Krankenhaus Wien

Blockaden an Hals und Kopf

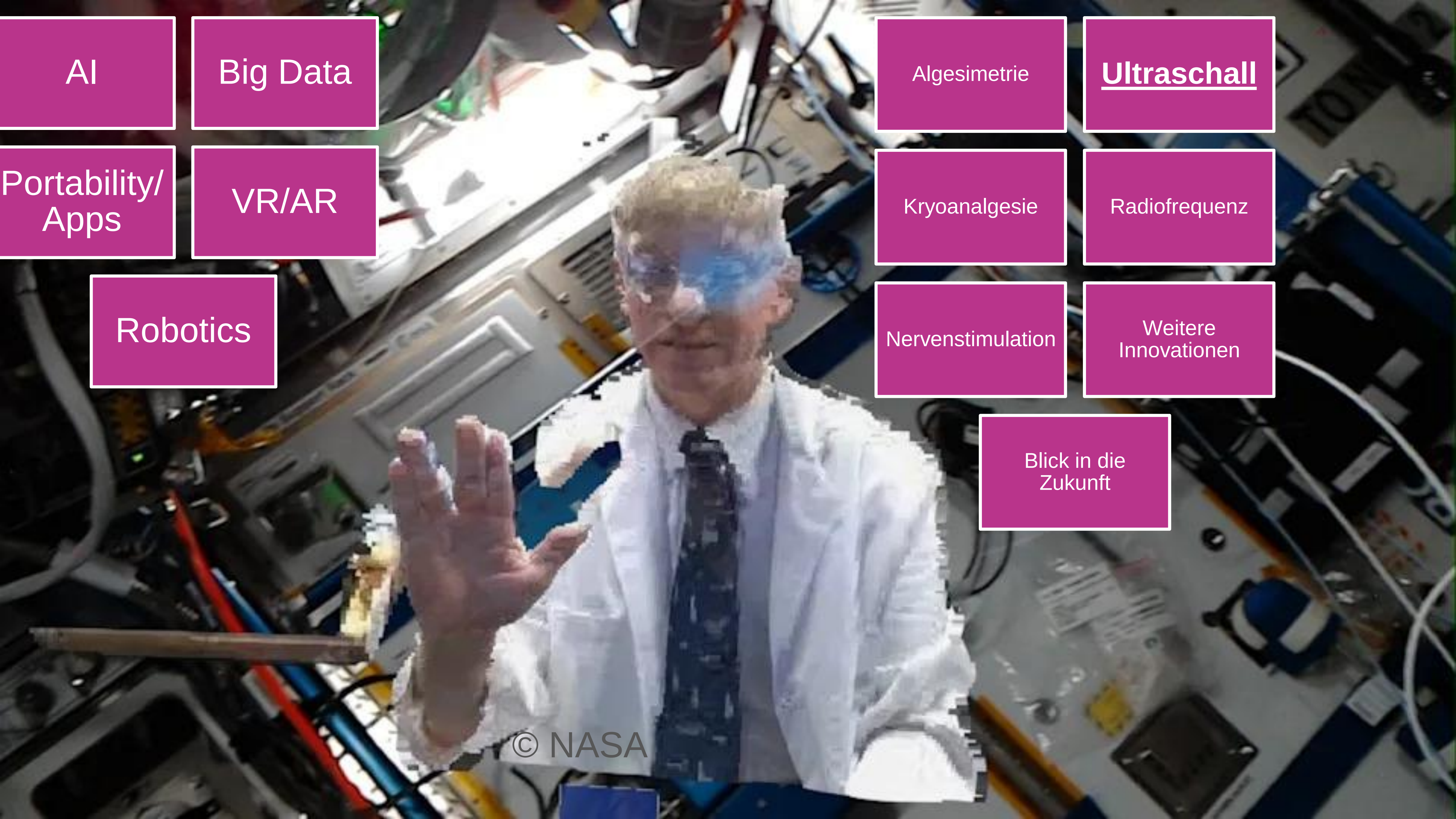
Prim. Dr. Manfred Greher, MBA

60. Innsbrucker WS Regionalanästhesie
18.-19.9.2023


LACERTA
CELESTRON

© Paramount Pictures, YouTube, M. Greher



AI

Big Data

Portability/ Apps

VR/AR

Robotics

Algesimetrie

Ultraschall

Kryoanalgesie

Radiofrequenz

Nervenstimulation

Weitere Innovationen

Blick in die Zukunft

Herz-Jesu
Krankenhaus Wien

OCTOBER 4, 2020

AI predicts patients at highest risk for severe pain, increased opioid use post-surgery

by American Society of Anesthesiologists

Artificial intelligence (AI) used in machine learning models can predict which patients are at highest risk for severe pain after surgery, and help determine who would most benefit from personalized pain management plans that use non-opioid alternatives, suggests new research being presented at the ANESTHESIOLOGY 2020 annual meeting.

In the two-part study, researchers looked at data from 5,944 patients who had a wide variety of surgeries, including gallbladder removal, hysterectomy, hip replacement and prostate surgery. Of those, 1,287 (22%) had consumed 90 morphine milligram equivalent (MME) in the first 24 hours after surgery, which is considered a high dose. In the first part of the study, they used 163 potential factors to predict high pain post-surgery, based on a literature search and consultation with experts. From there they created three machine learning algorithm models (logistical regression, random forest and artificial neural networks) that mined the patients' medical records and whittled the 163 predictor factors down to those which most accurately predicted patients' pain severity and potential opioid needs after surgery.

In the second part, they compared what the models predicted to actual opioid use in those same patients. They determined all three models had similar predictive accuracy overall: 81% for logistical regression and random forest methods and 80% for artificial neural networks. That means the models accurately identified which people were more likely to have severe pain and need higher doses of opioids about 80% of the time.

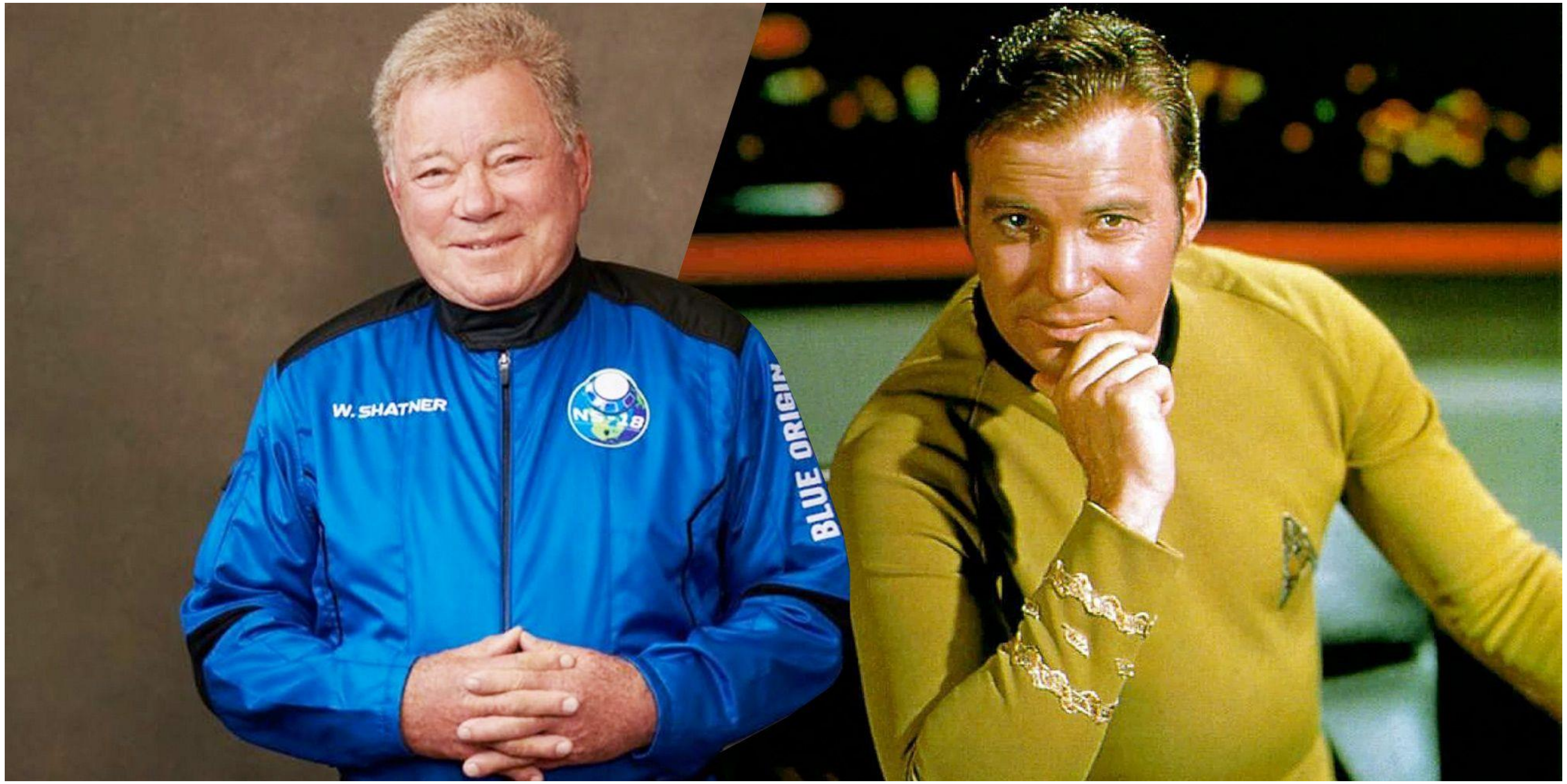
"Electronic medical records are a valuable and underused source of patient data and can be employed effectively to enhance patients' lives," said Dr. Soens. "Selectively identifying patients who typically need high doses of opioids after surgery is important to help reduce opioid misuse."

The role for regional anesthesia in medical emergencies during deep space flight

Daring discourse, RAPM Oct 21

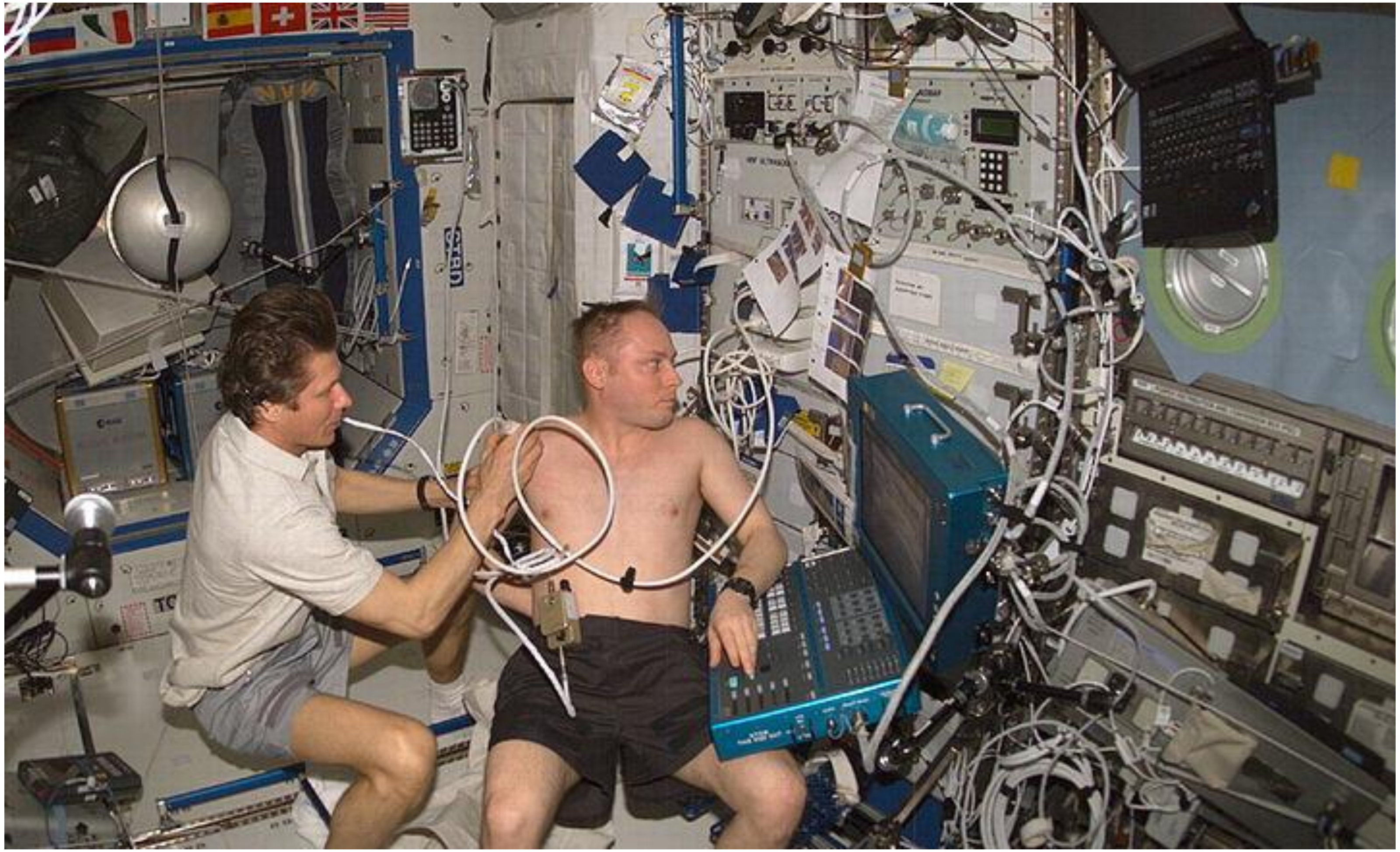
Julia Scarpa,[1] Christopher L Wu [1,2]

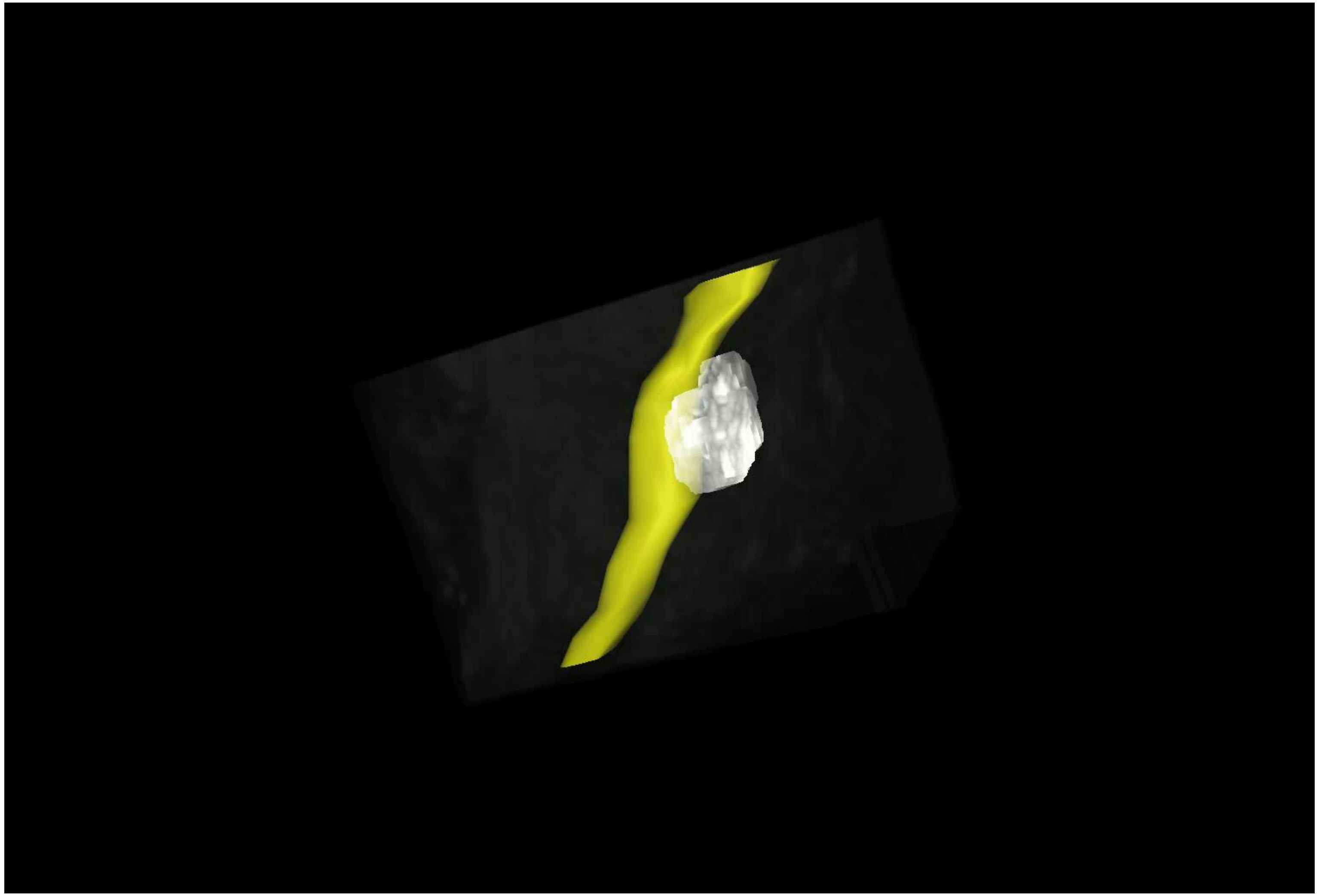
ABSTRACT
As humanity presses the boundaries of space exploration and prepares for long-term interplanetary travel, including to Mars, advanced planning for the safety and health of the crewmembers requires a multidisciplinary approach. In particular, in the event of a survivable medical emergency requiring an interventional procedure or prolonged pain management, such as traumatic limb injury or rib fracture, anesthetic protocols that are both safe and straightforward to execute must be in place. In this daring discourse, we discuss particular considerations related to the use of regional techniques in space and present the rationale that regional anesthesia techniques may be the safest option in many medical emergencies encountered during prolonged space flight.



Herz-Jesu Krankenhaus Wien

Ultraschall-gezielte Regionalanästhesie und Schmerztherapie





Fallbeispiel:

- 69-jähriger Patient
- seit 2 Monaten mehrmals am Tag linksseitig brennende Schmerzen am Mundboden und Gaumen (bis VAS 9)
- auslösbar durch Schlucken, Essen oder Gähnen
- 1x Sturz nach Kollaps
- medikamentös therapierefraktär!
- St. p. Laminekt. /Diskusprotr. C3-5, Paraproteinämie
- Rezentes Schädel-MRT: im Wesentlichen o.B.
- Verschiedene FA, ohne klare Diagnose

Glossopharyngeusneuralgie, erstbeschrieben 1910

- Nervus IX
  - Innerviert sensorisch die Mucosa des Pharynx, Vallecula, Vorderfläche der Epiglottis, weichen Gaumen, Tonsillen und das hintere Drittel der Zunge.
  - Motorisch: M. stylopharyngeus
  - Parasympathische Fasern zur Parotis
  - Geschmacksnerv für das hintere Drittel der Zunge

Herz-Jesu Krankenhaus Wien

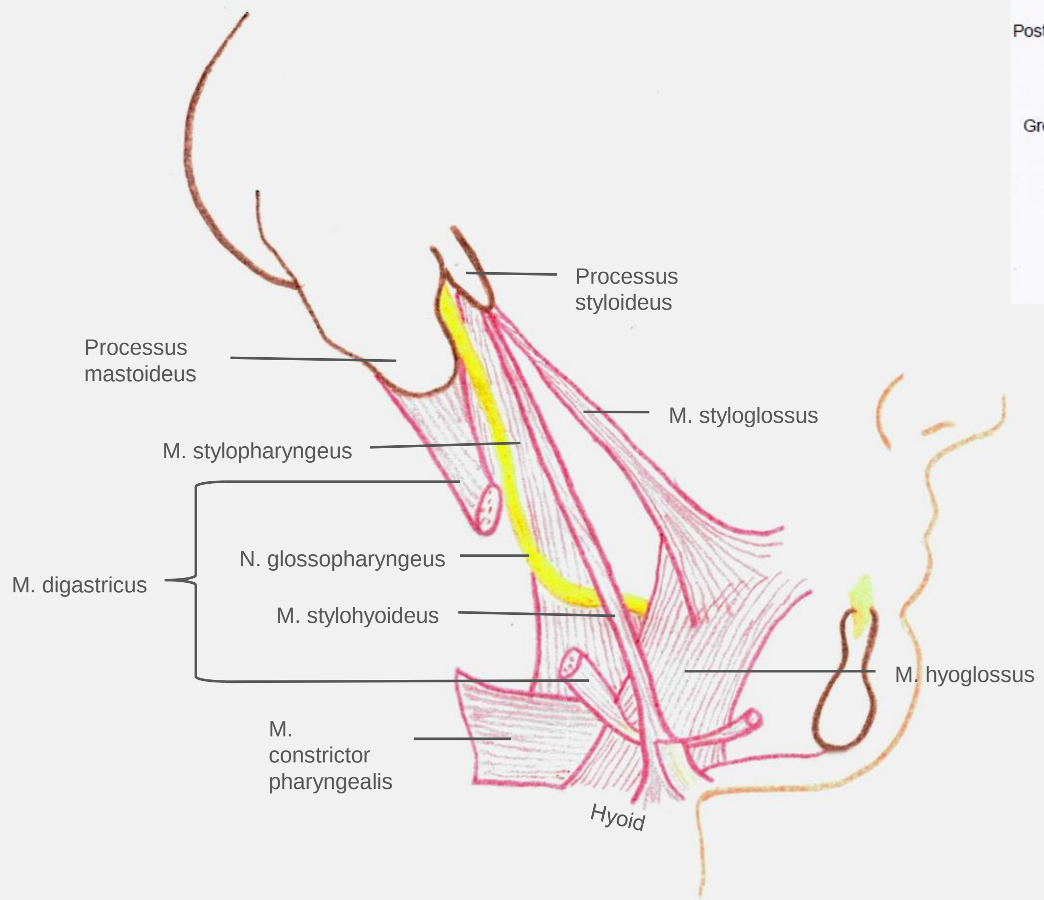
Verdachtsdiagnose: Glossopharyngeusneuralgie - Was nun?

