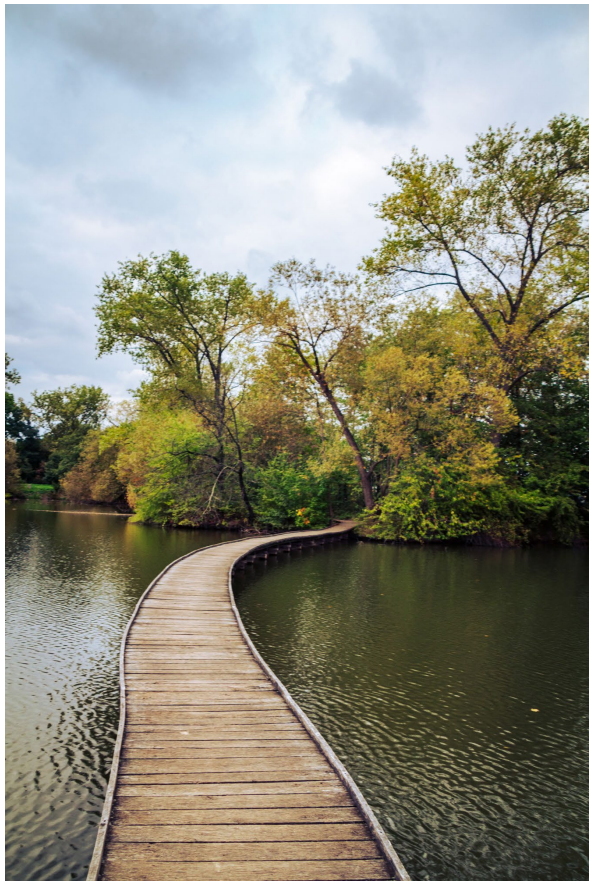
Co je opravdu důležité Regionální anestezie u pacientů na antitrombotické léčbě

Daniel Nalos KAPIM Ústí nad Labem

Černé labutě medicínské praxe



Černé labutě medicínské praxe

Tromboembolie

Krvácení

Je třeba převést pacienty bezpečně přes úskalí

Tromboembolie a Krvácení

Co musíme znát a zvládnout v perioperačním období

- Předoperační stav koagulace.

Co musíme znát a zvládnout v perioperačním období

- Předoperační stav koagulace,
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- Posoudit typ a riziko výkonů

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- Individuální klinickou rozvahu nad zvoleným terapeutickým přístupem

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- Posoudit typ a riziko výkonů
- Individuální klinickou rozvahu nad zvoleným terapeutickým přístupem
- Zvolit optimální načasování našich intervencí.

- Krvácení je možná komplikace po neuroaxiálním i po periferním bloku.
- Riziko krvácení se zvyšuje u pacientů na anti agregační a antikoagulační léčbě.
- Experti evropských odborných společností ESAIC a ESRA provedli v roce 2022 revizi guidelines z roku 2018.
- S použitím validní literatury a pomocí expertního Delphi procesu formulovali celkem 40 praktických doporučení pro konkrétní situace.

Seznam skupin léků s antitrombotickým účinkem

- Antagonisté vitaminu K (Warfarin, acenocoumerol, phenoprocoumon)
- Přímé perorální antikoagulancia (rivaroxaban apixaban edoxaban, dabigatran)
- Nízkomolekulární hepariny (LMWH, enoxaparin)
- Nefrakcionovaný heparin (UFH)
- Aspirin
- $P2Y_{12}$ inhibitory (clopidogrel, prasugrel, ticagrelor)

Časový interval je základní bezpečnostní prvek

Sledujeme tři časové intervaly

Dobu mezi podáním antitrombotických léků a zavedením regionální anestézie.

Časový interval je zásadní veličinou i pro bezpečné pokračování v antitrombotické léčbě po aplikaci blokády.

Časový interval je důležitý i pro timing vytažení případného katetru.

Stav hemokoagulace je dynamický stav

Červený časový interval

Krvácivé komplikace do epidurálního prostoru

je třeba chirurgicky vyřešit do 6 hodin od vzniku prvních příznaků.

Použití asistence ultrazvuku při periferních blokádách

Snižuje sice statisticky riziko krvácivých komplikací

ale při jeho použití platí stejné časové intervaly,

jako pro jiné metody

Jak identifikovat blokády s rizikem závažného krvácení

- Následky případného krvácení mohou být klinicky závažné až katastrofické.
- Aplikační místo je v hloubce a ošetření nechtěného krvácení je obtížné.

- Ve všech sporných případech je třeba udělat risk /benefit rozvahu.

Klinická úvaha

- Zvážení nejmenšího rizika pro pacienta.

Příklad: Extrakce kovu z palce
u obézního pacienta na domácí kyslíkové
Terapii.

Blokáda II. větve trigeminu ve fossa pterygopalatina

Maxillary and Temporal Nerve Blockade for Plastic Surgery in Geriatric Patients

Nalos D.[1], Kačer P.[2]

[1]Clinic of Anesthesiology, Perioperative Medicine and Intensive Care, J. E. Purkyně University and Masaryk Hospital in Ústí nad Labem, Czech Republic

[2]Dept. of Surgery, Masaryk Hospital in Ústí nad Labem, Czech Republic

The objective of the work:

This pilot clinical case series describes a technique of ultrasound guided blockade of second and third branches of the trigeminal nerve for facial surgery in geriatric patients.

Introduction:

Due to the proximity of the operating field, is for general anesthesia necessary ensure airway instrumentaly. Block nerve trigeminus is traditionally carried out blindly under the zygomatic arch and inssisura mandibulae, the needle contact with pterygoid lamina and then the needle is introduced further and dorsally approximately 1 cm deeper. The recommended dose is 5 ml of the anesthetic. Another technique is recommended to apply 10 ml of anesthetic when in case to contact with lateral pterygoid plate. Assistance of ultrasound allows the identification a maxillary artery, veins and pterygoid lateral plate. Visualization of the nerve and vessels are in geriatric patients rare.

Material and method:

Five geriatric patients (4 females and 1 male), ASA III -IV, average age of 77,0 years were indicated for tumor surgery located in the face at the Department of Surgery, Masaryk Hospital in Usti nad Labem. Anesthesia was performed using ultrasound guided-blockade of third branch of the trigeminal nerve in the fossa pterygopalatina, and nerve temporalis branch of nerve mandibular a technique developed at clinic of Anesthesiology, Perioperative and Intensive Care Medicine Department of the same hospital.

Anatomy:

The progress of the second and third branches of the trigeminal neuralgia is available to intervene in the area of transdermal incisura mandibulae cranially bounded by arcus zygomaticus. The nerve temporal, branch of nerve mandibular is accessible to blockade approximately 1cm deep under arcus zygomaticus. In the path of the needle can be a salivary gland with its vascular supply in young person. The second branch of the trigeminal nerve leaves the skull cavity in the foramen rotundum, continuing on to the soft tissues of the fossa pterygopalatine.

Maxillary artery branches

Methodology:

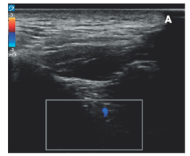
The examination surroundings of zygomatic arch by ultrasound carried out vertically and horizontally. In the image we can find the salivary gland, branches of the mandible, zygomatic arch and look towards the fossa pterygopalatine. We identify in the color display the vascular structures, of which the most prominent is a. maxillary. We identify lateral pterygoid plate and back of the maxillae. The needle is introduced perpendicular to the skin 1 cm low of the zygomatic arch. The subcutaneous infiltration of 3-4 ml local anesthetics ensures the block of temporal nerve. The needle be aimed slightly anteriorly, direction to the back of the maxillae, passing by lateral pterygoid plate approximately five millimeters.

After negative aspiration we gradually apply a local anesthetic in volume 5-8 ml. In two patients we supplement this block by superficial cervical blockade by 4 ml the same concentration of local anesthetics. By our patients has been a striking low vascularization of the area.