- Diagnostische Nervenblockade

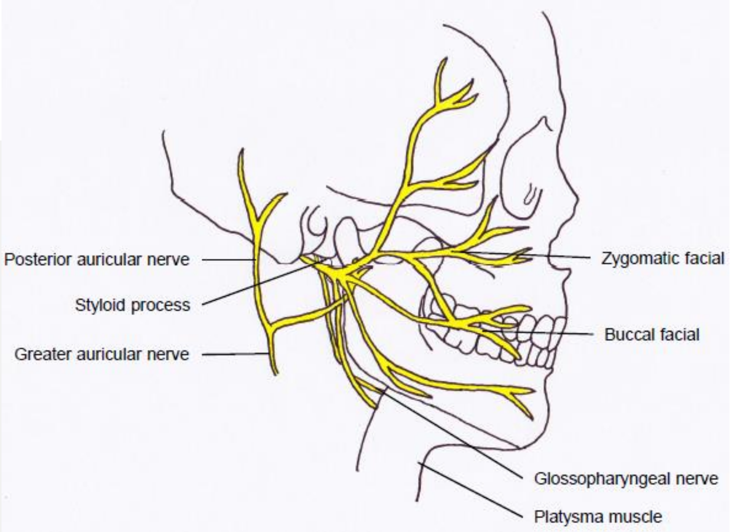
  - Früher: tiefe, blinde, intraorale Technik

  - 1989: (US)- Technik am Proc. styloideus

  - Heute: G25 Nadel, 3ml Mepivacain 1%, US-gezielt nach Identifikation des Hyoids und der Glandula submandibularis im parapharyngealen Raum, unter der oberflächlichen & tiefen Muskelschicht, caudal des Kieferwinkels



Processus styloideus
Processus mastoideus
M. styloglossus
M. stylopharyngeus
N. glossopharyngeus
M. digastricus
M. stylohyoideus
M. hyoglossus
M. constrictor pharyngealis
Hyoid

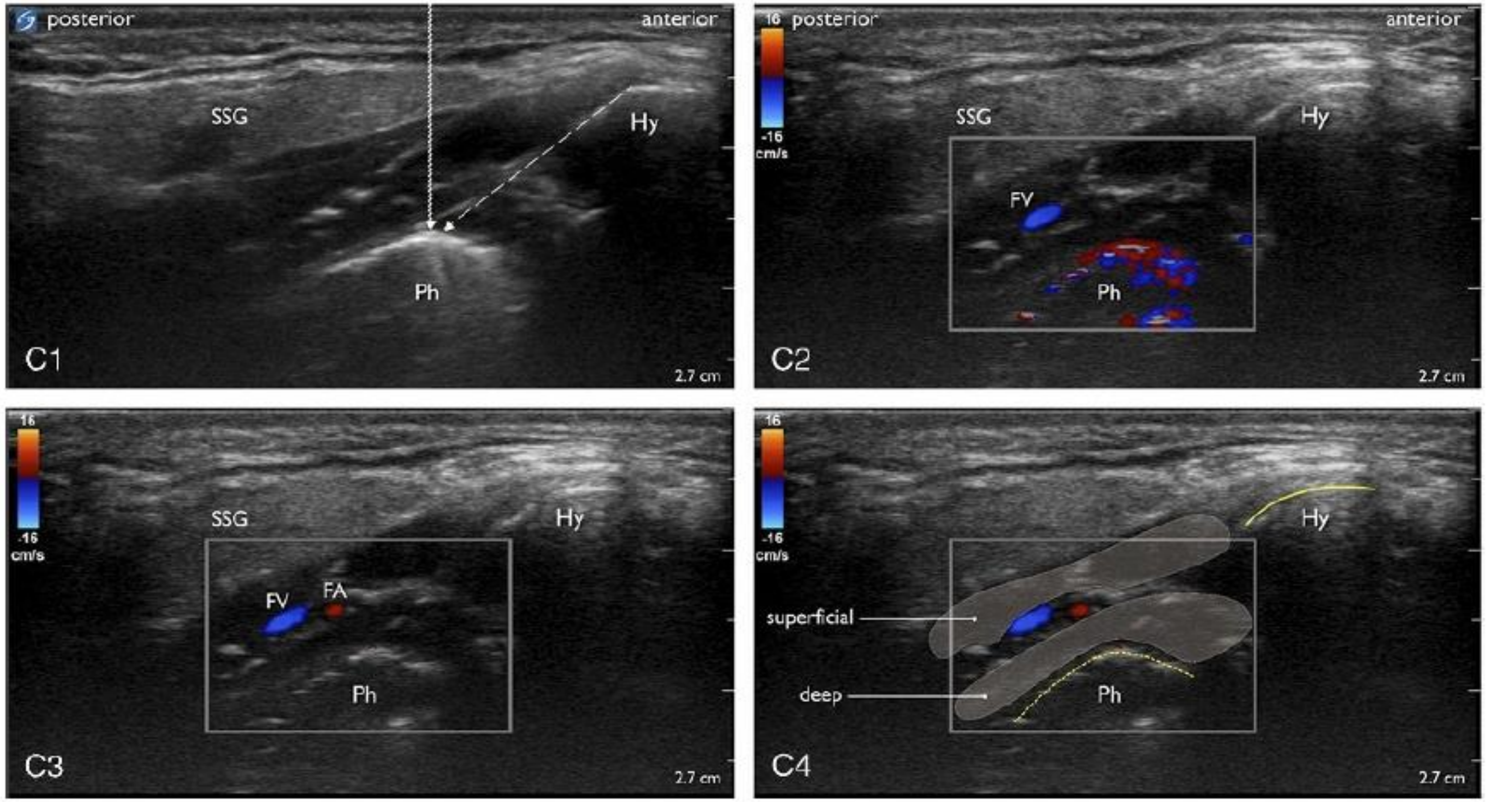


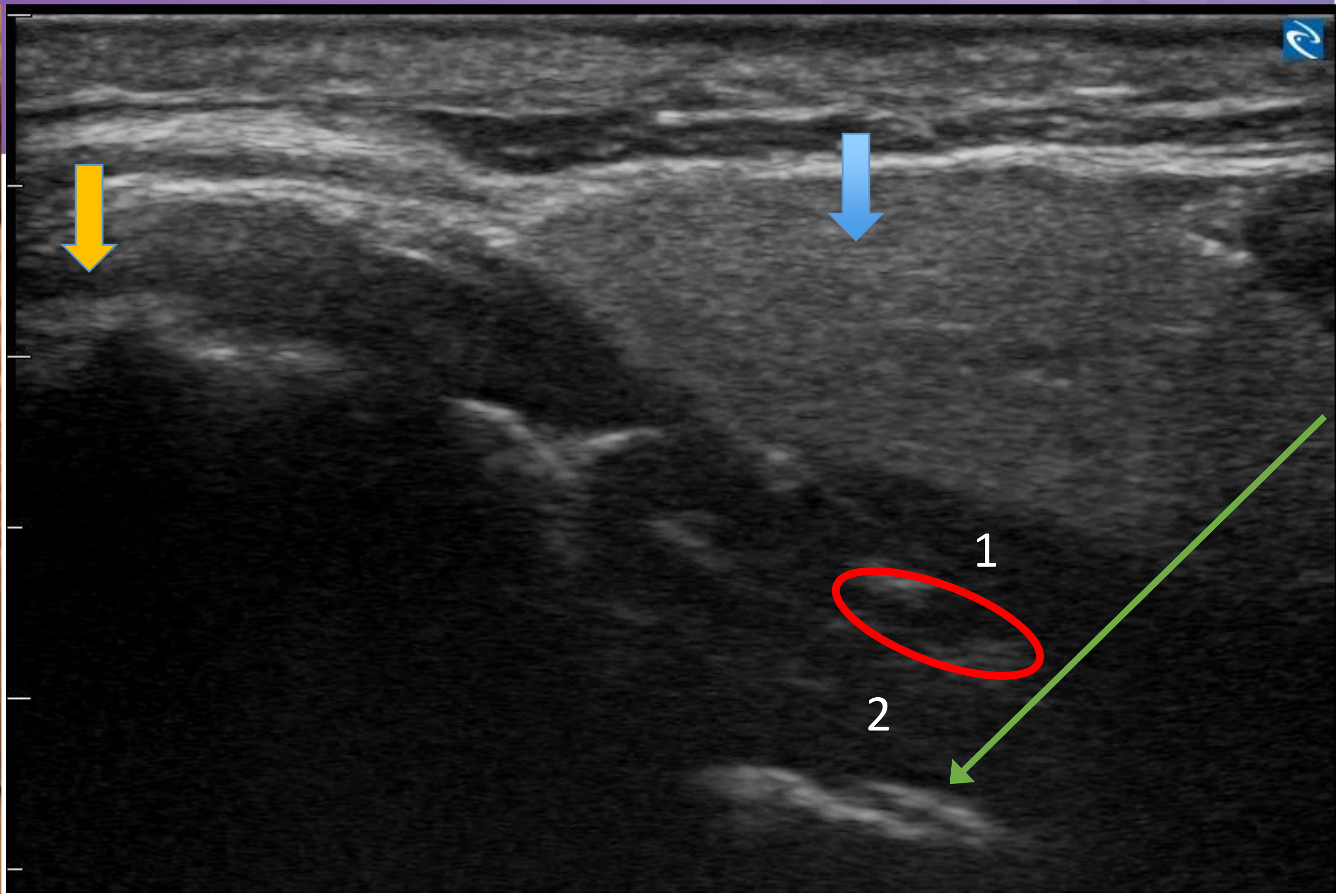
Posterior auricular nerve
Styloid process
Greater auricular nerve
Zygomatic facial
Buccal facial
Glossopharyngeal nerve
Platysma muscle

Ultrasound-Guided Glossopharyngeal Nerve Block
A Cadaver and a Volunteer Sonoanatomy Study

Josip Ažman, MD, PhD, DESA, EDRA,† Tatjana Stopar Pintaric, MD, PhD, DEAA,‡§*
Erika Cvetko, DMD, PhD,§ and Kamen Vlassakov, MD||

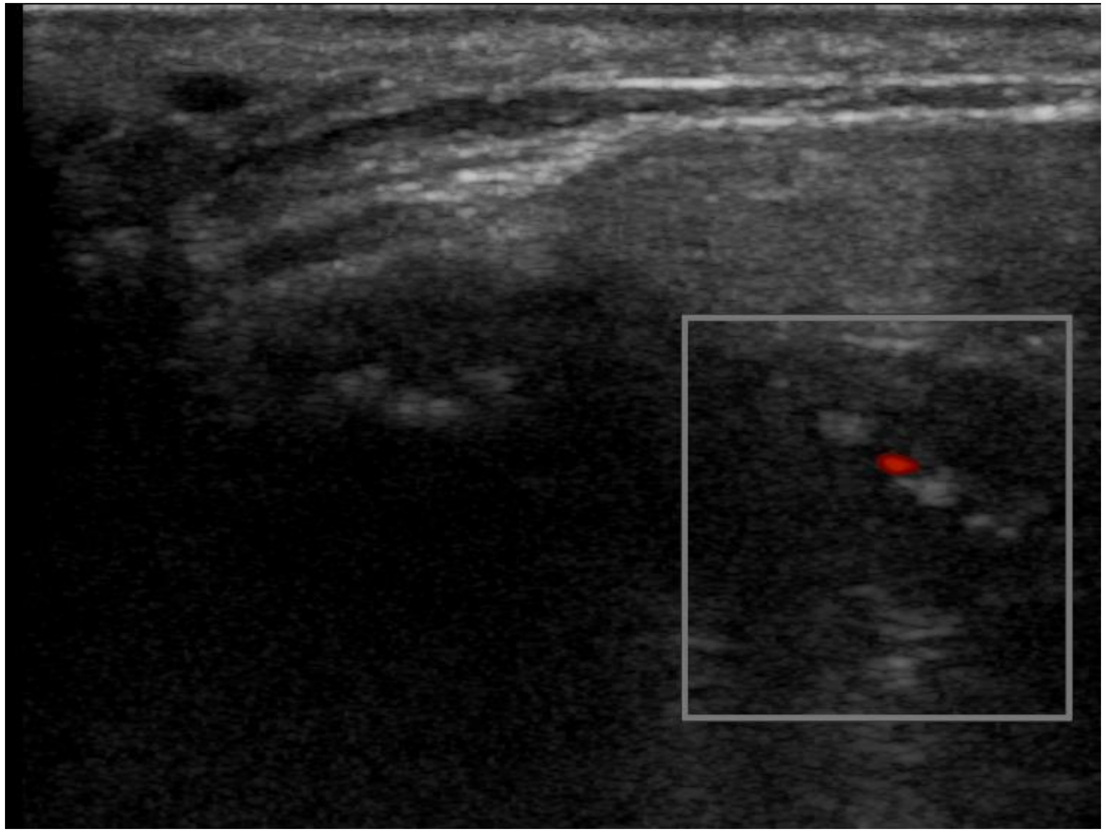
(*Reg Anesth Pain Med* 2017;42: 252–258)

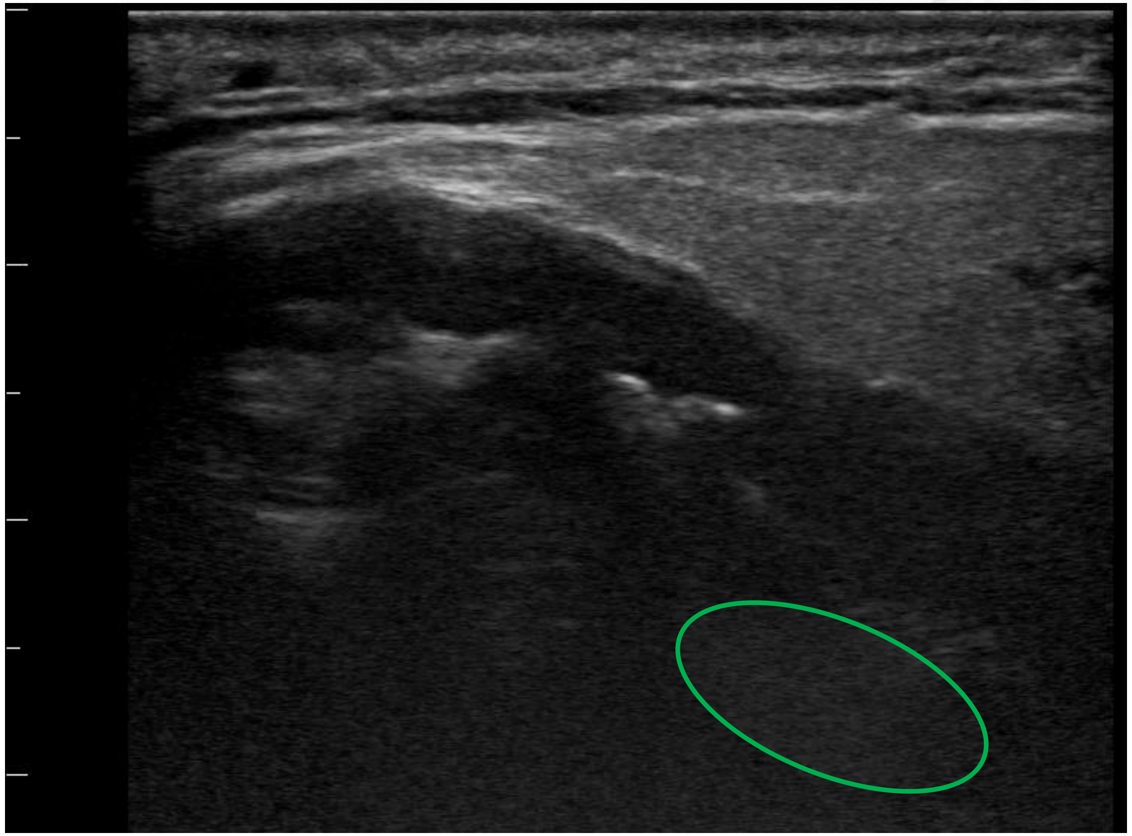




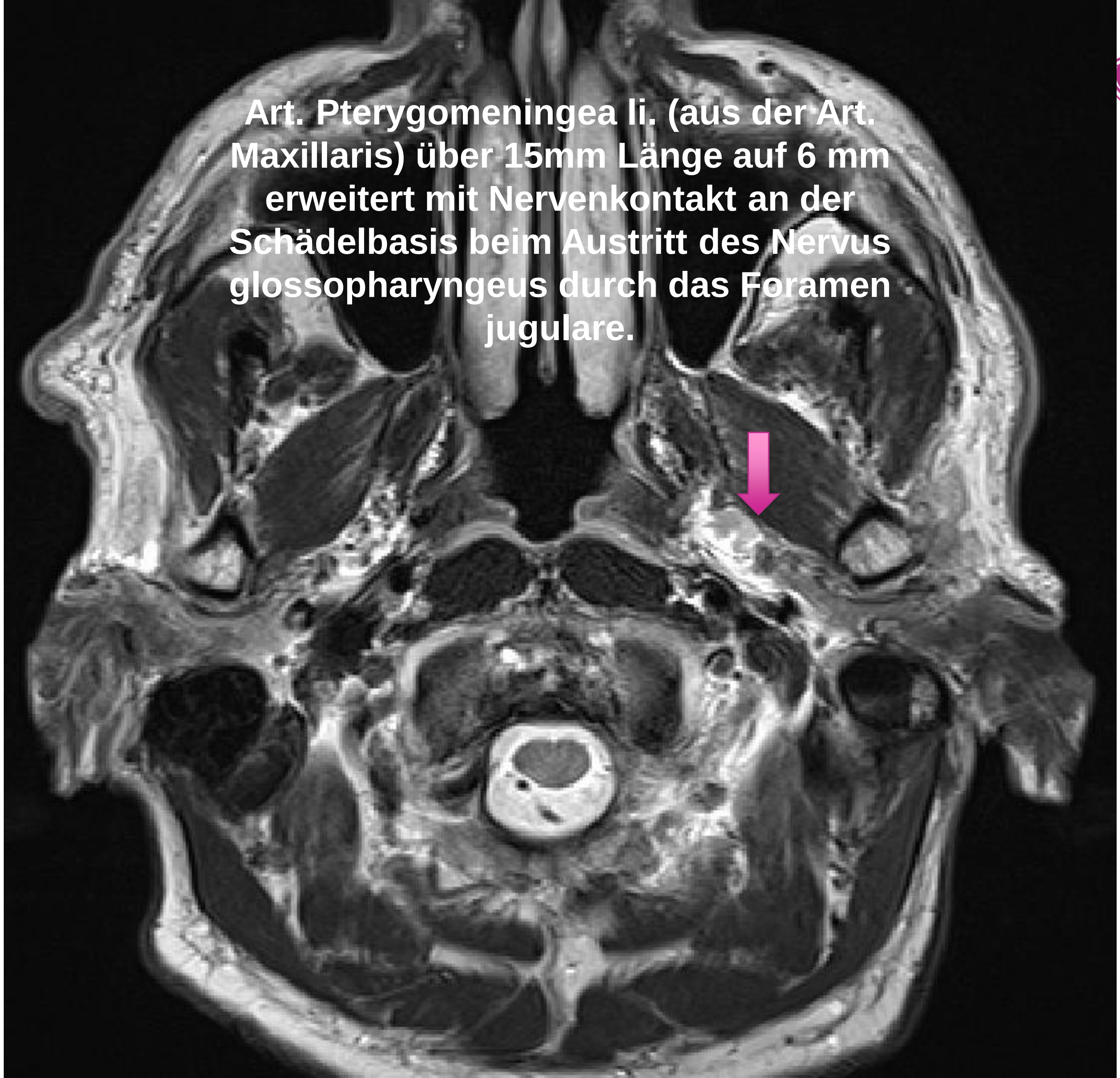
- 1 Stylohyoid- , Digastric-M.
- 2 Styloglossus- , Hyoglossus-M.

G25, Mepivacaine 1% 3ml: no pain for several hours





e-ESRA

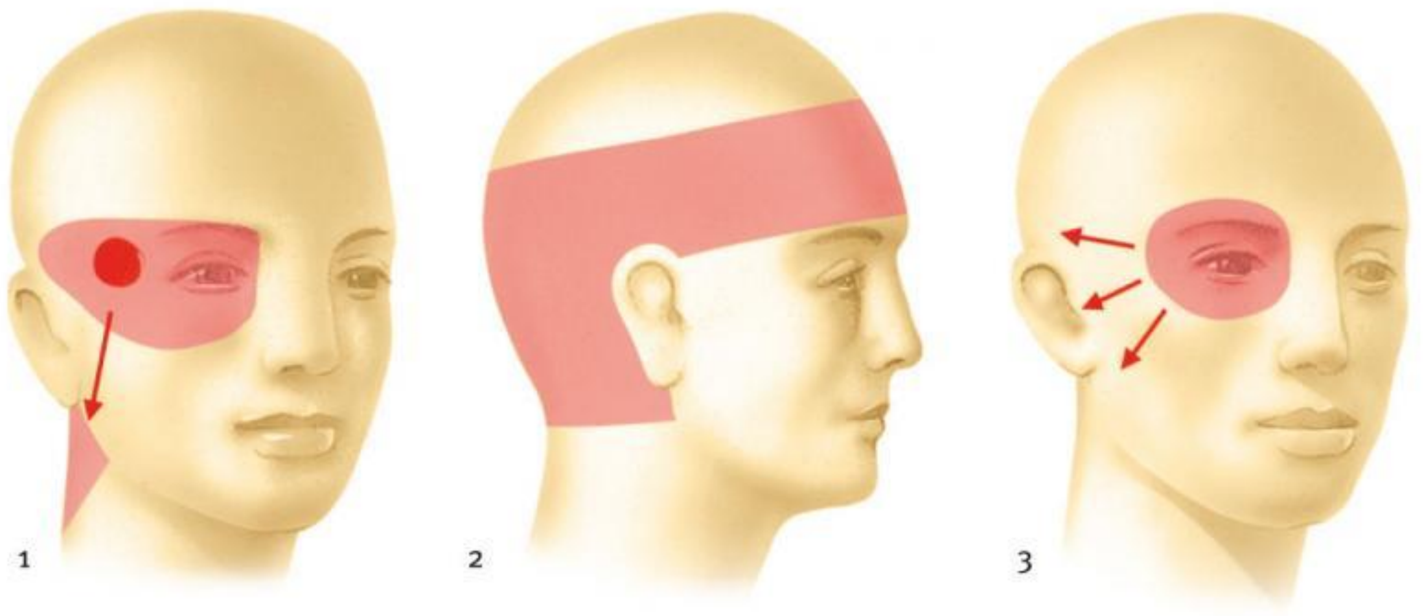


Herz-Jesu Krankenhaus Wien

Volkskrankheit Kopfschmerzen

Prävalenz weltweit > 60%, 4% der Menschen an mehr als 15d/ Mo

Herz-Jesu
Krankenhaus Wien



	Migräne (1)	Spannungskopfschmerzen (2)	Cluster-Kopfschmerz (3)
Charak-teristik	pulsierend, pochend	dumpf, drückend, »Schraubstockgefühl«	unerträglich stechend, bohrend
Dauer/ Zeitpunkt	4–72 Stunden morgens	12–16 Stunden tagsüber	30–120 Minuten nachts
Ursache	Gefäßverengung und -erweiterung, Sauerstoffmangel	Verspannungen der Muskeln und der Halswirbelsäule; Gefäßkrämpfe	Gefäßerweiterung; typischerweise nach Alkoholgenuss
Begleit-symptome	Übelkeit, Erbrechen, Lichtempfindlichkeit, evtl. Sehstörungen	Schlafstörungen, diffuser Schwindel	hängendes Augenlid, Pupillenverengung, Au-genrötung, Tränenfluss

International Headache Society (IHS): Über 200 KS-Formen in 14 Hauptgruppen

1. Primäre Kopfschmerzen (KS) nach ICHD-3 (auszugsweise)

- Migraine (mit oder ohne Aura) akut + Migraine chronisch
- KS vom Spannungstyp
- Trigemino-autonome KS-Erkrankungen (TAK)
  - Clusterkopfschmerz
  - Paroxysmale Hemikranie, Hemicrania continua
  - Short-lasting unilateral neuralgiform headache attacks
    - Short-lasting unilateral neuralgiform headache attacks with conjunctival injection and tearing (SUNCT-Syndrom)
    - Short-lasting unilateral neuralgiform headache attacks with cranial autonomic symptoms (SUNASyndrom)
- Andere primäre KS (hustenbedingt, kältebedingt, Münzkopfschmerz, neu aufgetretener täglicher anhaltender KS, …)

2. Sekundäre Kopfschmerzen (KS) nach ICHD-3 (auszugsweise)

- KS zurückzuführen auf eine Verletzung oder ein Trauma des Kopfes und/oder der HWS
  - Nach HWS-Beschleunigungstrauma („Peitschenschlag-Syndrom)
  - Nach Kraniotomie
- KS zurückzuführen auf Gefäßstörungen im Bereich des Kopfes und/oder des Halses
  - Arteriitis temporalis
- KS zurückzuführen auf nichtvaskuläre intrakranielle Störungen
  - Hirntumor
  - Postpunktioneller KS
- KS zurückzuführen auf eine Substanz oder deren Entzug (z.B. Medikamentenübergebrauch)
- KS zurückzuführen auf eine Infektion (z.B. Meningitis)
- KS zurückzuführen auf eine Störung der Homöostase (z.B. Hypoxie, Hypertonie)
- Kopf- oder Gesichtsschmerz zurückzuführen auf Erkrankungen des Schädels sowie von Hals, Augen, Ohren, Nase, Nebenhöhlen, Zähnen, Mund oder anderen Gesichts- oder Schädelstrukturen
  - Zervikogener KS
- Kopfschmerz zurückzuführen auf psychiatrische Störungen

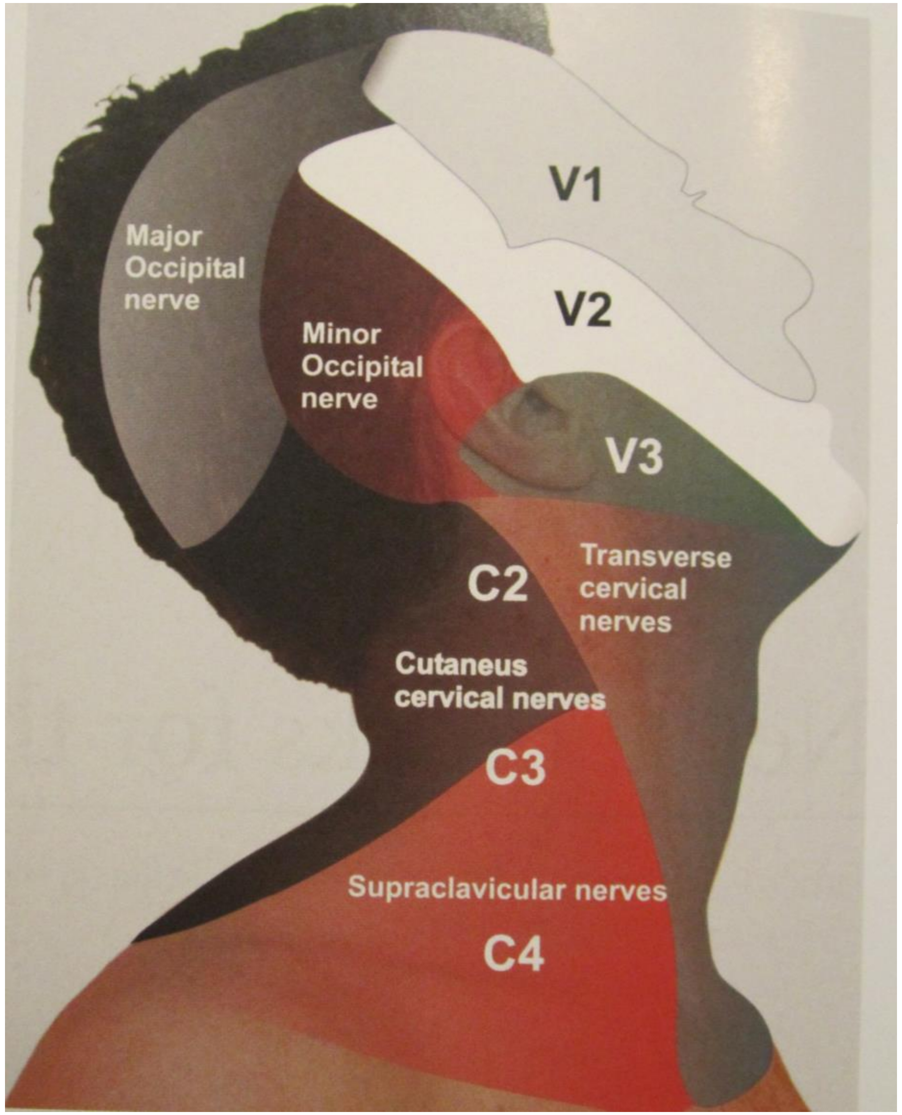
Herz-Jesu Krankenhaus Wien

3. Kranielle Neuralgien und andere Gesichts- und Kopfschmerzen nach ICHD-3 (auszugsweise)

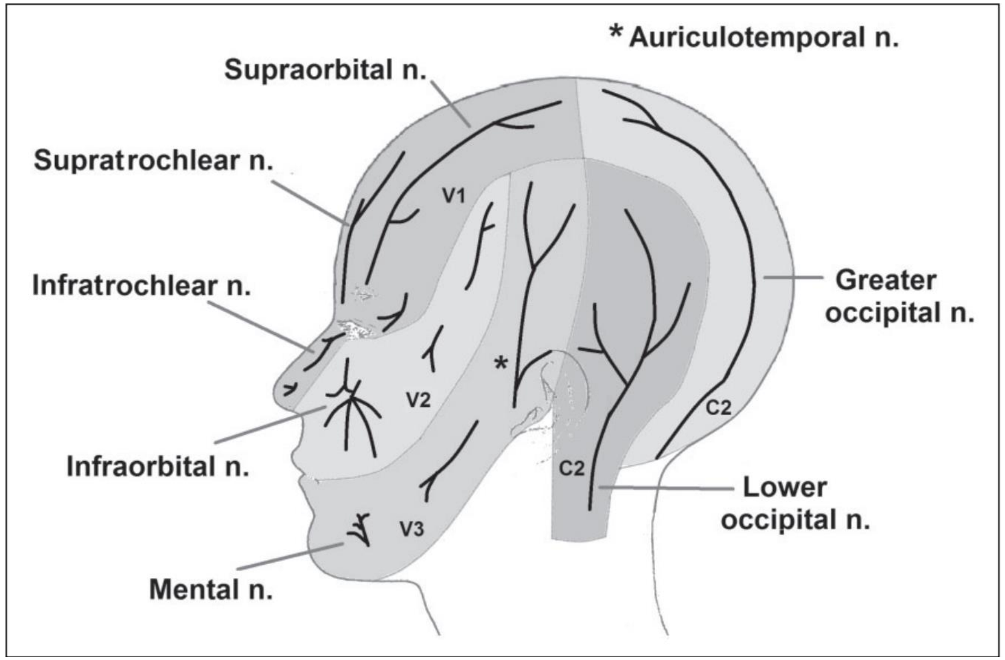
- Schmerzhafte Läsionen der Hirnnerven und andere Gesichtsschmerzen
  - Trigeminusneuralgie, -neuropathie auch durch Herpes Zoster
  - Glossopharyngeusneuralgie, -neuropathie
  - Intermediusneuralgie, -neuropathie
  - Okzipitalisneuralgie
  - Tolosa-Hunt-Syndrom (Ophthalmoplegia dolorosa)
  - Anhaltender idiopathischer Gesichtsschmerz (PIFP)

- Andere KS-Erkrankungen
  - KS nicht anderwärtig klassifiziert
  - KS nicht spezifiziert

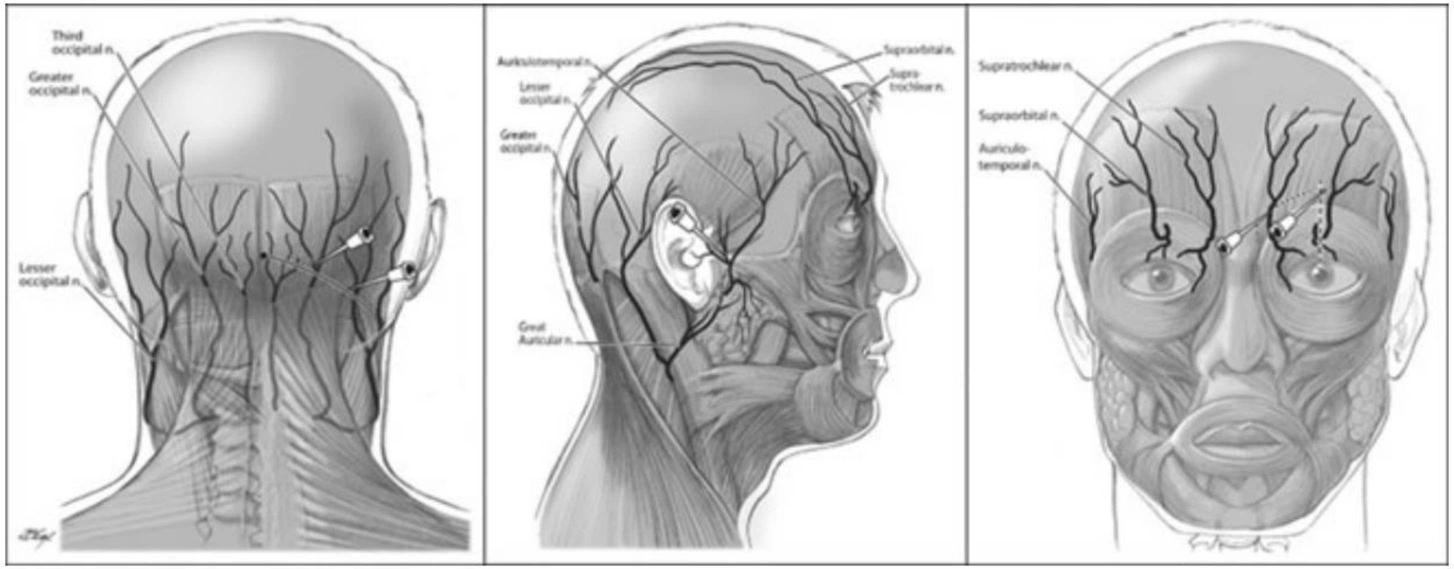
Internationale Klassifikation orofazialer Schmerzen (ICOP), 1. Auflage, Schmerz 2021



V1
V2
V3
Major Occipital nerve
Minor Occipital nerve
C2
Transverse cervical nerves
Cutaneus cervical nerves
C3
Supraclavicular nerves
C4

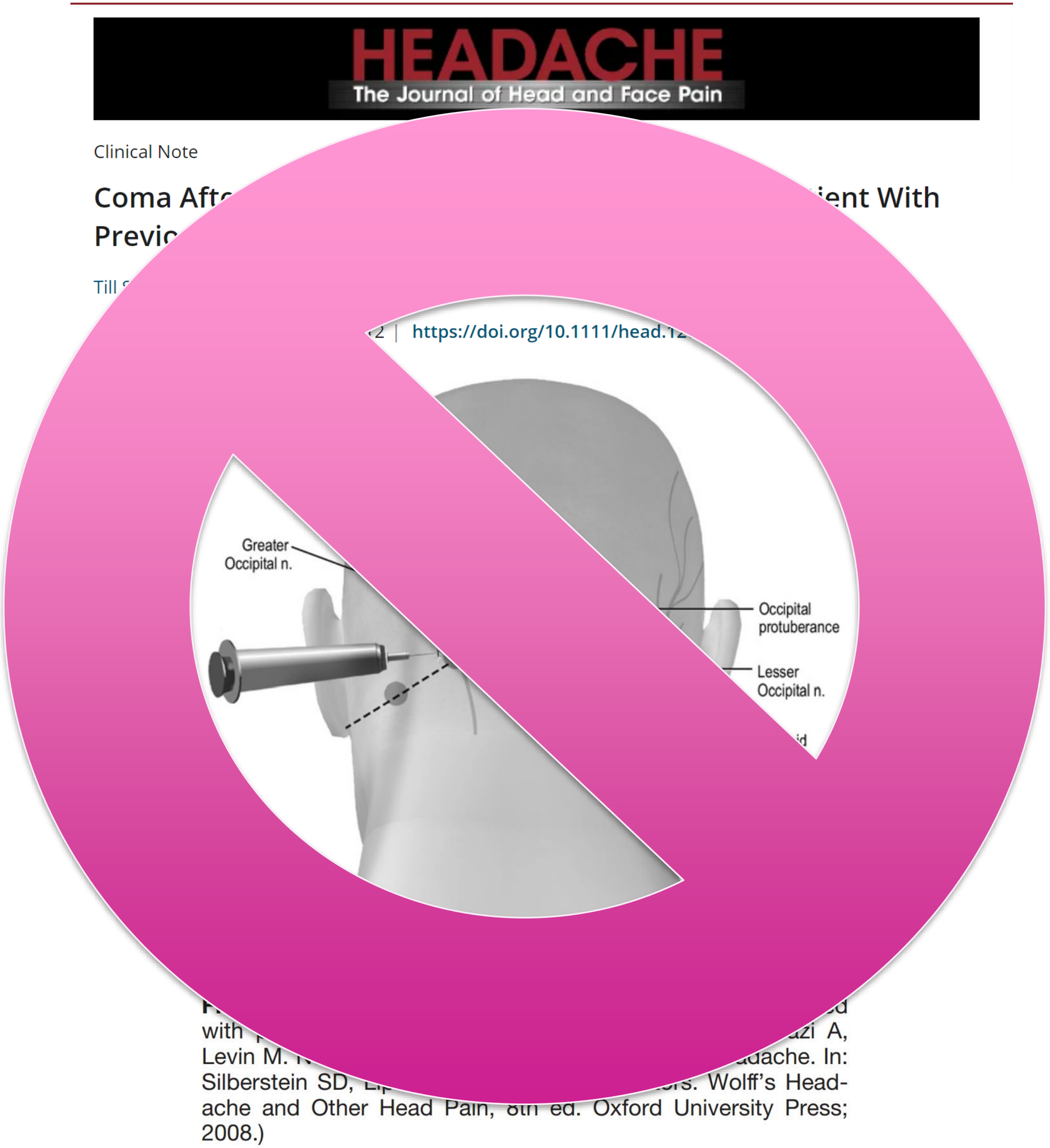


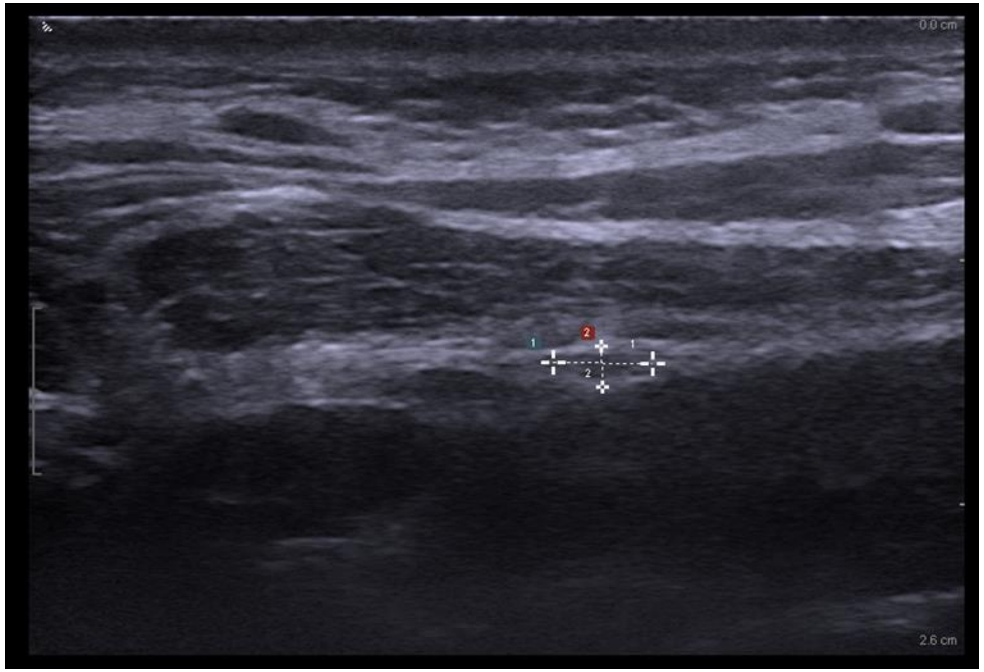
* Auriculotemporal n.
Supraorbital n.
Supratrochlear n.
Infratrochlear n.
Infraorbital n.
Mental n.
Greater occipital n.
Lower occipital n.
V1
V2
V3
C2
*



Third occipital n.
Greater occipital n.
Lesser occipital n.
Auriculotemporal n.
Lesser occipital n.
Greater occipital n.
Great Auricular n.
Supraorbital n.
Supra-trochlear n.
Supratrochlear n.
Supraorbital n.
Auriculo-temporal n.

Vorteile
Ultraschall-gezielter Verfahren

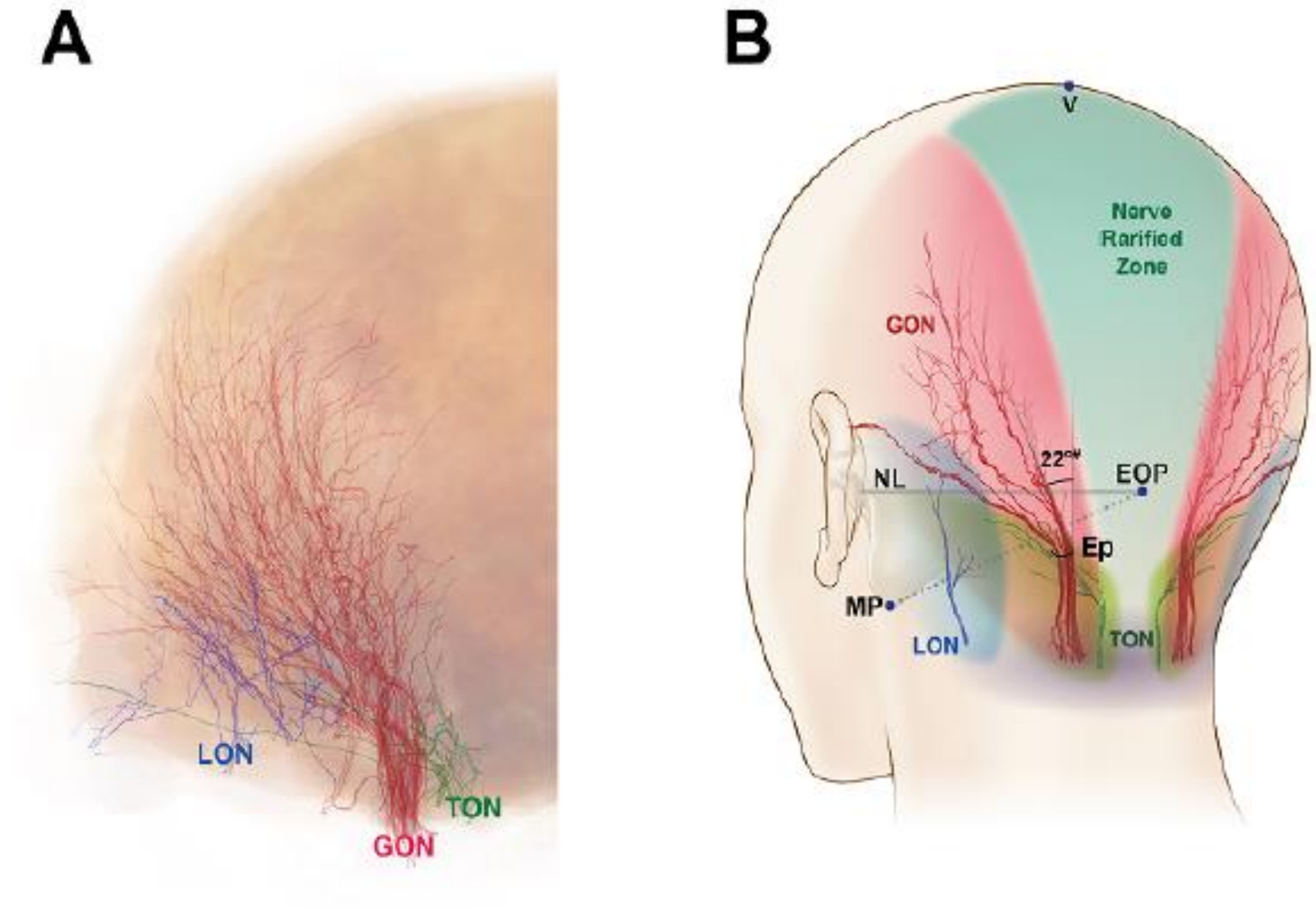





0
1
2
2.9 cm
CINE
84
L12-3
Nerve
MI: 1.5 TIS: 0.1
Secma
2D: G: 71
Res DR: 0
MB
THI

Nervus occipitalis major GON (und minor LON)

Journal of Pain Research 2018:11 2023–2031

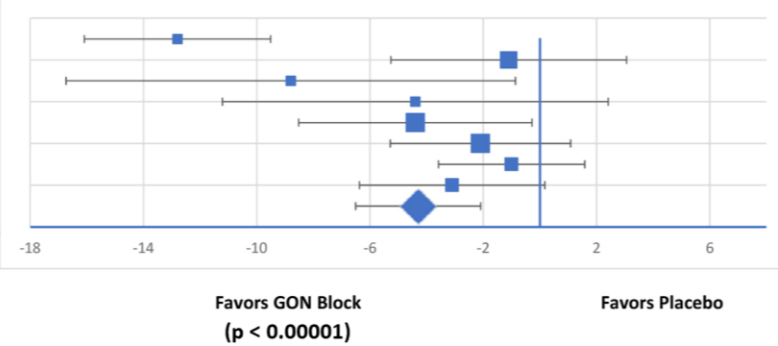


Meta-Analyse: GON-Block bei chronischer Migraine
Shauly, Plast Reconstr Surgery 2019; n=417

Herz-Jesu
Krankenhaus Wien

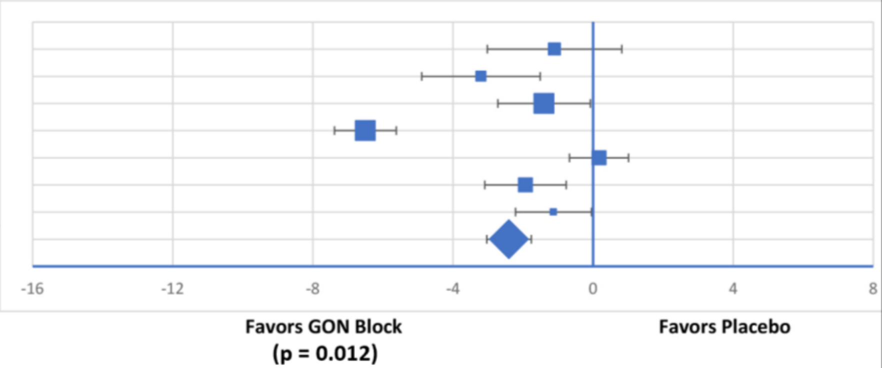
Pooled mean difference of -3.6 monthly headache days (95% CI = -1.39 - -5.81).