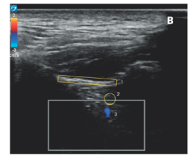
Results:

The block was successful in all five patients, allowing for spontaneous breathing and patient cooperation under mild sedation. Cardiovascular stability was excellent despite the high anesthetic risk. (ASA III-IV).

Gender	ASA	Age	Diagose	Surgical procedure
Female	III.	76	spinalioma faciei l.dx.	excize + lobe sec. Limberg
Female	IV.	89	basalioma faciei l. dx.	excize + lobe sec. Limberg
Female	III.	66	melanoma faciei l.dx	excize + lobe sec. Limberg
Male	IV.	67	basalioma faciei l.dx	excize + lobe sec. Limberg
Female	IV.	92	spinalioma faciei l.dx.	excize + lobe sec. Limberg



Fossa pterygopalatine



1. lateral pterygoid plate 2. nerve maxillary 3. artery maxillary

Conclusion:

The blockade of the second branch of the trigeminal nerve in the fossa pterygopalatina and nerve temporalis proved to be alternative technique suitable for facial surgery in high risk geriatric patients. The ultrasound guidance allowed visualization of the lateral pterygoid lamina, the maxillary artery and other vascular structures during the spread of local anesthetic. This reduced the likelihood of intravascular anesthetic administration.

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KLINIKA ANESTEZIOLOGIE, PERIOPERAČNÍ A INTENZIVNÍ MEDICÍNY
FAKULTY ZDRAVOTNICKÝCH STUDIÍ UNIVERZITY J. E. PURKYNĚ V ÚSTÍ NAD LABEM
A KRAJSKÉ ZDRAVOTNÍ, a. s. – MASARYKOVY NEMOCNICE V ÚSTÍ NAD LABEM, o. z.

Kategorizace nervových blokád podle rizika nekontrolovaného krvácení

Table 2 Categorisation of nerve blocks

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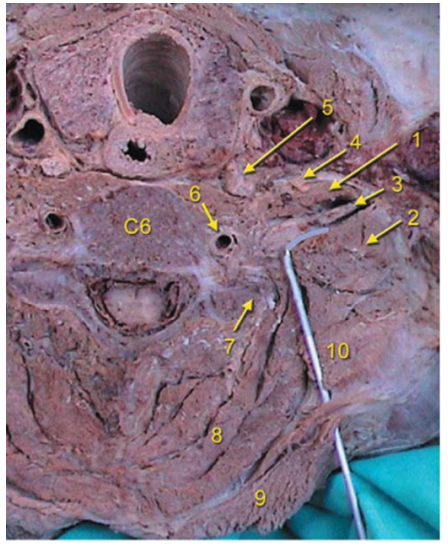
Hlava, krk

- Blok ggl. stelatum
- Hluboký blok cervikálního plexu (dle Pippa) je blok brachiálního plexus
- Krční paravertebrální blok
- Bloky okolo prvního žebra (infra i supraklavikulární)