Weight	Mean Difference (95% CI)	
11%	-12.8	(-16.09 - -9.51)
15%	-1.1	(-5.26 - 3.06)
9%	-8.8	(-16.74 - -0.86)
9%	-4.4	(-11.21 - 2.41)
17%	-4.4	(-8.52 - -0.28)
17%	-2.1	(-5.29 - 1.09)
12%	-1	(-3.58 - 1.58)
11%	-3.1	(-6.37 - 0.17)
100%	**-4.3**	**(-6.51 - -2.09)**



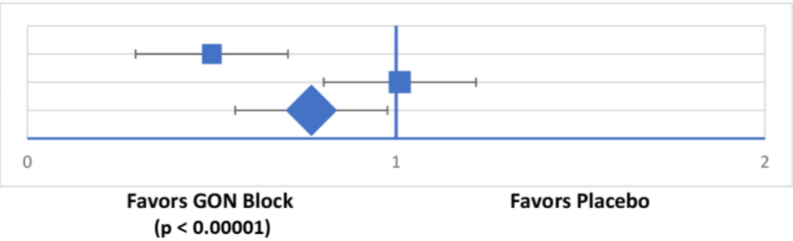
Pooled mean difference of -2.2 VAS pain scores; scale of 0-10 (95% CI = -1.56 - -2.84).

Weight	Mean Difference (95% CI)	
13%	-1.1	(-3.02 - 0.82)
11%	-3.2	(-4.89 - -1.51)
21%	-1.4	(-2.72 - -0.08)
21%	-6.5	(-7.38 - -5.62)
14%	0.2	(-1.04 - 0.64)
14%	-1.9	(-3.06 - -0.74)
7%	-1.1	(-2.18 - -0.02)
100%	**-2.4**	**(-3.04 - -1.66)**



Average risk ratio was found to be 0.76 in the 50% reduction of headache frequency in favor of GON blockade.

Risk Ratio (95% CI)		Weight
0.50	(0.39 - 0.61)	48%
1.01	(0.71 - 1.31)	52%
0.77	**(0.56 - 0.96)**	**100%**



GON block was found to significantly reduce pain intensity and frequency of migraine headaches in patients that experience chronic migraines.

GON block should be recommended for prophylactic use in chronic migraine patients.

REVIEW

Consensus recommendations for anaesthetic peripheral nerve block☆

Neurologia 2017

Herz-Jesu Krankenhaus Wien

S. Santos Lasaosa[a,*], M.L. Cuadrado Pérez[b], A.L. Guerrero Peral[c], M. Huerta Villanueva[d], J. Porta-Etessam[b], P. Pozo-Rosich[e], J.A. Pareja[f]

Table 1 Anaesthetic block for migraine.

Indications	Level of evidence and grade of recommendation	Nerves treated with blockade	Type of study	Authors
CM prevention	Level II of evidence Grade B of recommendation	GON, SON	Prospective, open study, *n* = 60; single intervention, assessment at 3 months	Ruiz Piñero et al.[7], 2015
		GON	Prospective, blinded study, *n* = 84; blockades administered weekly for 4 weeks, monthly for 2 months	Inan et al.[8], 2015
EM prevention	Level IV of evidence GECSEN grade of recommendation	GON	Prospective, blinded study, *n* = 37; blockades administered monthly for 2 months, assessment after 2 months	Piovesan et al.[6], 2001
Symptomatic treatment	Level IV of evidence GECSEN grade of recommendation	GON	Case series	Young et al.[13], 2004 Ashkenazi et al.[14], 2005 Young et al.[15], 2008 Rozen[16], 2007 Baron et al.[17], 2010 Casas-Limón et al.[18], 2015

Levels of evidence and grades of recommendation.
GECSEN: study group for headaches, Spanish Society of Neurology (SEN); EM: episodic migraine; CM: chronic migraine; GON: greater occipital nerve; SON: supraorbital nerve.

Table 2 Anaesthetic block for trigeminal autonomic cephalalgias.

Indications	Level of evidence and grade of recommendation	Nerves treated with blockade	Type of study	Authors
CH	Level II of evidence Grade B of recommendation	GON	Case series, *n* = 19 Case series, *n* = 15 Retrospective, *n* = 60 Prospective, open, *n* = 14 Prospective, open, *n* = 83 Prospective, blind, *n* = 23 Prospective, blind, *n* = 83	Afridi et al.[27], 2006 Busch et al.[21], 2007 Gantenbein et al.[23], 2012 Peres et al.[19], 2002 Lambru et al.[24], 2014 Ambrosini et al.[20], 2005 Leroux et al.[22], 2011
HC	Level IV of evidence GECSEN grade of recommendation	GON, SON	Case series	Afridi et al.[27], 2006 Guerrero et al.[26], 2012
SUNCT, PH	Level IV of evidence GECSEN grade of recommendation	GON	Case series	Afridi et al.[27], 2006 Porta-Etessam et al.[28], 2010

Levels of evidence and grades of recommendation.
CH: cluster headache; GECSEN: study group for headaches, Spanish Society of Neurology; HC: hemicrania continua; PH: paroxysmal hemicrania; GON: greater occipital nerve; SON: supraorbital nerve; SUNCT: short-lasting unilateral neuralgiform headache attacks with conjunctival injection and tearing.

Rev Bras Anestesiol. 2016;66(5):445–450

Sociedade Brasileira de Anestesiologia

REVISTA BRASILEIRA DE ANESTESIOLOGIA

Publicação Oficial da Sociedade Brasileira de Anestesiologia
www.sba.com.br

SCIENTIFIC ARTICLE

Bilateral greater occipital nerve block for treatment of post-dural puncture headache after caesarean operations

CrossMark

Esra Uyar Türkyilmaz[a,*], Nuray Camgöz Eryilmaz[a], Nihan Aydin Güzey[a], Özlem Moraloğlu[b]

[a] *Zekai Tahir Burak Womens' Health Training and Research Hospital, Department of Anesthesiology and Reanimation, Ankara, Turkey*
[b] *Zekai Tahir Burak Womens' Health Training and Research Hospital, Department of Obstetrics and Gynecology, Ankara, Turkey*

Received 3 December 2014; accepted 23 March 2015
Available online 21 January 2016

KEYWORDS
Post-dural puncture headache;
Caesarean operations;
GON block

Abstract
Background: Post-dural puncture headache (PDPH) is an important complication of neuroaxial anesthesia and more frequently noted in pregnant women. The pain is described as severe, disturbing and its location is usually fronto-occipital. The conservative treatment of PDPH consists of bed rest, fluid theraphy, analgesics and caffeine. Epidural blood patch is gold standard theraphy but it is an invasive method. The greater occipital nerve (GON) is formed of sensory fibers that originate in the C2 and C3 segments of the spinal cord and it is the main sensory nerve of the occipital region. GON blockage has been used for the treatment of many kinds of headache. The aim of this retrospective study is to present the results of PDPH treated with GON block over 1 year period in our institute.
Methods: 16 patients who had been diagnosed to have PDPH, and performed GON block after caesarean operations were included in the study. GON blocks were performed as the first treatment directly after diagnose of the PDPH with levobupivacaine and dexamethasone.
Results: The mean VAS score of the patients was 8.75 (±0.93) before the block; 3.87 (±1.78) 10 min after the block; 1.18 (±2.04) 2 h after the block and 2.13 (±1.64) 24 h after the block. No adverse effects were observed.
Conclusions: Treatment of PDPH with GON block seems to be a minimal invasive, easy and effective method especially after caesarean operations. A GON block may be considered before the application of a blood patch.

Herz-Jesu Krankenhaus Wien

Open Access

Original Article

Ultrasound-guided bilateral greater occipital nerve block for the treatment of post-dural puncture headache

Fethi Akyol[1], Orhan Binici[2], Ufuk Kuyrukluyildiz[3], Guldane Karabakan[4]

ABSTRACT
Background and Objective: Post-dural puncture headache (PDPH) is one of the complications frequently observed after spinal or epidural anesthesia with dural penetration. For PDPH patients who do not respond to conservative medical treatment, alternative treatments such as bilateral occipital nerve block should be considered.In this study the efficacy of bilateral occipital nerve block was retrospectively evaluated in patients with post-dural puncture headache.
Methods: Ultrasound-guided bilateral occipital nerve block was administrated in 21 patients who developed PDPH after spinal anesthesia, but did not respond to conservative medical treatment within 48 hours between January 2012 and February 2014. The study was conducted at Erzincan University Faculty of Medicine Gazi Mengucek Education and Research Hospital
Results: Mean Visual Analog Scale (VAS) pain scores at 10 minutes and 6, 10, 15 and 24 hours after the block were significantly improved compared to the patients with a pre-block VAS score between 4 and 6 as well as patients with a pre-block VAS score between 7 and 9 ($p<0.01$). After 24 hours of the block applied, VAS pain score dropped to 1 for all 12 patients who had a pre-block VAS score between 4 and 6. Whereas, VAS score decreased to 2 at 24 hours after the block in only one of the patients with a pre-block VAS between 7 and 9. For the patients with a pre-block VAS score between 7 and 9, there was no significant improvement in the mean VAS score 24 hours after the block.
Conclusions: For patients with PDPH and a pre-block VAS score between 4 and 6 who do not respond to conservative medical treatment, an ultrasound-guided bilateral occipital nerve block may be effective.

KEY WORDS: Greater occipital nerve, Post-dural pain headache, Ultrasound.

doi: http://dx.doi.org/10.12669/pjms.311.5759

How to cite this:
Akyol F, Binici O, Kuyrukluyildiz U, Karabakan G. Ultrasound-guided bilateral greater occipital nerve block for the treatment of post-dural puncture headache. Pak J Med Sci 2015;31(1):111-115. doi: http://dx.doi.org/10.12669/pjms.311.5759

Herz-Jesu Krankenhaus Wien

Erfolgreiche Ultraschall-gezielte beidseitige proximale Blockade des Nervus occipitalis major in Rückenlage bei konservativ therapierefraktärem postspinalem Kopfschmerz

Hüsemann M., Huterer S., Martin-Mestre C., Scheck T., Greher M.

Abteilung für Anästhesie, Intensivmedizin und Schmerztherapie, Herz-Jesu Krankenhaus Wien

Hintergrund:

Die Inzidenz postspinaler Kopfschmerzen liegt abhängig von Nadeltyp und -stärke sowie Geschlecht und Alter bei 1% bis 30%. Bei konservativ (Flüssigkeitsgabe, Analgetika, Koffein) therapierefraktären Schmerzen wird häufig ein epiduraler Blutpatch durchgeführt. Dieser hat zwar eine sehr hohe initiale Erfolgsrate, ist jedoch technisch aufwändig und kann potentiell zu epiduralen Blutungen und Infektionen führen.

Erste Fallberichte beschreiben als neue Therapieoption eine beidseitige distale Blockade des Nervus occipitalis major (1).

External occipital

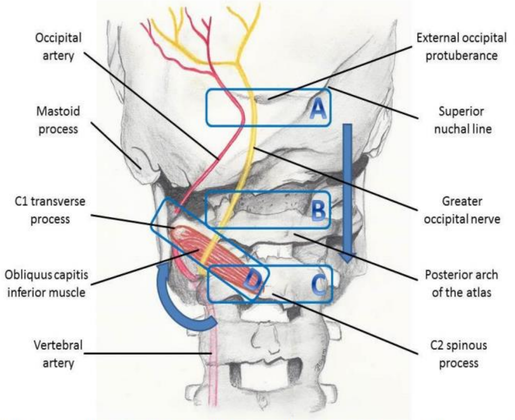


Abb. 1: *Skizzierte Darstellung des Nervenverlaufs mit anatomischen Orientierungspunkten und Schnittebenen.* © M.Greher

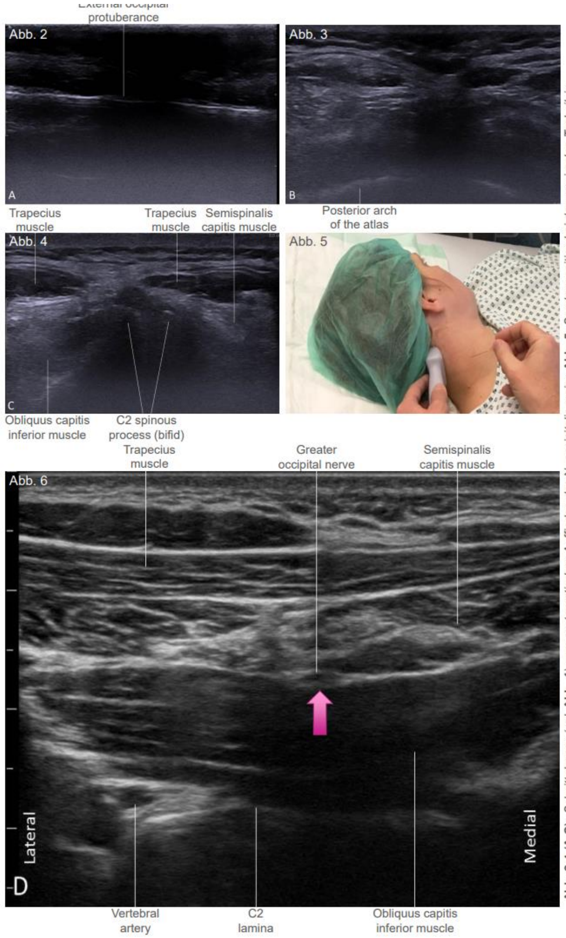


Abb. 2-4 (A-C): *Schnittebenen (vgl.* **Abb. 1***) zum systematischen Auffinden des N. occipitalis major.* **Abb. 5:** *Sondenposition bei der proximalen Technik in Rückenlage mit Kopfdrehung.* **Abb.6 (D):** *Darstellung des N. occipitalis major in proximaler Technik.* © M.Greher

Falldarstellung:

- PatientIn: 33 Jahre, weiblich
- Operation: ventrale Schenkelhalsplastik in Spinalanästhesie
- Am 3. postoperativen Tag Vorstellung mit ausgeprägten, typisch lageabhängigen Kopfschmerzen
- Konservativ therapierefraktär, ausschließlich flache Rückenlage toleriert

- Verwendung der proximalen Technik (2)
- Rückenlage mit Kopfdrehung
- Darstellung des Nervus occipitalis major (Abb.6, Pfeil) mittels Linearschallkopf (Sonosite X-Porte, 15 MHz)
- Blockade mit jeweils 5ml Ropicavain 0,5% / 2mg Dexamethason

➔ Die Patientin war sofort beschwerdefrei und konnte noch am gleichen Tag zufrieden entlassen werden.

Diskussion:

Mit der distalen Technik in Höhe der Linea nuchae fand sich in der retrospektiven Studie an 21 Patienten mit postspinalem Kopfschmerz eine signifikante Besserung bei der Gruppe mit VAS-Ausgangswerten zwischen 4 und 6 (1). Wir konnten 2015 anatomisch zeigen, dass die proximale Methode auf Höhe C2 eine höhere Erfolgsquote hat (2), weshalb im vorliegenden Fall erstmals diese Technik angewandt wurde.

Schlussfolgerung:

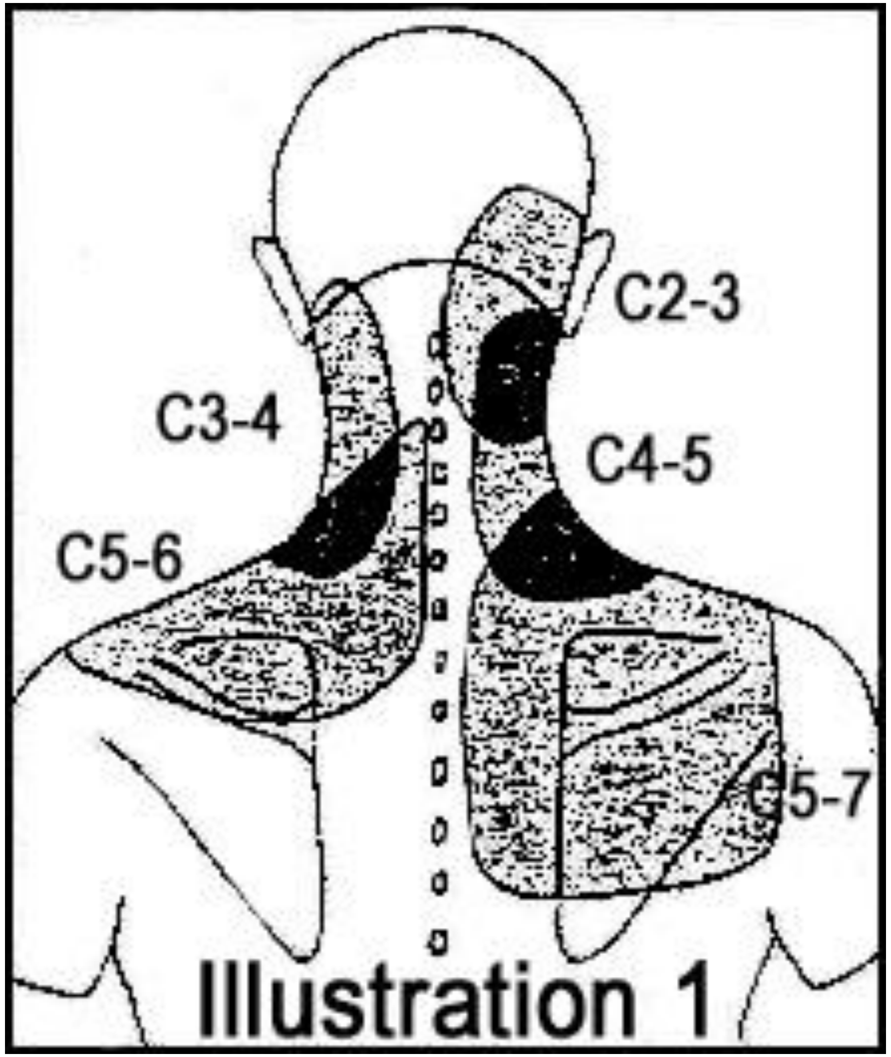
Die Ultraschall-gezielte beidseitige Blockade des Nervus occipitalis major sollte bei konservativ therapierefraktärem postspinalem Kopfschmerz als weniger invasive Therapieoption vor einem epiduralen Blutpatch in Betracht gezogen werden. Die vorteilhaftere proximale Technik auf Höhe C2 ist auch in Rückenlage bei Kopfdrehung gut durchführbar.

References:

1. *Akyol F. et al: Ultrasound-guided bilateral greater occipital nerve block for the treatment of post-dural puncture headache. Pak J Med Sci 2015;31(1):111-15*
2. *Greher M. et al: Sonographic visualization and ultrasound-guided blockade of the greater occipital nerve: a comparison of two selective techniques confirmed by anatomical dissection. Br J Anaesth 2010;104:637-42*

Korrespondenzadresse: Prim. Dr. Manfred Greher, manfred.greher@kh-herzjesu.at

Zervicale Facettennerven inkl. Nervus occipitalis tertius



- „Referred pain“ areas in healthy volunteers after provocation

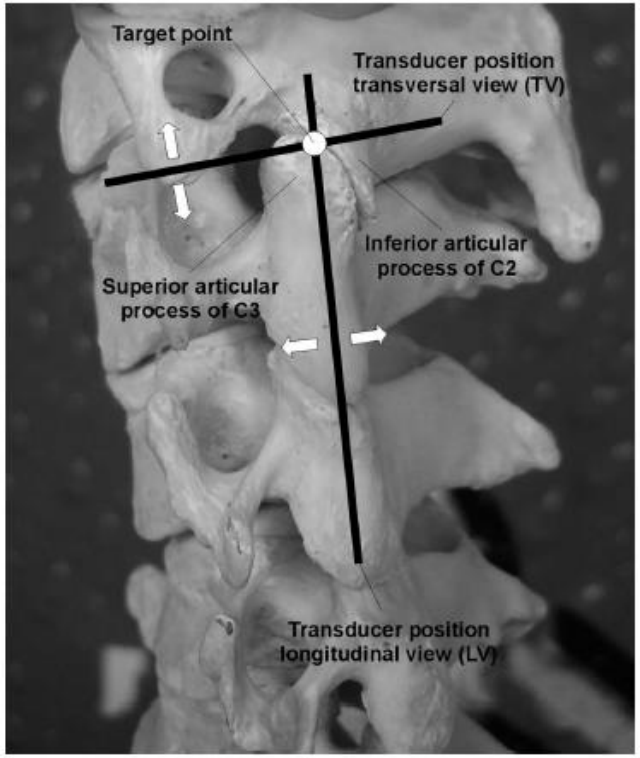
Dwyer et al. Spine 1990

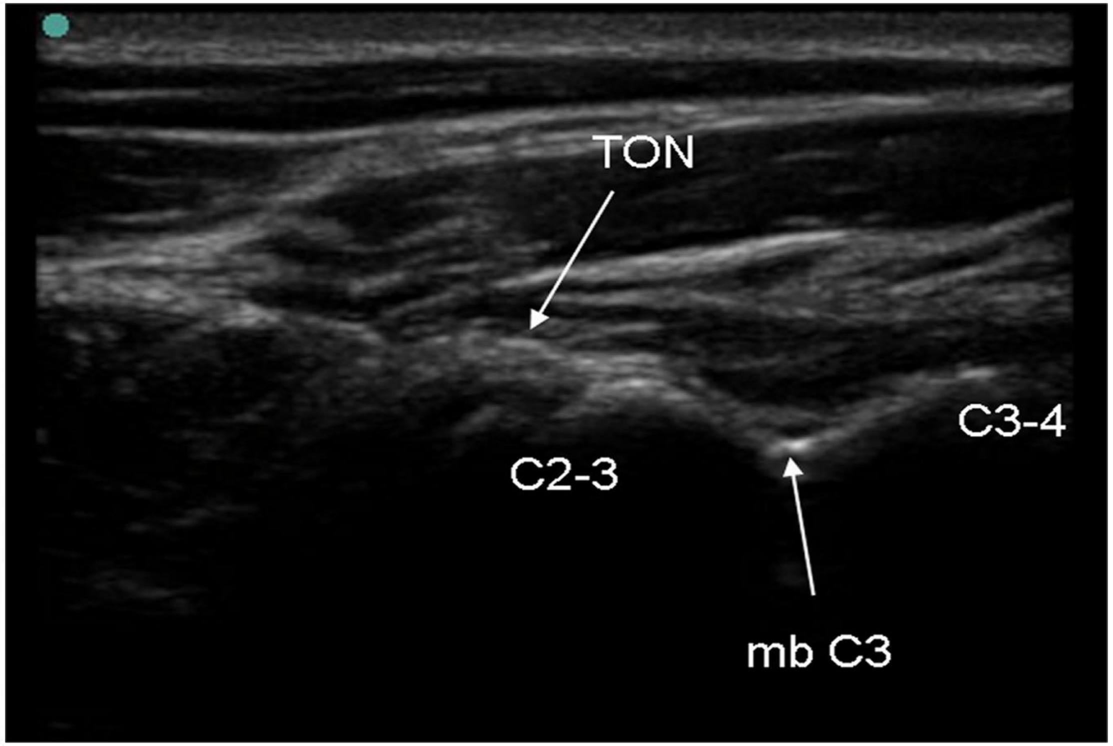
Anesthesiology 2006; 104:303–8

Sonographic Visualization and Ultrasound-guided Block of the Third Occipital Nerve

Prospective for a New Method to Diagnose C2–C3 Zygapophysial Joint Pain

Urs Eichenberger, M.D.,* Manfred Greher, M.D.,† Stephan Kapral, M.D.,‡ Peter Marhofer, M.D.,‡ Roland Wiest, M.D.,§ Luca Remonda, M.D.,|| Nikolai Bogduk, M.D., Ph.D.,# Michele Curatolo, M.D. Ph.D.**





Cervical facet joint derived pain

- **Pain after whiplash injury is common and in up to 50% of cases cervical facet joints are the pain generator**

  Lord et al, Spine 1996

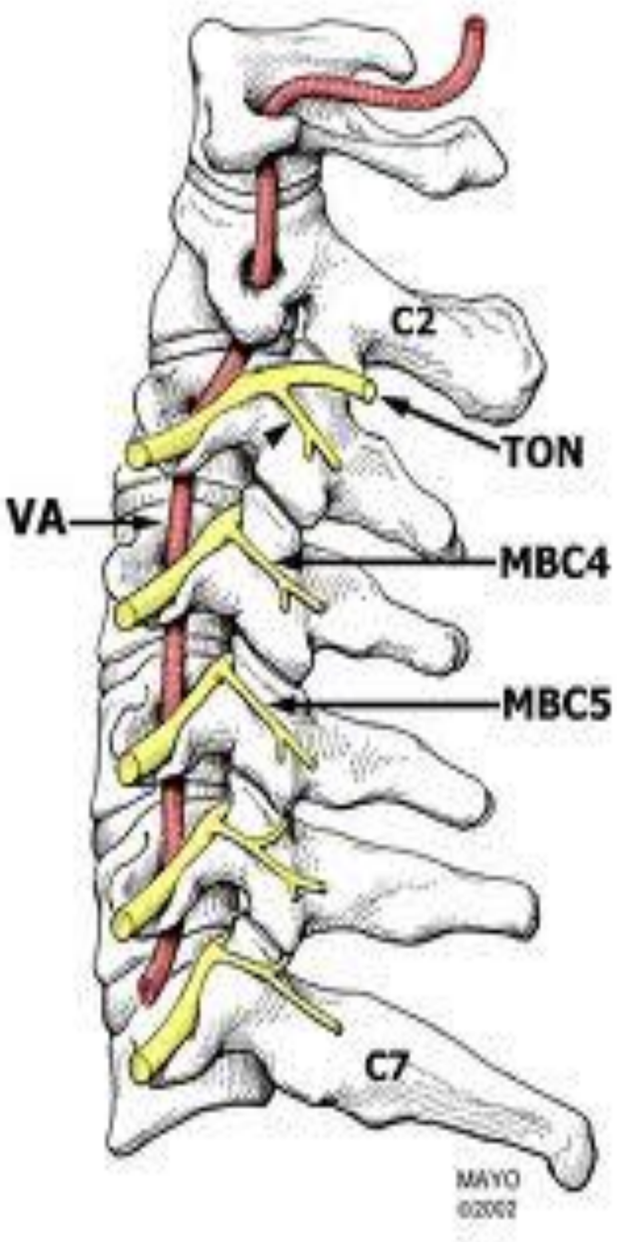
- **The only reliable diagnostic are diagnostic blocks of the nerves innervating the joint (medial branches)**

  Barnsley et al., Pain 1993
  Siegenthaler et al., Anesth Analg 2010

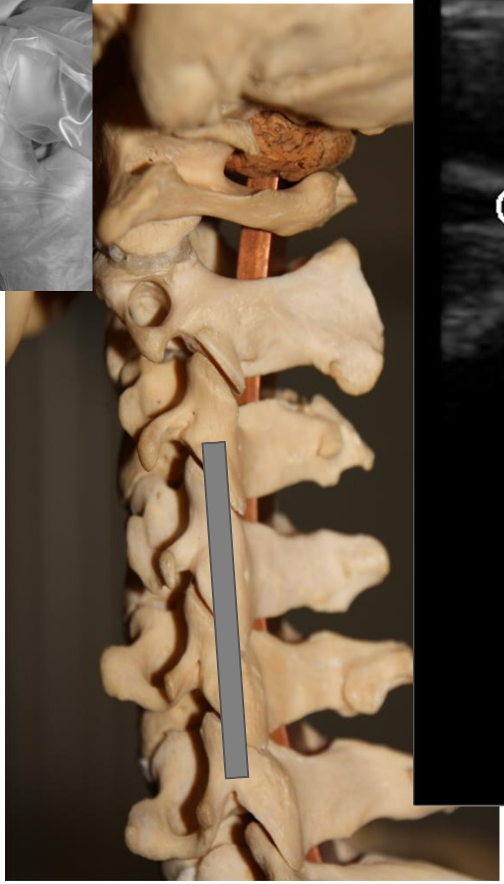
- **After two times positive diagnostic block - there is an evidence based and effective therapy: radio-frequency ablation of the nerves**

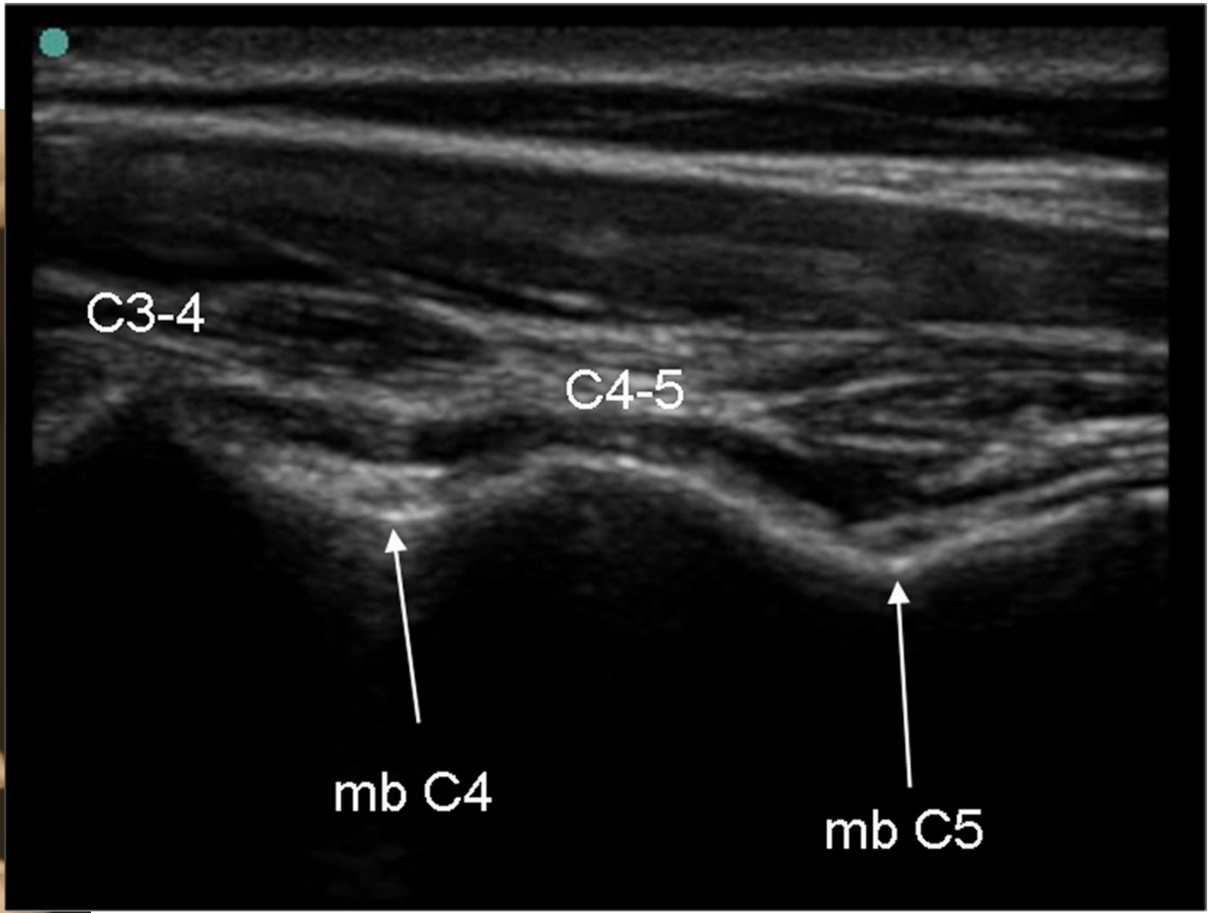
  Lord et al., NEJM 1996

- **Nerve supply: C2/3 is innervated by one single nerve (TON). Other joints by 2 medial branches**



Facettennerven bzw. Medial branches (mb) C4, C5





Sonographically Guided Cervical Facet Nerve and Joint Injections

Why Sonography?

Samer N. Narouze, MD, PhD, David A. Provenzano, MD

Table 1. Summary of Cadaver and Clinical Trials for Sonographically Guided Cervical Facet Injections

Authors	Study Design	Results	Comments
Galiano et al[20]	4 embalmed cadavers; facet injections; 40 sonographic examinations; sonographic measurements compared to CT measurements; 10 procedures performed for needle placement	In 4 sonographic attempts, depiction of joint space not possible; CT and sonographic joint measurements similar; all 10 needles placed into joints	Preclinical study
Obernauer et al[21]	Randomized controlled trial; 40 patients randomized to CT or sonographically guided facet injections	Accuracy of sonographically guided technique 100%; reduced needle repositioning for the sonographically guided technique (0% vs 65%); shorter procedure time for both single and 2-level injections; significantly reduced radiation exposure; no intergroup differences in postprocedure pain relief	C2–3 to C7–T1 facet joints targeted; sonographically guided technique associated with superior outcomes

J Ultrasound Med 2013; 32:1885–1896

Herz-Jesu Krankenhaus Wien

Table 2. Summary of Cadaver and Clinical Trials for Sonographically Guided Cervical Medial Branch Blocks and RF Neurotomy

Authors	Study Design	Results	Comments
Eichenberger et al[10]	14 volunteers; sonographic visualization of 3rd occipital nerve bilaterally; sonographically guided 3rd occipital nerve block; fluoroscopic confirmation	3rd occipital nerve visualized in 27/28 (96% visualization); 23/28 needles placed correctly (82%)	Median 3rd occipital nerve diameter, 2 mm; 3rd occipital nerve blocked in 90%
Siegenthaler et al[26,27]	15 patients with facetogenic pain; sonographic identification of cervical medial branches; shortened fluoroscopically guided RF procedure based on preprocedure sonographic localization of the medial branches	14 patients successfully treated; median time of pain relief, 44 wk	Sonographically guided cervical medial branch block technique described[26]; shortened RF procedure based on sonographic localization of medial branches
Lee et al[28]	5 cadavers; 34 sonographically guided RF neurotomy lesions	Successful lesions in 30/34	RF neurotomy lesions confirmed by pathologic examination
Siegenthaler et al[29]	Exploratory study; 50 patients; diagnostic sonographic examinations performed	3rd occipital nerve successfully visualized in 96%; C7 successfully visualized in 32%	No nerve blocks performed in this study; 3rd occipital nerve to C6 cervical medial branch well visualized
Siegenthaler et al[30]	Sonographically guided cervical medial branch blocks; 60 volunteers; 180 blocks; 0.2 mL of contrast dye injected; fluoroscopic confirmation	180 needles placed; 73 needles purposely misplaced based on study design; 82/107 needles placed correctly (77% accuracy rate); 90/107 contrast dye reached bony target (84% success rate)	Levels tested 3rd occipital nerve to C7 cervical medial branch; no adverse events reported; low accuracy at C7
Finlayson et al[31]	2-phase study; 53 patients; 163 blocks; 0.3 mL of 1:1 local anesthetic and contrast agent injected	Phase 1: 80.9% of needles placed correctly; phase 2: contrast covered appropriate area in 94.5%	Levels investigated C3–C6 medial branches
Finlayson et al[32]	Randomized controlled trial; 40 patients randomized to fluoroscopically or sonographically guided 3rd occipital nerve block	Sonography associated with shorter procedure time (212.8 vs 396.5 s) and fewer needle passes (2 vs 6); no intergroup differences in preblock and postblock pain scores	Sonographically guided technique associated with superior outcomes; vascular breach occurred with fluoroscopically based technique in 10%; 3rd occipital nerve identified in 80% of sonographically guided procedures; no adverse events occurred with the sonographically guided technique

Herz-Jesu
Krankenhaus Wien

Pain Medicine

Pain Medicine 2011; 12: 1703–1709
Wiley Periodicals, Inc.

SPINE SECTION

Original Research Article

A Shortened Radiofrequency Denervation Method for Cervical Zygapophysial Joint Pain Based on Ultrasound Localization of the Nerves

Andreas Siegenthaler, MD, Urs Eichenberger, MD, and Michele Curatolo, MD, PhD

University Department of Anesthesiology and Pain Therapy, University of Bern, Inselspital, Bern, Switzerland

Results. Of the 15 patients, 14 were successfully treated (93%, 95% confidence interval [CI] 80–100%) with a median time of pain relief of 44 weeks. At 6 and 12 months, 13 (87%, 95% CI 70–100%) and 6 patients (40%, 95% CI 15–65%) reported successful treatment, respectively. The median duration of the procedure was 35 minutes.

Herz-Jesu Krankenhaus Wien

2010:
Evidenz für RF der zervikalen Facettennerven!

Cochrane Library

Cochrane Database of Systematic Reviews

The review found that radiofrequency denervation can provide short-term pain relief for a small proportion of people with specific joint problems in the neck. There is conflicting evidence about effects for low-back joint pain, and some evidence that it does not relieve pain from low-back disc problems.

Radiofrequency denervation for neck and back pain (Review)

Niemisto L, Kalso EA, Malmivaara A, Seitsalo S, Hurri H

Hindawi
Pain Research and Management
Volume 2018, Article ID 5480728, 9 pages
https://doi.org/10.1155/2018/5480728

Trigeminusäste inkl. N. auriculotemporalis

Pain Research and Management

Review Article

Ultrasound-Guided Intervention for Treatment of Trigeminal Neuralgia: An Updated Review of Anatomy and Techniques

Abdallah El-Sayed Allam,[1] Adham Aboul Fotouh Khalil,[2] Basma Aly Eltawab,[3] Wei-Ting Wu,[4] and Ke-Vin Chang[4]

[1] *Department of Physical Medicine, Rheumatology and Rehabilitation, Tanta University Hospitals, Faculty of Medicine, Tanta University, Tanta, Egypt*
[2] *New Kasr El-Aini Teaching Hospital, Cairo, Egypt*
[3] *Department of Radiology, Tanta University Hospitals, Tanta, Egypt*
[4] *Department of Physical Medicine and Rehabilitation, National Taiwan University Hospital Bei-Hu Branch, Taipei, Taiwan*

Correspondence should be addressed to Ke-Vin Chang; pattap@pchome.com.tw

Received 4 January 2018; Accepted 15 March 2018; Published 2 April 2018

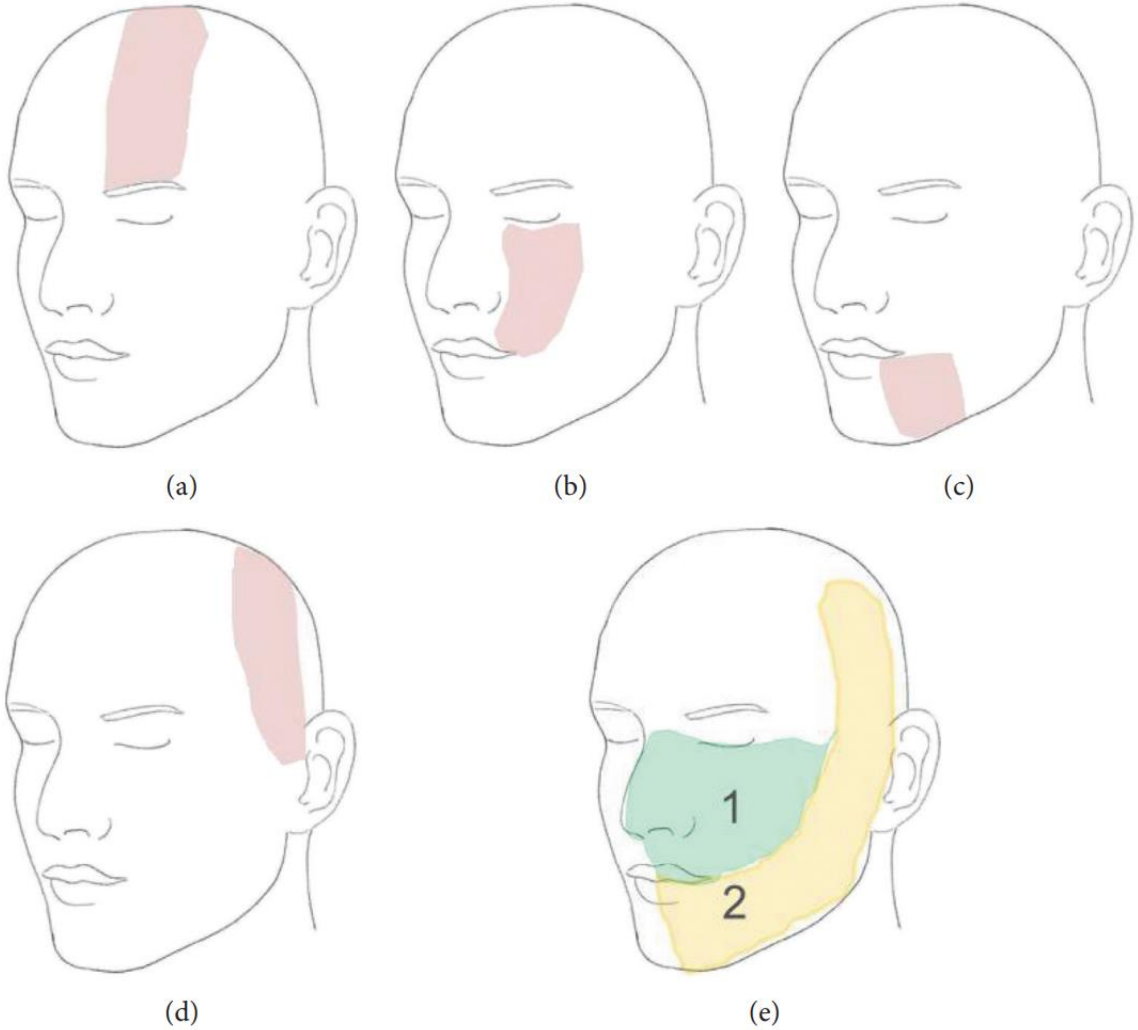
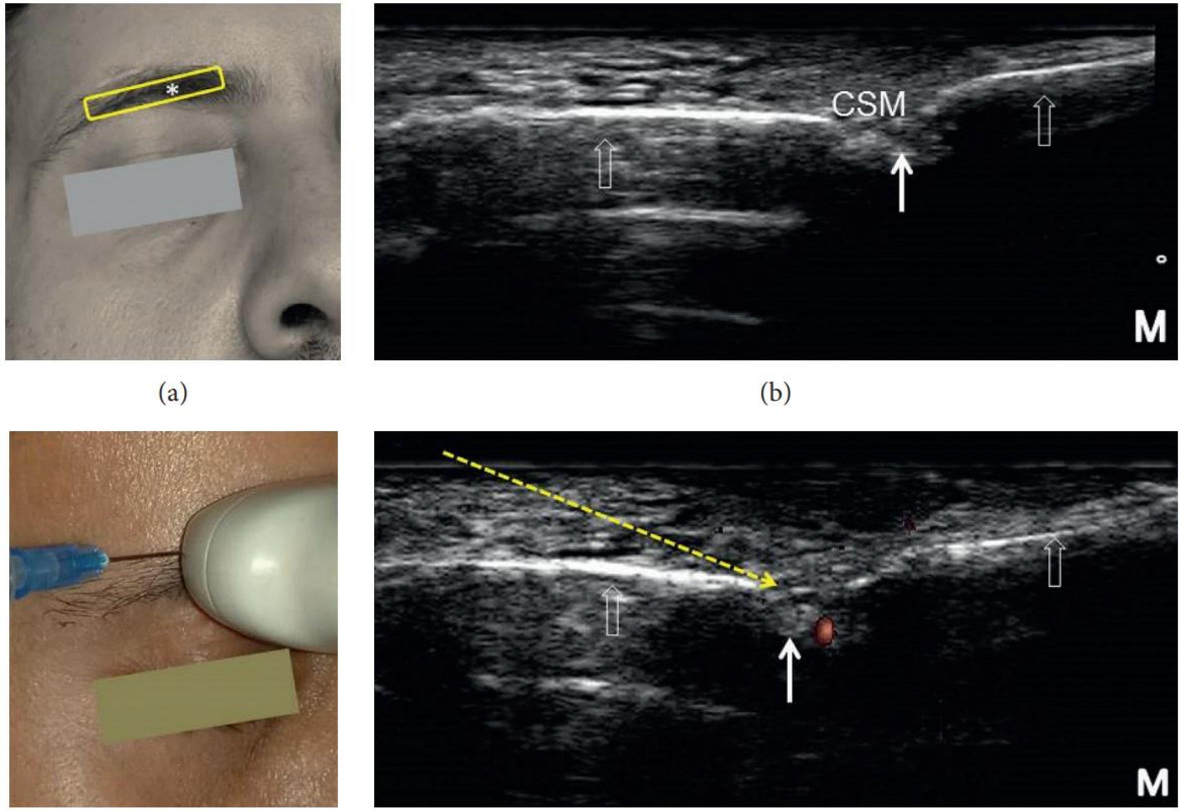


Figure 2: Topography of the sensory distribution of the (a) supraorbital nerve, (b) infraorbital nerve, (c) mental nerve, (d) auriculotemporal nerve, and (e) deep branches of the trigeminal nerve; 1 = area supplied by the maxillary nerve and 2 = area supplied by the mandibular nerve.