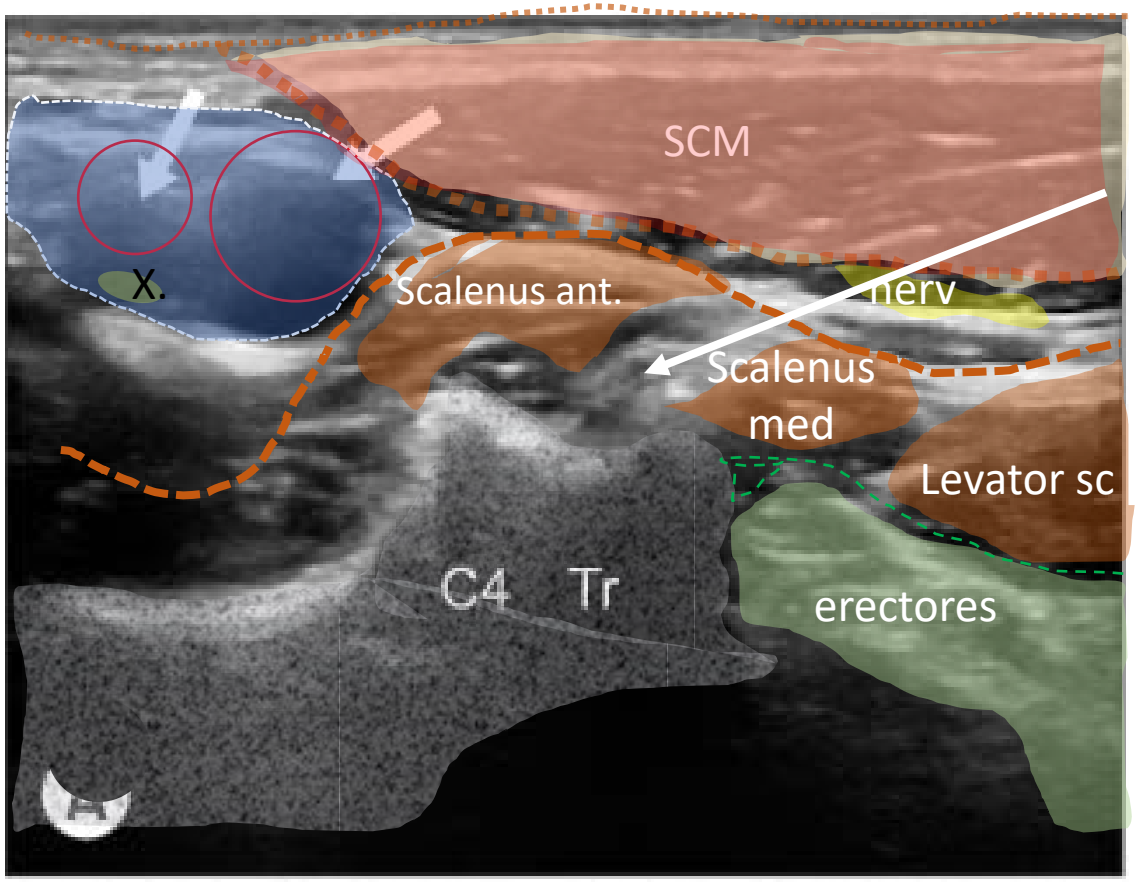
- Zcela obsolentní přístup k brachiálnímu plexu.
- Dnes nahrazen interskalenickým blokem.



Source: Hadzic A: *The New York School of Regional Anesthesia Textbook of Regional Anesthesia and Acute Pain Management:*

Ultrazvukový obraz v úrovni bifurkace karotid cílové místo hlubokého cervikálního bloku

- Opuštěná elektrostimulační metoda pro operace karotid.
- Krev ve stříkačce až ve 30%.
- Tento přístup je nahrazen mediálním blokem cervikálního plexu za asistence ultrazvuku.