N. supraorbitalis, Allam 2018

Herz-Jesu Krankenhaus Wien



(a) (b) (c) (d)

FIGURE 3: Sonoanatomy and ultrasound-guided injection technique for the supraorbital nerve: (a) the position of the transducer (yellow rectangle), (b) ultrasound imaging of the supraorbital nerve emerging from the supraorbital notch, (c) introducing the needle in the lateral-to-medial direction using the in-plane approach to target the supraorbital nerve, and (d) power Doppler image of the supraorbital vessels. The asterisk (*) denotes the supraorbital notch on the face. The empty white arrows denote the supraorbital margin. The solid white arrow denotes the supraorbital nerve. The yellow dashed arrow denotes the needle trajectory. CSM: corrugator supercilii muscle and M: medial side. All the pictures were obtained from the face of the first author.

N. infraorbitalis,
Allam 2018

Herz-Jesu Krankenhaus Wien

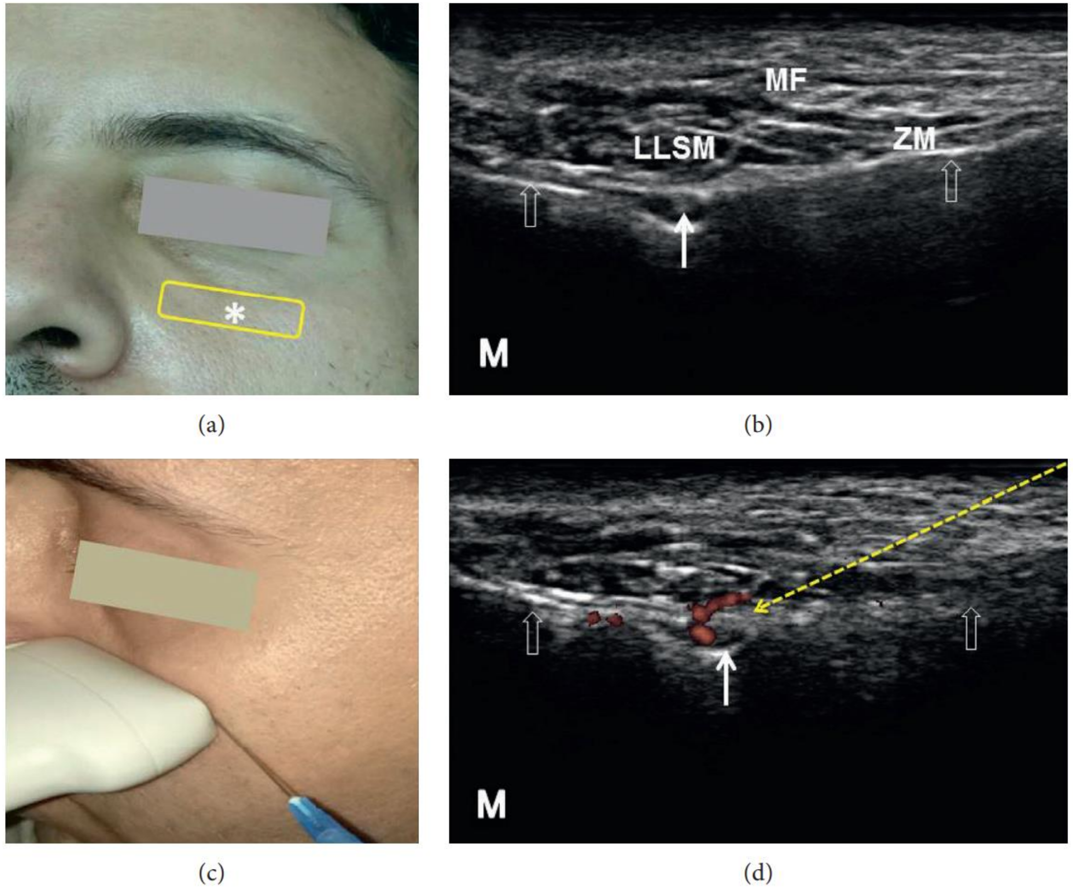
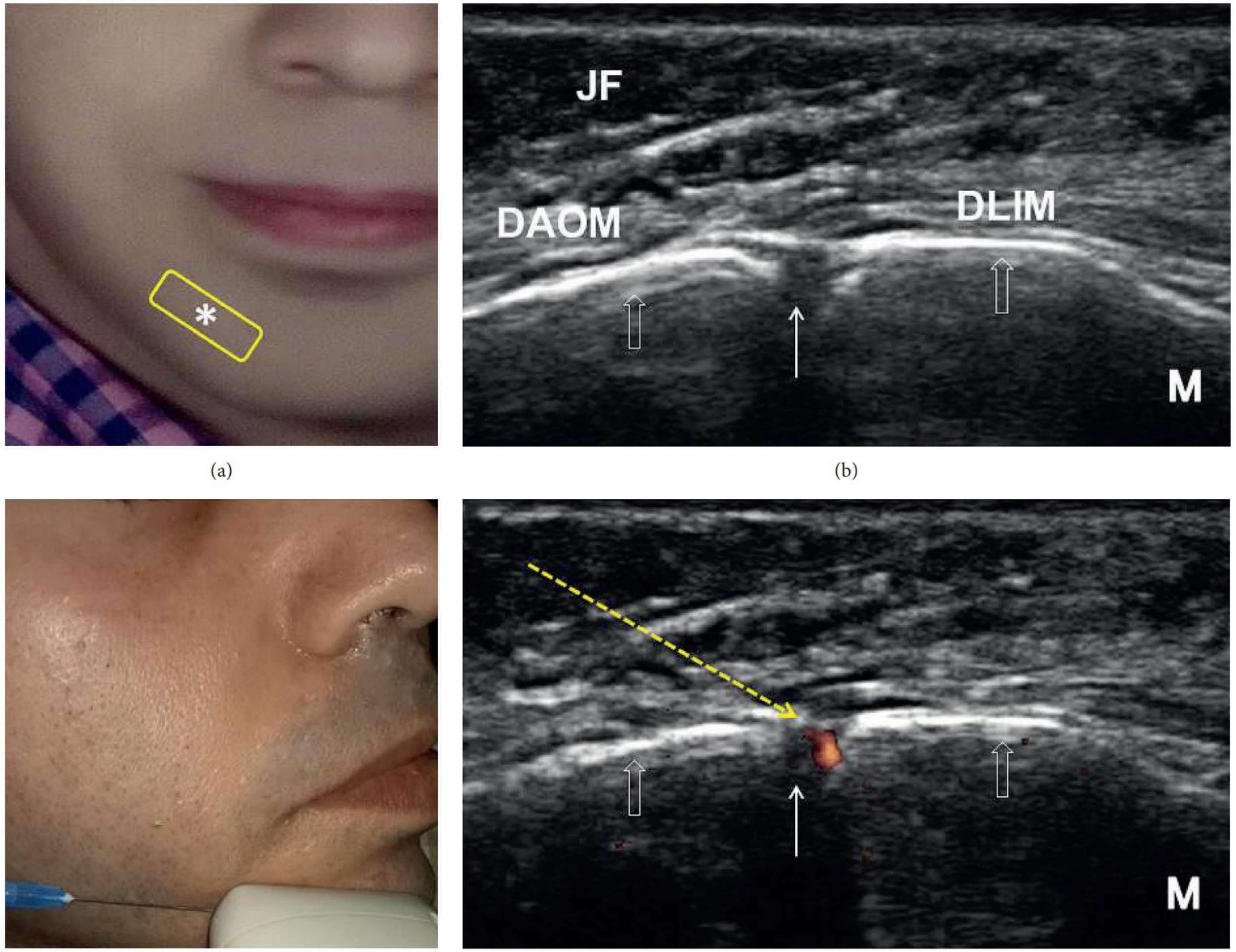


Figure 4: Sonoanatomy and ultrasound-guided injection technique for the infraorbital nerve: (a) the transducer position (yellow rectangle), (b) ultrasound image of the infraorbital nerve (white solid arrow) from the infraorbital foramen, (c) introducing the needle in the lateral-to-medial direction using the in-plane approach to target the infraorbital nerve, and (d) power Doppler image of the infraorbital vessels. The asterisk (*) denotes the infraorbital foramen on the face. The empty white arrows denote the bony cortex of the maxilla. The yellow dashed arrow denotes the needle trajectory. LLSM: levator labii superioris muscle; ZM: zygomaticus minor muscle; MF: malar fat; M: medial side. All the pictures were obtained from the face of the first author.

N. mentalis, Allam 2018

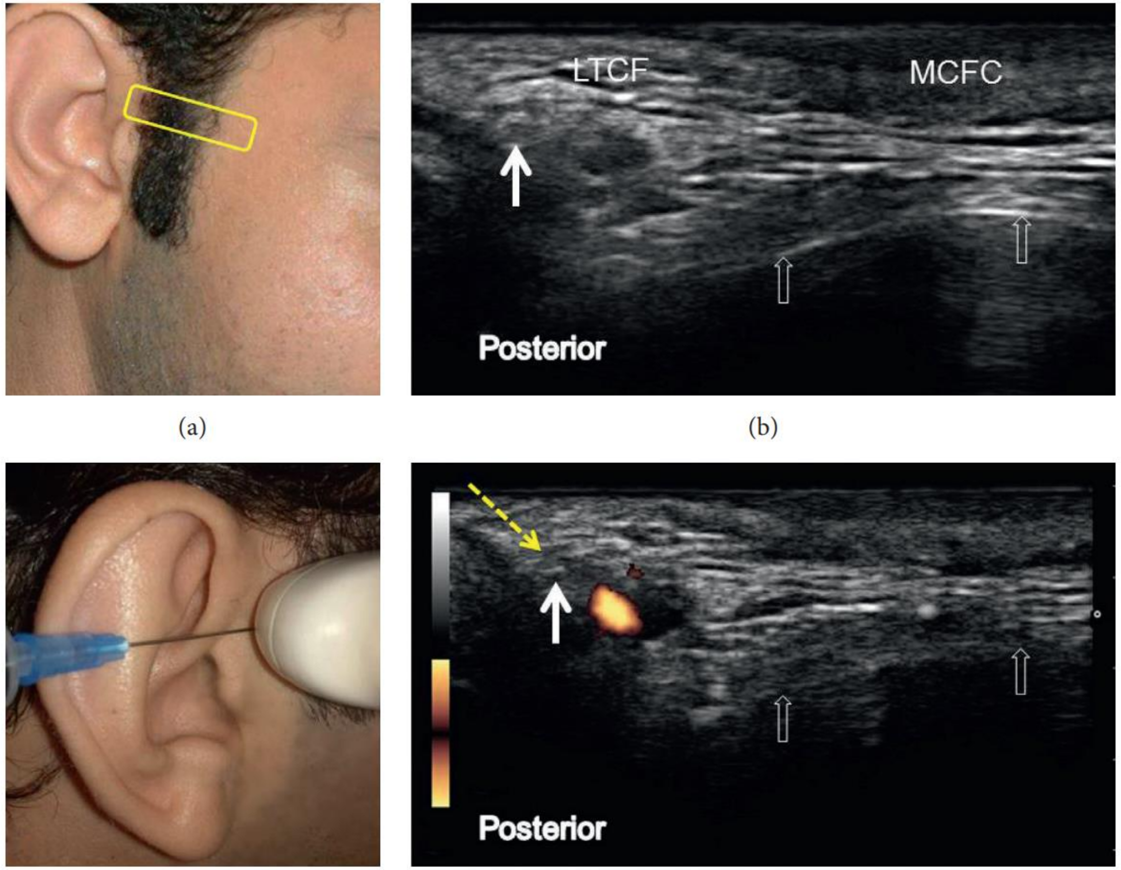


(a) (b) (c) (d)

Figure 5: Sonoanatomy and ultrasound-guided injection technique for the mental nerve: (a) the transducer position (yellow rectangle), (b) ultrasound imaging of the mental nerve (white solid arrow), (c) introducing the needle from the lateral side toward the midline using the in-plane approach to target the mental nerve, and (d) power Doppler image used to identify the mental vessels. The empty white arrows denote the body of the mandible. The asterisk (*) denotes the mental foramen on the face. The yellow dashed arrow denotes the needle trajectory. DLIM: depressor labii inferioris muscle; DAOM: depressor anguli oris muscle; JF: jowl fat; M: medial side. All the pictures were obtained from the face of the first author.

N. auroculotemporalis, Allam 2018

Herz-Jesu Krankenhaus Wien



(a) (b) (c) (d)

Figure 6: Sonoanatomy and ultrasound-guided injection technique for the auriculotemporal nerve: (a) the transducer position (yellow rectangle), (b) ultrasound imaging of the auriculotemporal nerve (white solid arrow), (c) introducing the needle in the posterior-to-anterior direction using the in-plane approach to target the auriculotemporal nerve, and (d) the power Doppler image of the superficial temporal artery. The empty white arrows denote the zygomatic arch. The yellow dashed arrow indicates the needle trajectory. MCFC: middle cheek fat compartment and LTCF: lateral temporal cheek fat. All the pictures were obtained from the face of the first author.

Pain Physician 2013; 16:E537-E545 • ISSN 2150-1149

Prospective Case Series

Ultrasound-Guided Trigeminal Nerve Block via the Pterygopalatine Fossa: An Effective Treatment for Trigeminal Neuralgia and Atypical Facial Pain

Antoun Nader, MD, Mark C. Kendall, MD, Gildasio S. De Oliveira Jr, MD, Jeffry Q. Chen, MD, Brooke Vanderby, MD, Joshua M. Rosenow, MD, and Bernard R. Bendok, MD

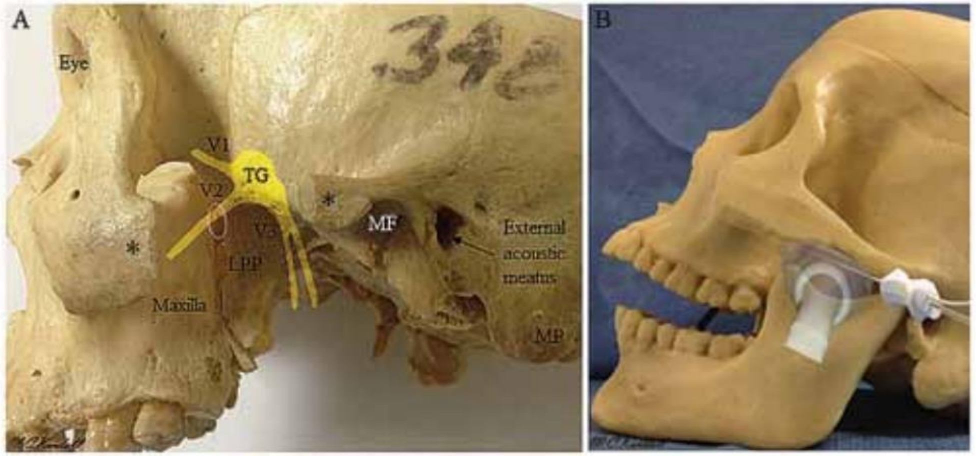


Fig. 2. *(A) Anatomical drawing showing the trigeminal ganglion (Gasserian ganglion) and its corresponding branches V1 ophthalmic, V2 maxillary, and V3 mandibular divisions. The pterygopalatine fossa is bound posteriorly by the palatine plates, medially and anteromedially by the palatine bone, and anteriorly by the maxillary bone. The pterygopalatine fossa is a very compact space and an injection into the space places it close to the foramen rotundum allowing the injectate to reach all branches of the trigeminal nerve. (B) A skull model showing the ultrasound probe positioned longitudinally just below the zgyomatic bone, superior to the mandibular notch, and anterior to the mandibular condyle. Using the in-plane approach, the needle is advanced from a lateral to medial and posterior to anterior direction toward the pterygopalatine fossa. * = zygomatic process (removed), TG = trigeminal ganglion, LPP = lateral pterygoid plate, MF = mandibular fossa, MP = mastoid process, dashed circle = target area.*

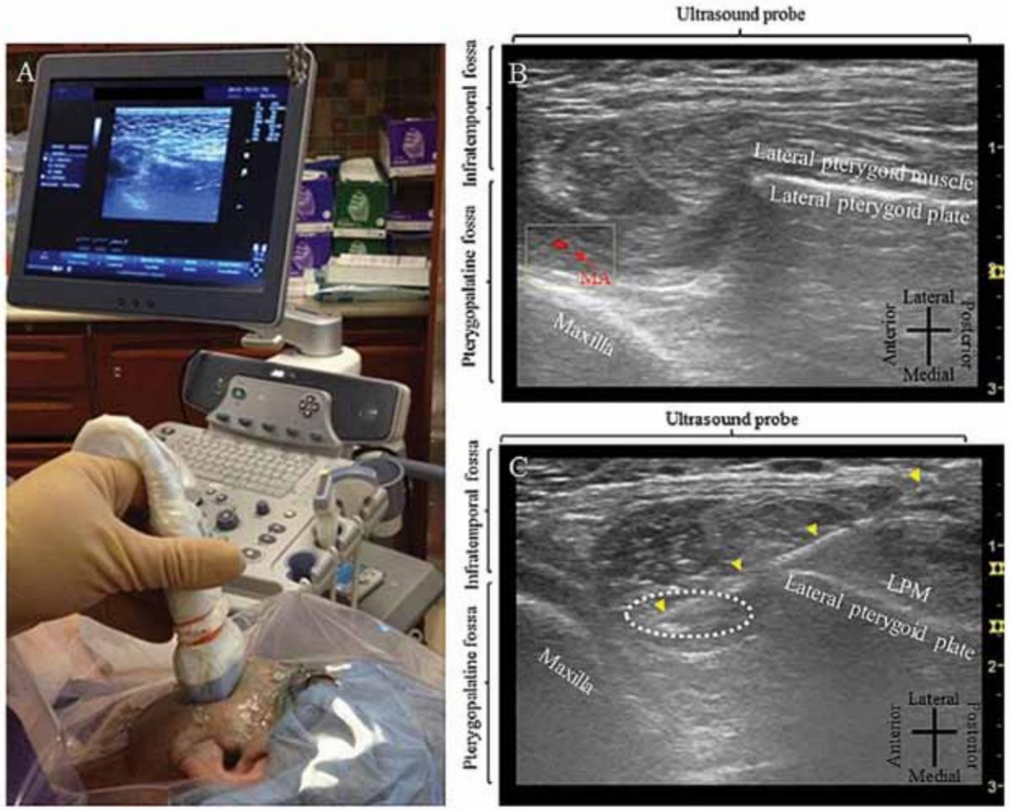
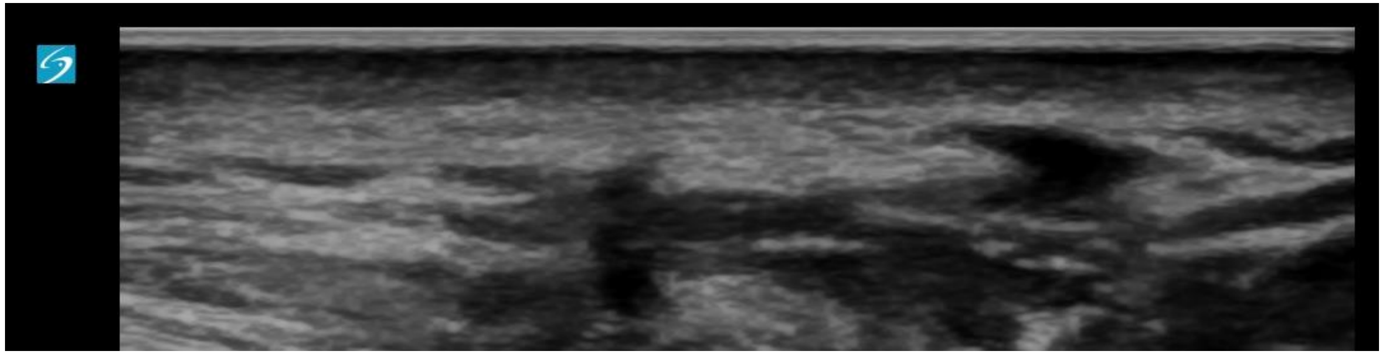
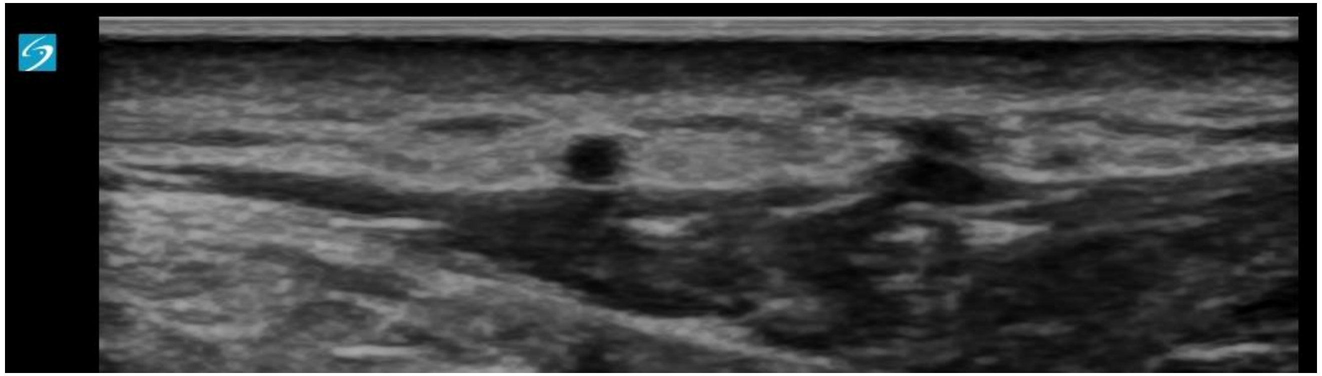


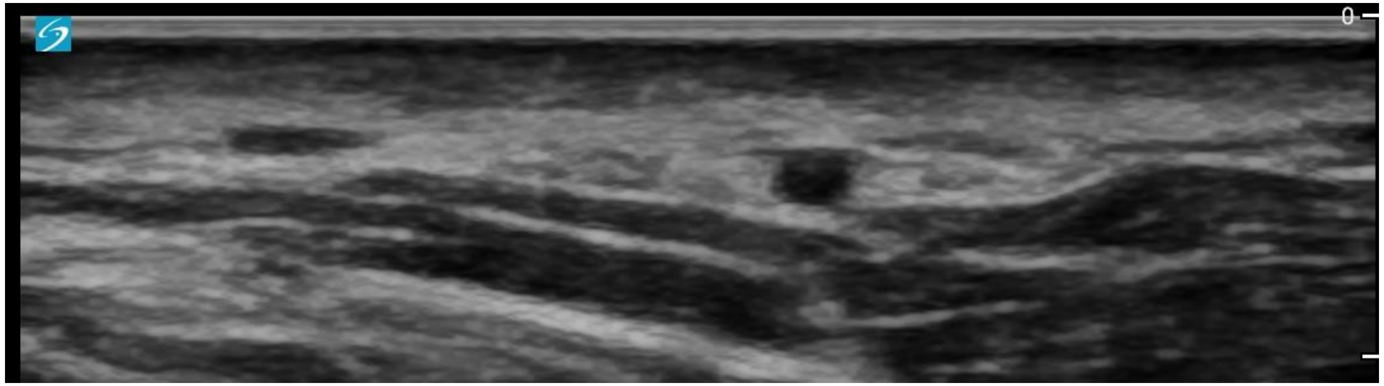
Fig. 1. A. The ultrasound probe is positioned below the zygomatic bone and above the condylar notch on the lateral part of the face. B. The ultrasound image represents a sagittal view with the top of the image displaying the transducer. The bottom of the image, beyond the lateral pterygoid plate, is medial in orientation. The infratemporal fossa, which is the entrance into the pterygoid palatine fossa, is seen on the left of the image labeled anterior. The maxillary artery appears as a deep structure. C. The ultrasound beam travels from lateral to medial through the infratemporal fossa. LPM = lateral pterygoid muscle, arrows = needle trajectory, dashed circle = target area, MA = maxillary artery (color flow Doppler).

Results: All patients achieved complete sensory analgesia to pin prick in the distribution of the V2 branch of the trigeminal nerve and 80% (12 out of 15) achieved complete sensory analgesia in V1, V2, V3 distribution within 15 minutes of the injection. All patients reported pain relief within 5 minutes of the injection. The majority of patients maintained pain relief throughout the 15 month study period. No patients experienced symptoms of local anesthetic toxicity or onset of new neurological sequelae.

N. auricularis magnus







Herz-Jesu
Krankenhaus Wien

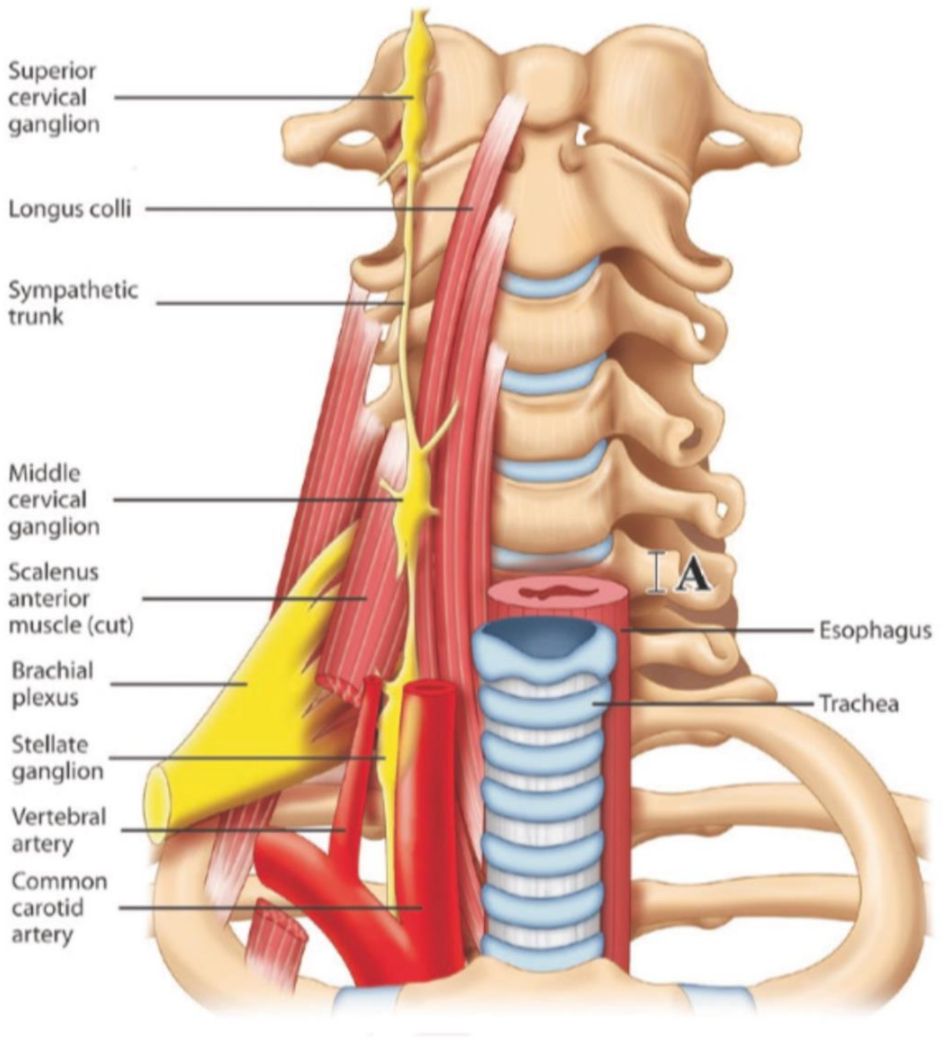
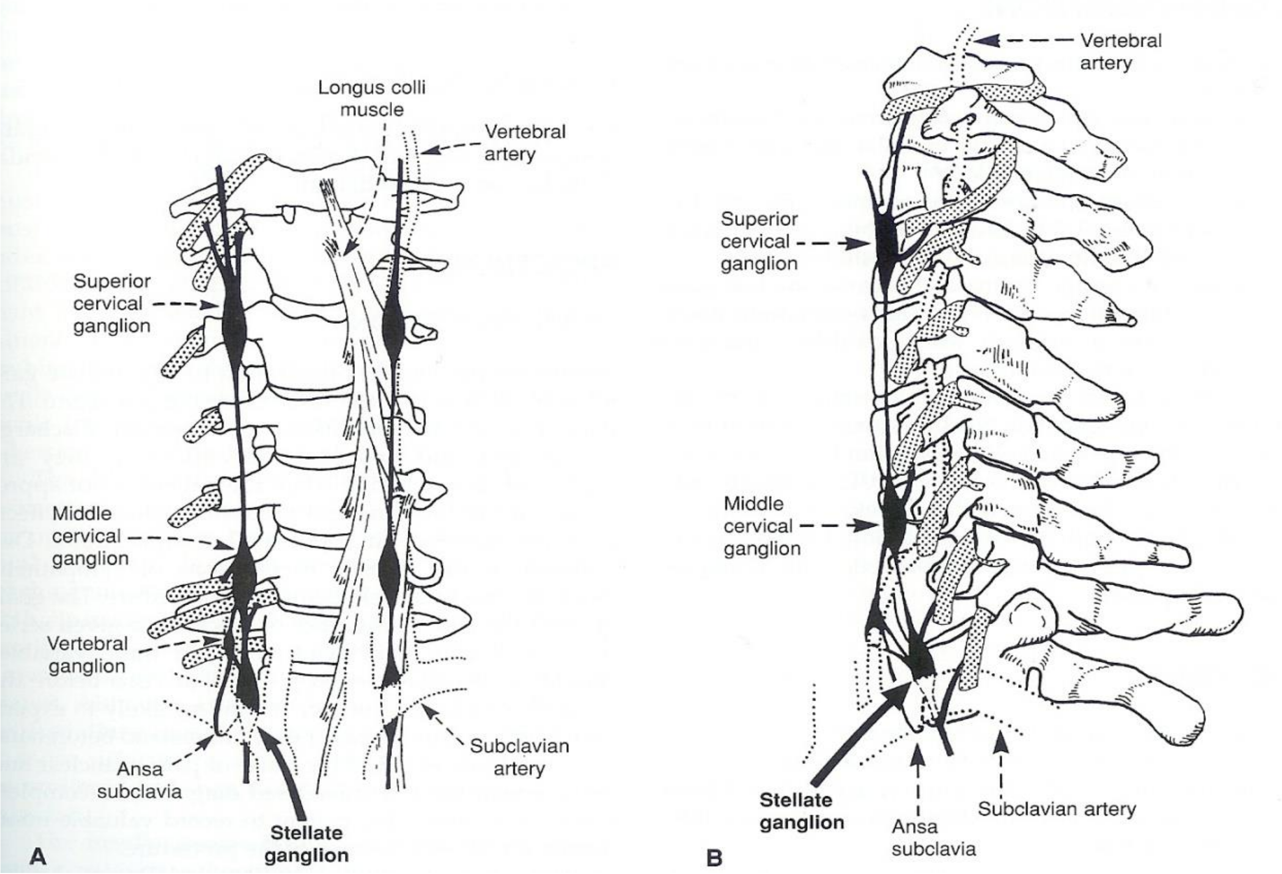


Fig. 3.1 Anatomy of cervical sympathetic chain. (Reprint with permission from Philip Peng Educational Series)



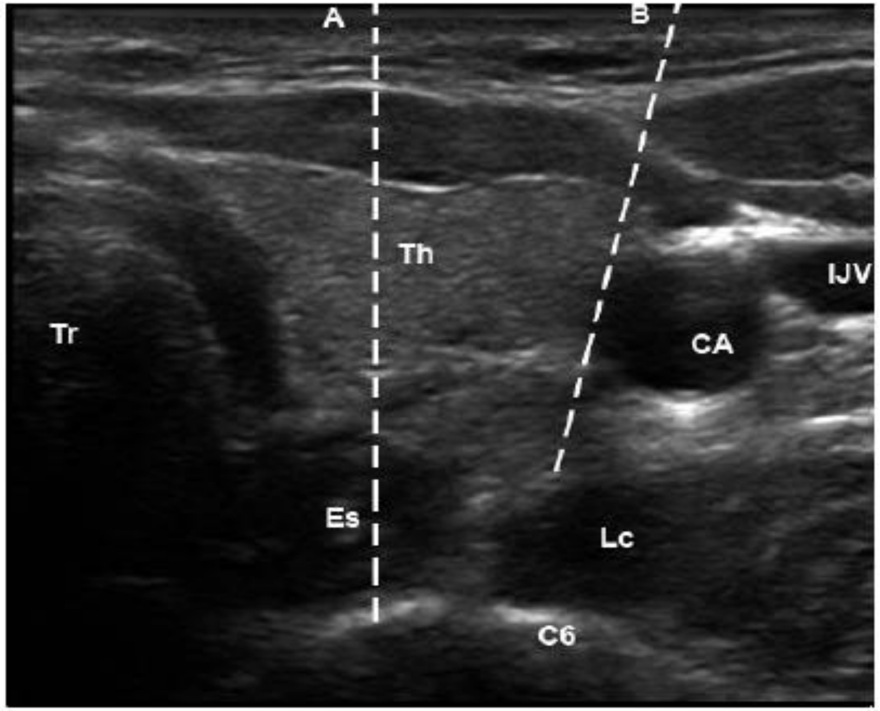
-Pain Physician 2007; 10:747-752 • ISSN 1533-3159

Herz-Jesu Krankenhaus Wien

Technical Report

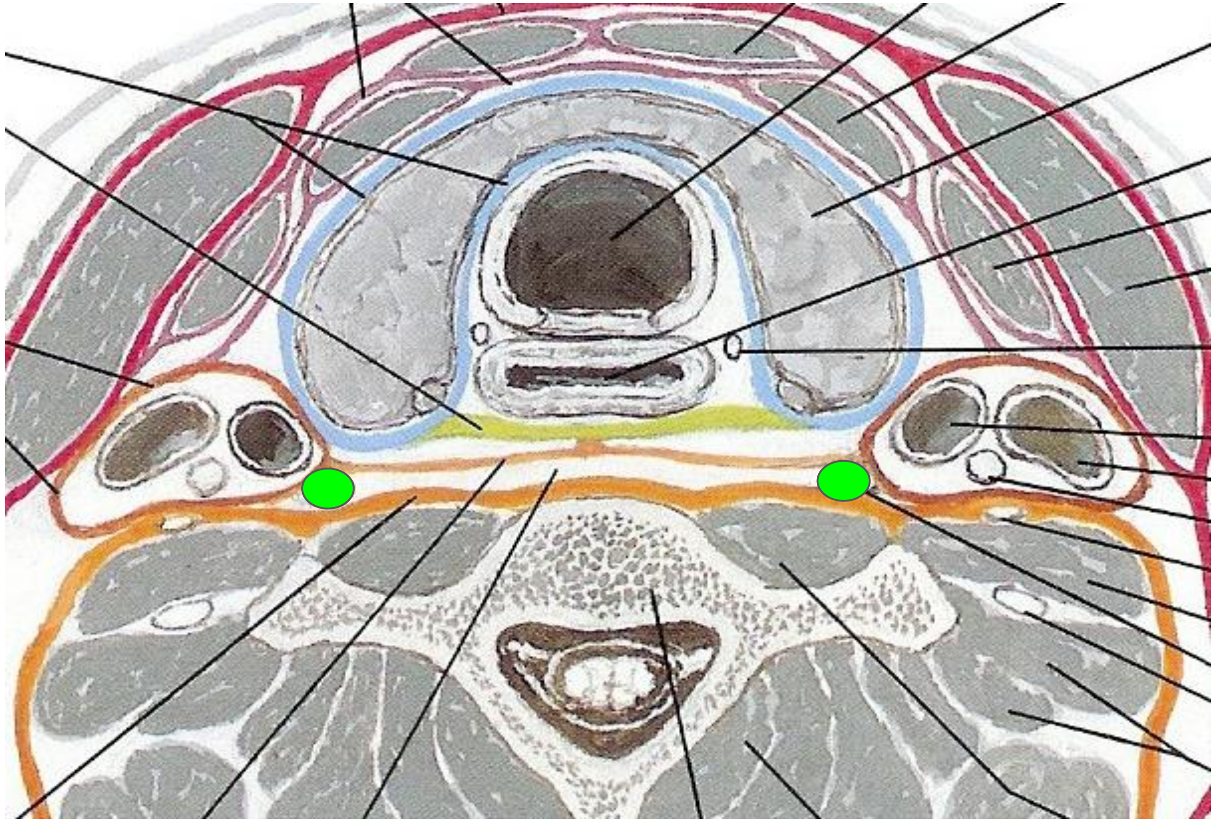
Ultrasound-guided Stellate Ganglion Block Successfully Prevented Esophageal Puncture

Samer Narouze, MD, Amaresh Vydyanathan, MD, and Nilesh Patel, MD



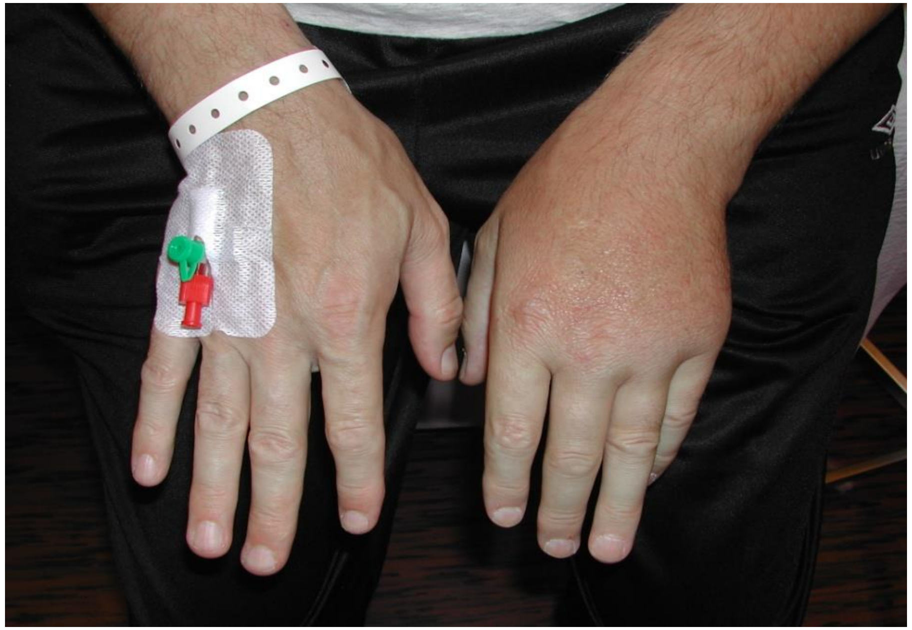
Ultrasound-guided stellate ganglion block may improve the safety of the procedure by direct visualization of the related anatomical structures and accordingly the risk of thyroid gland and vessels, vertebral artery, or esophagus injury may be minimized. Also ultrasound guidance will allow direct monitoring of the spread of the LA and hence complications like RLN palsy, intrathecal, epidural, or intravascular spread may be minimized as well.

Richtige Schichte:
Prävertebrale Faszie über dem M. longus colli



Horner Syndrom:
Ptosis, Myosis, Enophthalmus

CRPS 1: Morbus Sudeck



Breiteste Indikationen (to be discussed!):

Sympathisch unterhaltener Schmerz (CRPS)
Postzoster Neuralgie
Idiopathischer anhaltender Gesichtsschmerz
Posttraumatisches Stresssyndrom (PTSD)
Tinnitus
Hot flashes (postmenopausale „Wallungen“)
Therapierefraktäre VTs
Colitis ulcerosa

Akutschmerztherapie? Studien vor 5-10 Jahren…

Randomized Trial

Effect of Early Stellate Ganglion Blockade for Facial Pain from Acute Herpes Zoster and Incidence of Postherpetic Neuralgia

Mohamed Y. Makharita, MD[1], Yasser Mohamed Amr, MD[2], and Youssef El-Bayoumy, MD[1]

Pain Physician: November/December 2012; 15:467-474

Table 1. *Demographic data and patient's outcome in the studied groups. Values are in mean ±SD and in number (%). Group 1: placebo group. Group 2: stellate ganglion block group.*

Groups	Group 1 (n=30)	Group 2 (n=31)	*P* value
Age (years)	59.6 ± 3.2	60.6±2.2	0.14
Sex (male/ female)	14/16	13/18	0.71
Side (right/ left)	16/14	17/14	0.91
Incidence of PHN			
3 months	8/30 (26.7%)	2/31* (6.5%)	0.043
6 months	4/30 (13.3%)	0/31 * (0 %)	0.035
Patient Satisfaction Score			
3 months	2.2 ± 1.3	2.8 ± 1.1*	0.03
6 months	2.4 ± 0.5	3 ± 0.0*	0.004
Time of first block (days)	5.17 ± 0.8	6.26 ± 0.6	0.63
Duration of pain (days)	43.6 ± 28.7	23.8 ± 18*	0.002

* Significant when compared to the other group

Table 2. *Visual Analogue Score in the studied groups. Values are in mean ± SD. Group 1: placebo group. Group 2: stellate ganglion block group.*

	Basal	1 week	2 weeks	3 weeks	4 weeks	6 weeks	2 months	3 months	6 months
Group1	7.1 ± 1.1	4.7 ± 1.1	3.8 ± 1.3	2.8 ± 1.8	1.8 ± 2	1.1 ± 1.9	1.1 ± 1.9	1.1 ± 1.8	0.4 ± 1.1
Group2	7 ± 0.9	2.9 ± 0.6*	1.7 ± 0.8*	0.7 ± 1*	0.1 ± 0.6*	0.2 ± 0.7*	0.2 ± 0.5*	0.13 ± 0.5*	0 ± 0*
P value	0.79	< 0.001	< 0.001	< 0.001	< 0.001	0.014	0.015	0.007	0.042

* Significant when compared to the other group

KJP The Korean Journal of Pain

Korean J Pain 2017 January; Vol. 30, No. 1: 3-17
pISSN 2005-9159 eISSN 2093-0569
https://doi.org/10.3344/kjp.2017.30.1.3

| Review Article |

Effects of applying nerve blocks to prevent postherpetic neuralgia in patients with acute herpes zoster: a systematic review and meta-analysis

[1]Department of Preventive Medicine, College of Medicine, Korea University,
[2]Department of Anesthesiology and Pain Medicine, Asan Medical Center, University of Ulsan College of Medicine, Seoul,
[3]Department of Anesthesiology and Pain Medicine, Kangwon National University Hospital, Chuncheon, Korea

Hyun Jung Kim[1,*], Hyeong Sik Ahn[1,*], Jae Young Lee[2], Seong Soo Choi[2], Yu Seon Cheong[3], Koo Kwon[2], Syn Hae Yoon[2], and Jeong Gill Leem[2]

Background: Postherpetic neuralgia (PHN) is a common and painful complication of acute herpes zoster. In some cases, it is refractory to medical treatment. Preventing its occurrence is an important issue. We hypothesized that applying nerve blocks during the acute phase of herpes zoster could reduce PHN incidence by attenuating central sensitization and minimizing nerve damage and the anti-inflammatory effects of local anesthetics and steroids.

Methods: This systematic review and meta-analysis evaluates the efficacy of using nerve blocks to prevent PHN. We searched the MEDLINE, EMBASE, Cochrane Library, ClinicalTrials.gov and KoreaMed databases without language restrictions on April, 30 2014. We included all randomized controlled trials performed within 3 weeks after the onset of herpes zoster in order to compare nerve blocks vs active placebo and standard therapy.

Results: Nine trials were included in this systematic review and meta-analysis. Nerve blocks reduced the duration of herpes zoster-related pain and PHN incidence of at 3, 6, and 12 months after final intervention. Stellate ganglion block and single epidural injection did not achieve positive outcomes, but administering paravertebral blockage and continuous/repeated epidural blocks reduced PHN incidence at 3 months. None of the included trials reported clinically meaningful serious adverse events.

Conclusions: Applying nerve blocks during the acute phase of the herpes zoster shortens the duration of zoster-related pain, and somatic blocks (including paravertebral and repeated/continuous epidural blocks) are recommended to prevent PHN. In future studies, consensus-based PHN definitions, clinical cutoff points that define successful treatment outcomes and standardized outcome-assessment tools will be needed. (Korean J Pain 2017; 30: 3-17)

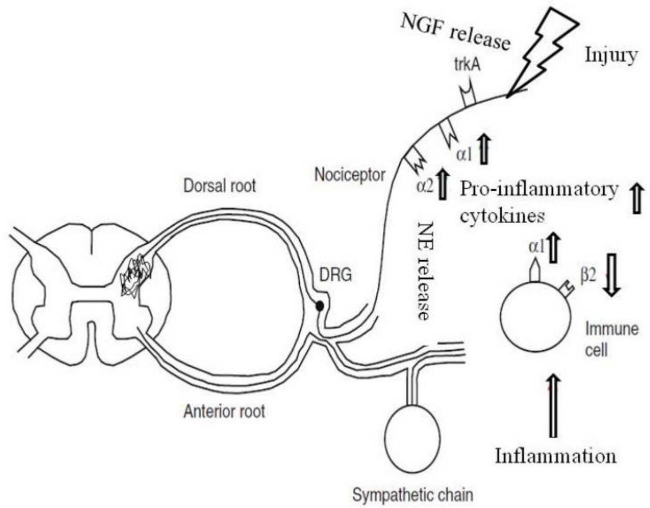


Fig. 2. The sympathetic nervous system (SNS) and pain. Inflammation activates immune dendritic cells. β-2 receptors are downregulated and α-1 receptors are up-regulated on these immune cells. Following nerve injury, functional adrenoreceptors are expressed on peripheral nociceptors. Activation of the SNS increases the level of norepinephrine (NE), which activates α-adrenoreceptors on the afferent fibers, and releases nerve growth factor (NGF). NGF sensitizes peripheral nociceptors through trk A receptors.

CONCLUSION

SGB can provide valuable diagnostic and therapeutic benefit for different types of facial pain. Using ultrasound-guided technique, SGB can be performed with improved quality and safety compared with the traditional blind technique.

Review Article

pISSN 2383-9309 eISSN 2383-9317
J Dent Anesth Pain Med 2016;16(3):159-163 http://dx.doi.org/10.17245/jdapm.2016.16.3.159

Therapeutic potential of stellate ganglion block in orofacial pain: a mini review

Younghoon Jeon

Department of Anesthesiology and Pain Medicine, School of Dentistry, Kyungpook National University, Daegu, Korea

Orofacial pain is a common complaint of patients that causes distress and compromises the quality of life. It has many etiologies including trauma, interventional procedures, nerve injury, varicella-zoster (shingles), tumor, and vascular and idiopathic factors. It has been demonstrated that the sympathetic nervous system is usually involved in various orofacial pain disorders such as postherpetic neuralgia, complex regional pain syndromes, and atypical facial pain. The stellate sympathetic ganglion innervates the head, neck, and upper extremity. In this review article, the effect of stellate ganglion block and its mechanism of action in orofacial pain disorders are discussed.

Keywords: Head; Orofacial; Pain; Stellate ganglion block; Sympathetic Nervous System.

Ultrasound Imaging for Stellate Ganglion Block: Direct Visualization of Puncture Site and Local Anesthetic Spread

A Pilot Study

Stephan Kapral, M.D., Peter Krafft, M.D., Max Gosch, M.D., Dominik Fleischmann, M.D.,* and Christian Weinstabl, M.D.

326 Regional Anesthesia Vol. 20 No. 4 July–August 1995

Table 1. Quality Scores of Stellate Ganglion Block for Both Groups 10 Minutes After the Administration of Local Anesthetic Solution*

	Number of Patients			
	Group A		Group B	
Quality Score	Vasodilation	Horner's syndrome	Vasodilation	Horner's syndrome
0	1	2	0	0
I	11	10	12	12
II	0	0	0	0

*Group A, blind technique; group B, imaging technique.

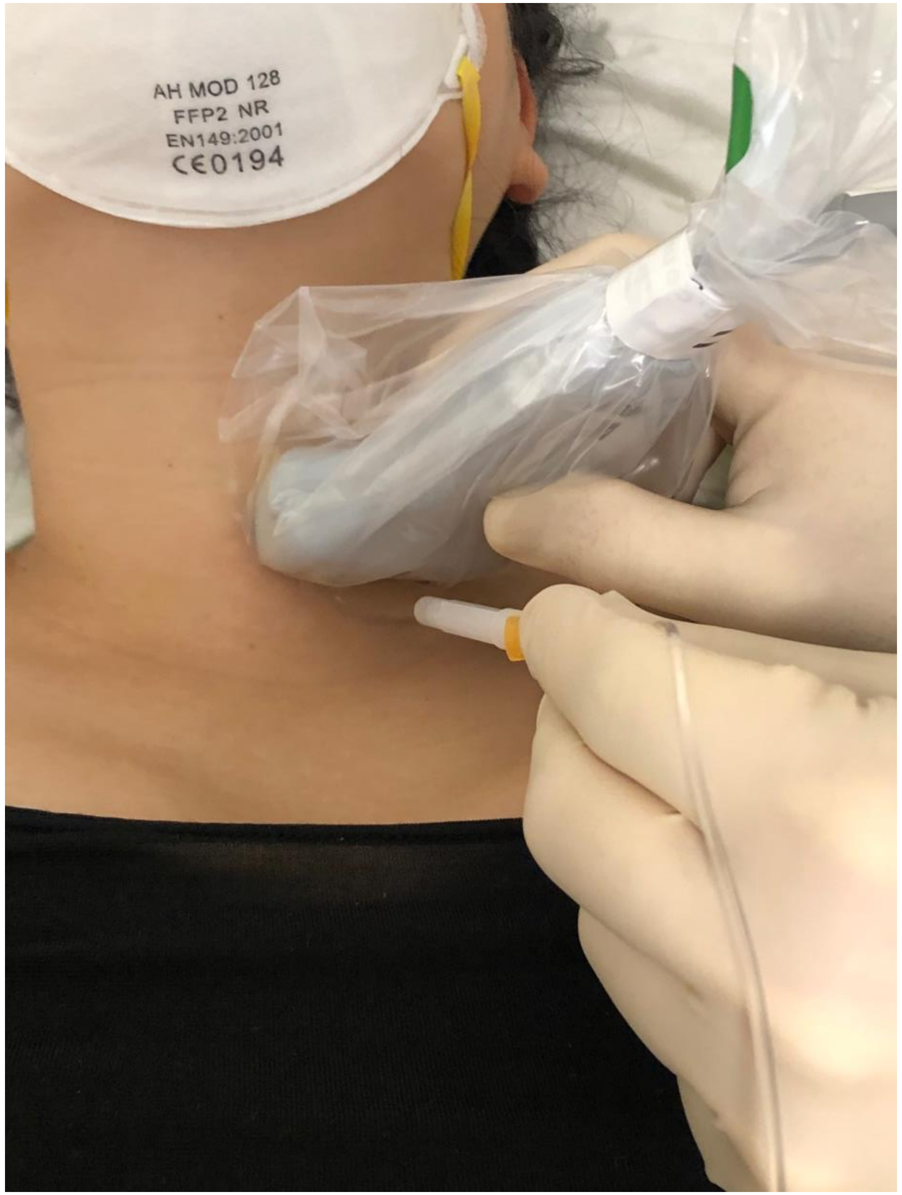
Table 2. Quality Scores of Stellate Ganglion Block for Both Groups 30 Minutes After the Administration of Local Anesthetic Solution*

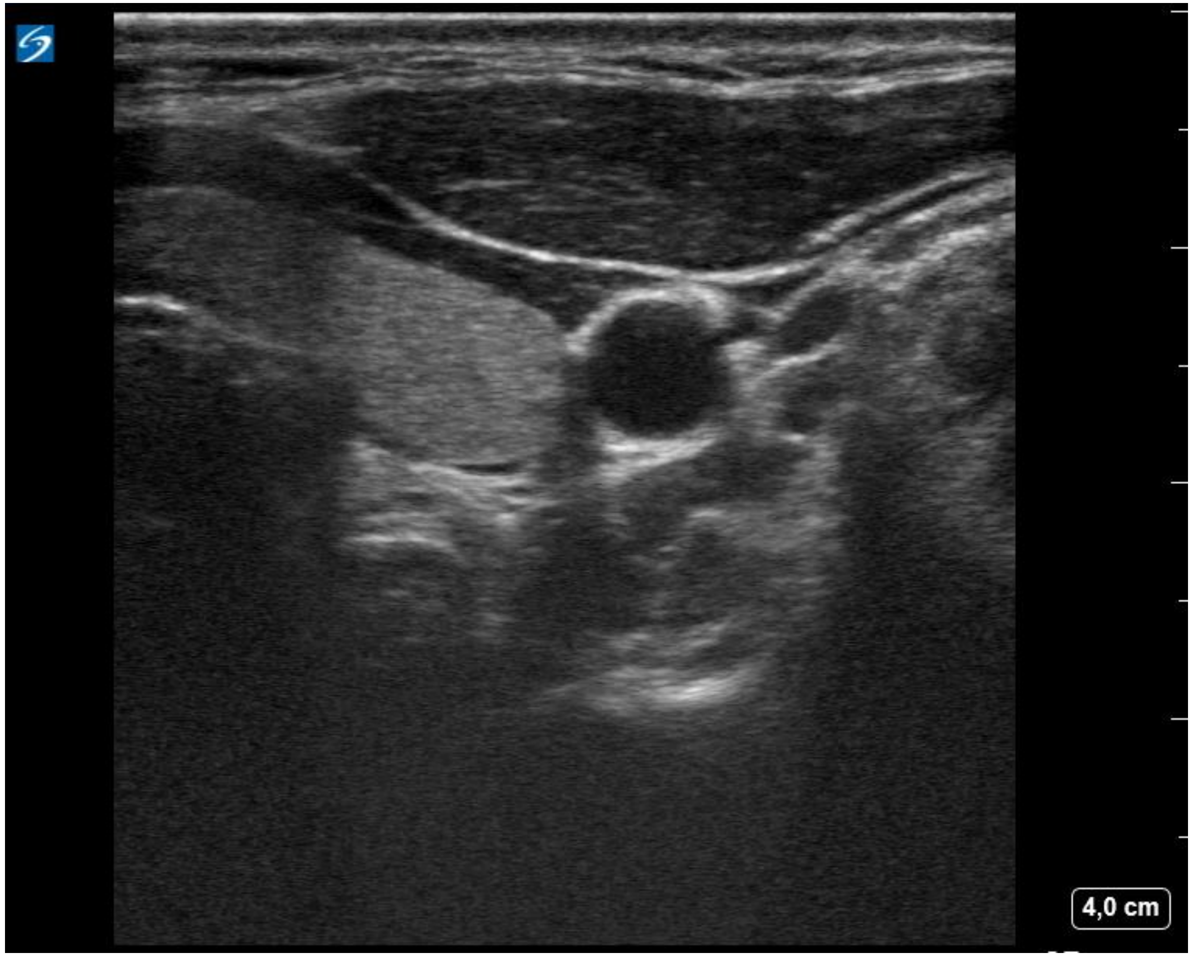
	Number of Patients			
	Group A		Group B	
Quality Score	Vasodilation	Horner's syndrome	Vasodilation	Horner's syndrome
0	0	1	0	0
I	9	10	8	8
II	3	1	4	4

*Group A, blind technique; group B, imaging technique.

Herz-Jesu
Krankenhaus Wien

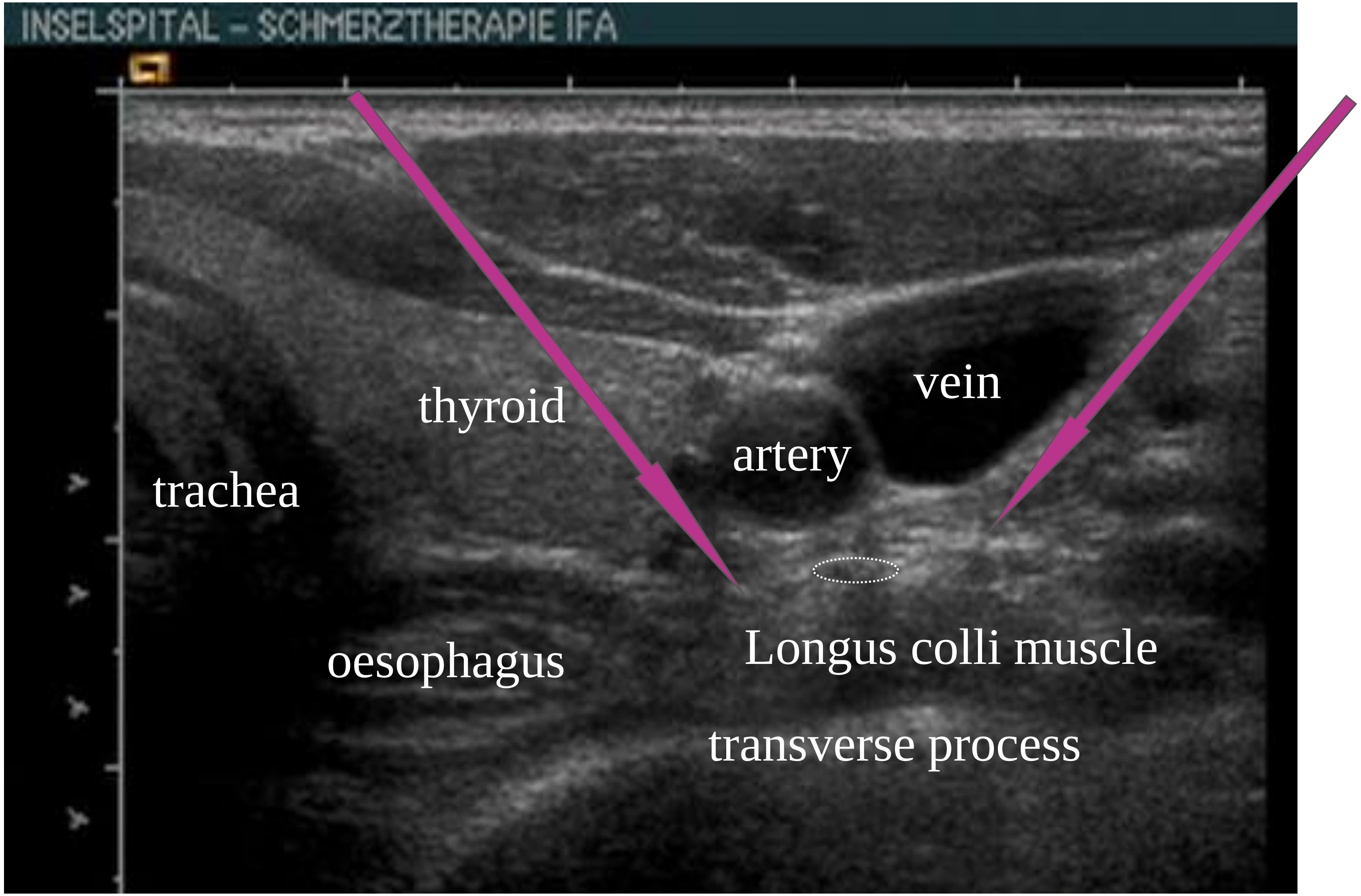
OOP medial der Carotis





„Topography for stellate ganglion block”

Ultrasound scan transversal ventral at C6



Fernandes L, *et al*. *Pract Neurol* 2021;**21**:30–35. doi:10.1136/practneurol-2020-002612

Table 1 Evidence base for the efficacy of peripheral nerve block in treating different headache disorders

Headache disorder	Type of nerve block studied	Evidence level*
Acute migraine	GON	2B[8]
Chronic migraine	GON	2A[9 10]
Cluster headache	GON, suboccipital	1B[11 12]
Occipital neuralgia	GON	2B[13]
Chronic daily headache	GON	2B[14]
Other trigeminal autonomic cephalalgias		
SUNCT/SUNA	Supraorbital, supratrochlear	4[5]
Paroxysmal hemicrania/ hemicrania continua	Supraorbital, supratrochlear	4[15]
Other painful cranial neuralgias	Supraorbital, auriculotemporal	4[16 17]

*Based on the Oxford Centre for Evidence-based Medicine Levels of Evidence.
GON, greater occipital nerve; SUNCT, short-lasting unilateral neuralgiform headache attacks with conjunctival injection and tearing; SUNA, short-lasting unilateral neuralgiform headache attacks with cranial autonomic features.

Key points

- Peripheral nerve blocks have a role in acute and transitional treatment of acute migraine, chronic migraine, cluster headache and painful cranial neuralgias.
- Patient position and anatomical landmarks are key for their successful delivery.
- Corticosteroids are frequently used for greater occipital nerve blocks but may also be used for lesser occipital nerve blocks.
- Supraorbital, supratrochlear and auriculotemporal nerve blocks involve a combination of lidocaine and/or bupivacaine.
- Uncommon but important adverse effects include transient dizziness, light-headedness, transient headache exacerbation, and rarely localised lipoatrophy and alopecia with corticosteroids.

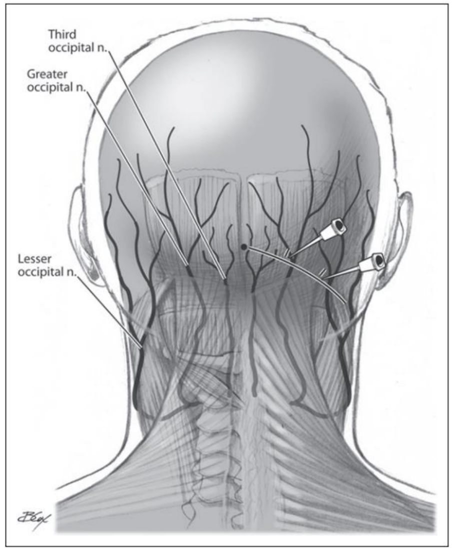


Fig 1.—Greater and lesser occipital nerve blocks.

Headache
ISSN 0017-8748
doi: 10.1111/head.12053
Published by Wiley Periodicals, Inc.

Review Article

Expert Consensus Recommendations for the Performance of Peripheral Nerve Blocks for Headaches – A Narrative Review

Andrew Blumenfeld, MD; Avi Ashkenazi, MD; Uri Napchan, MD; Steven D. Bender, DDS; Brad C. Klein, MD; Randall Berliner, MD; Jessica Ailani, MD; Jack Schim, MD; Deborah I. Friedman, MD, MPH; Larry Charleston IV, MD; William B. Young, MD; Carrie E. Robertson, MD; David W. Dodick, MD; Stephen D. Silberstein, MD; Matthew S. Robbins, MD

Headache Disorder	Nerve(s) Blocked	Evidence
Primary headache disorders		
Migraine	GON, STN, SON	Retrospective[23-25] Prospective, noncontrolled[12,26]
Cluster headache	GON	Case series[4,13] Open label[14] Retrospective[15] Double blind, placebo controlled[7,8]
Chronic daily headache	GON	Case series[4] Open label[27] Prospective, noncontrolled[28] Prospective, randomized controlled[20]
Hemicrania continua	GON, SON	Case series[4,18]
New daily persistent headache	GON	Case series[4,29]
Secondary headache disorders		
Cervicogenic headache	GON, LON, SON	Case series[30,31] Retrospective[25] Prospective, noncontrolled[32] Prospective, comparative[33] Double blind, placebo controlled[34]
Post-traumatic headache	GON	Retrospective[35]
Post-dural puncture headache	GON, LON	Prospective, comparative[36]
Cranial neuralgias		
Supraorbital neuralgia	SON	Case series[37-39]
Auriculotemporal neuralgia	ATN	Case series[40]

ATN = auriculotemporal nerve; GON = greater occipital nerve; LON = lesser occipital nerve; SON = supraorbital nerve; STN = supratrochlear.nerve.

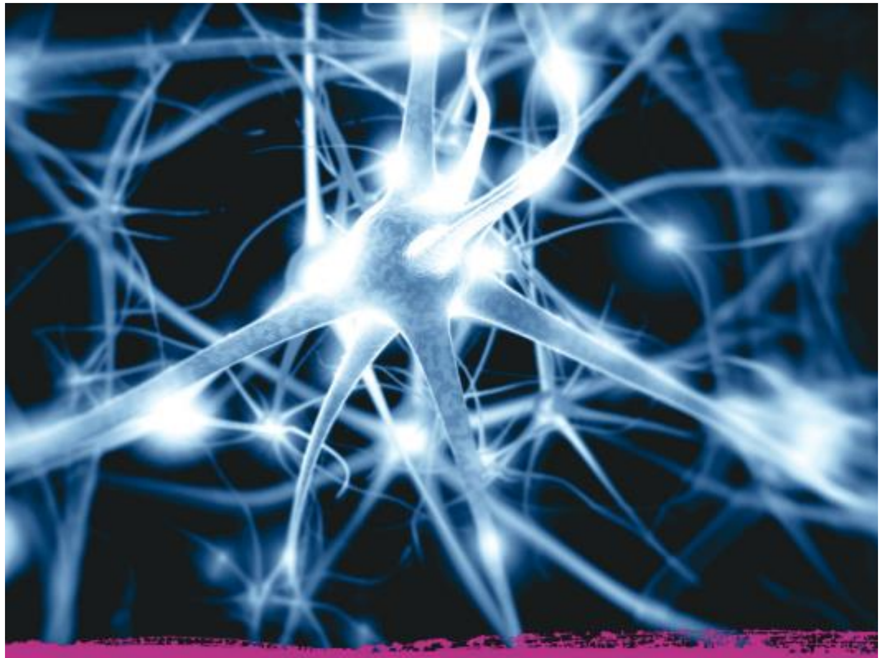
Zusammenfassung

Nervenblöcke haben einen wichtigen Stellenwert bei vielen Kopf- und Gesichtsschmerzen

- Clusterkopfschmerz
- Migraine
- Neuralgien
- Postpunktioneller KS
- Anhaltender idiopathischer Gesichtsschmerz

Ultrasachall-gezielte Techniken erhöhen die Präzision, Spezifität und Sicherheit

Weitere Studiendaten zu Indikationen und Wirkmechanismen erforderlich



Einladung

Im neuen Veranstaltungs-zentrum

15. Symposium für Ultraschall-gezielte Nervenblockaden

Die spannendsten Fälle aus 15 Jahren

Samstag, 14. Oktober 2023, Veranstaltungszentrum
Herz-Jesu Krankenhaus, Baumgasse 20A, 1030 Wien

Gesundheit
kommt von Herzen.

Herz-Jesu
Krankenhaus Wien

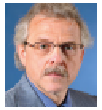
Wissenschaftliches Programm

09.00 – 09.10	Beginn/Überblick	Greher
09.10 – 09.40	15 spannende anatomische Varianten – und was dann?	Moriggl
09.40 – 10.40	Fallpräsentationen	Strasser Hüsemann Maric Skific Greher
10.40 – 11.00	US-guided Pain Interventions	Fabregat
11.00 – 11.30	Kaffeepause/Industrieausstellung	
11.30 – 12.15	Ultraschall Live-Demonstration	Moriggl
12.15 – 13.30	Mittagspause/Mittagessen	
13.30 – 15.00	Praktische Ultraschall-Übungen mit Tutoring in Kleingruppen	
15.00	Ende der Veranstaltung	

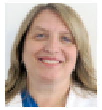
Referenten

Prim. Dr. Manfred Greher, MBA
Abteilung für Anästhesie, Intensivmedizin und Schmerztherapie
Herz-Jesu Krankenhaus, Wien

Dr. Gustavo Fabregat, PhD
Dept. de Anestesia, Reanimación y Tratamiento del Dolor
Consorcio Hospital General Universitario, Valencia, Spanien



Univ.-Prof. Dr. Bernhard Moriggl
Sektion für Klinisch-Funktionelle Anatomie, Department für Anatomie, Histologie und Embryologie
Medizinische Universität Innsbruck, Tirol



Dr.[in] Stela Maric Skific
Abteilung für Anästhesie, Intensivmedizin und Schmerztherapie
Herz-Jesu Krankenhaus, Wien

Dr. Markus Hüsemann
Abteilung für Anästhesie, Intensiv- und Schmerzmedizin
Klinik Ottakring, Wien

Dr.[in] Alexandra Strasser
Abteilung für Anästhesie, Intensivmedizin und Schmerztherapie
Herz-Jesu Krankenhaus, Wien

ÄRZTEKAMMER FÜR WIEN

Die Veranstaltung wurde für das Fach Anästhesiologie und Intensivmedizin für das Diplomfortbildungsprogramm der Österreichischen Ärztekammer für 6 Punkte eingereicht, bei einer Online-Teilnahme für 4 Punkte.

Samstag, 14. Oktober 2023
www.kh-herzjesu.at/anmeldung