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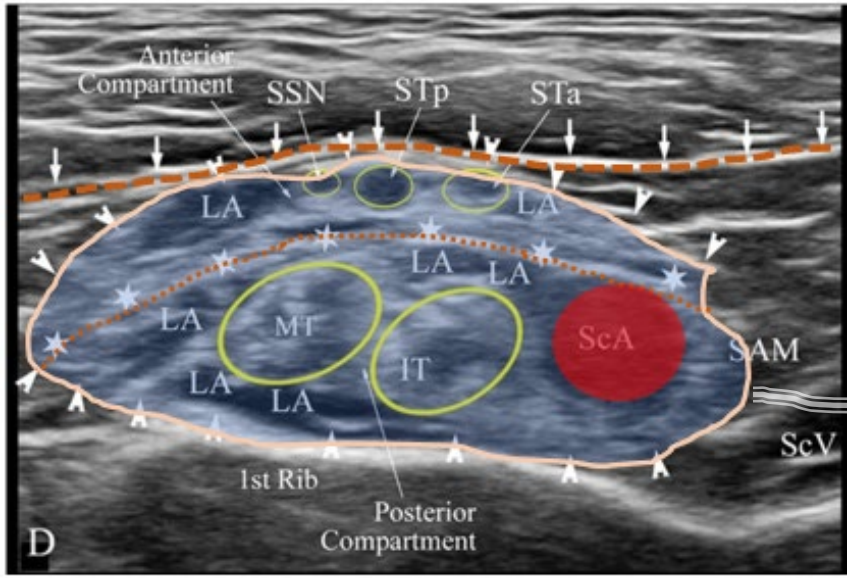
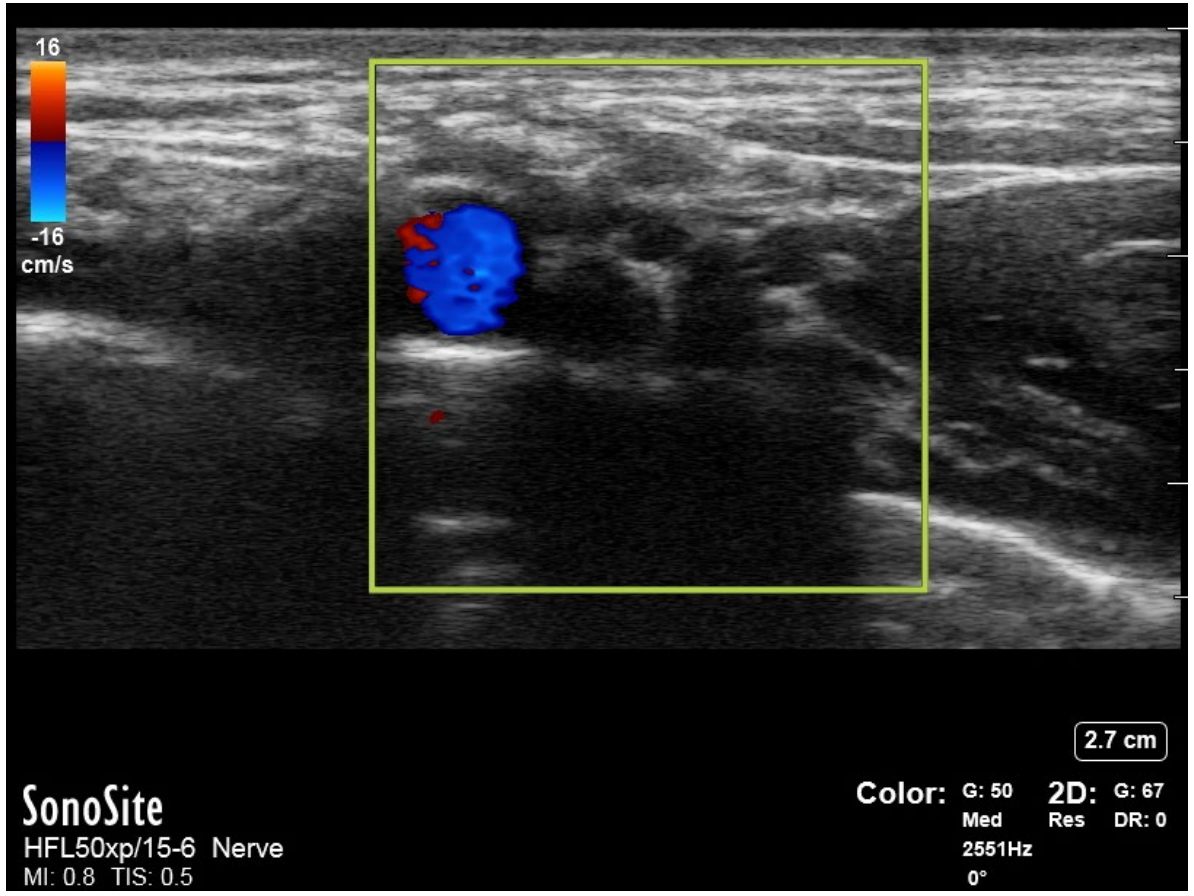
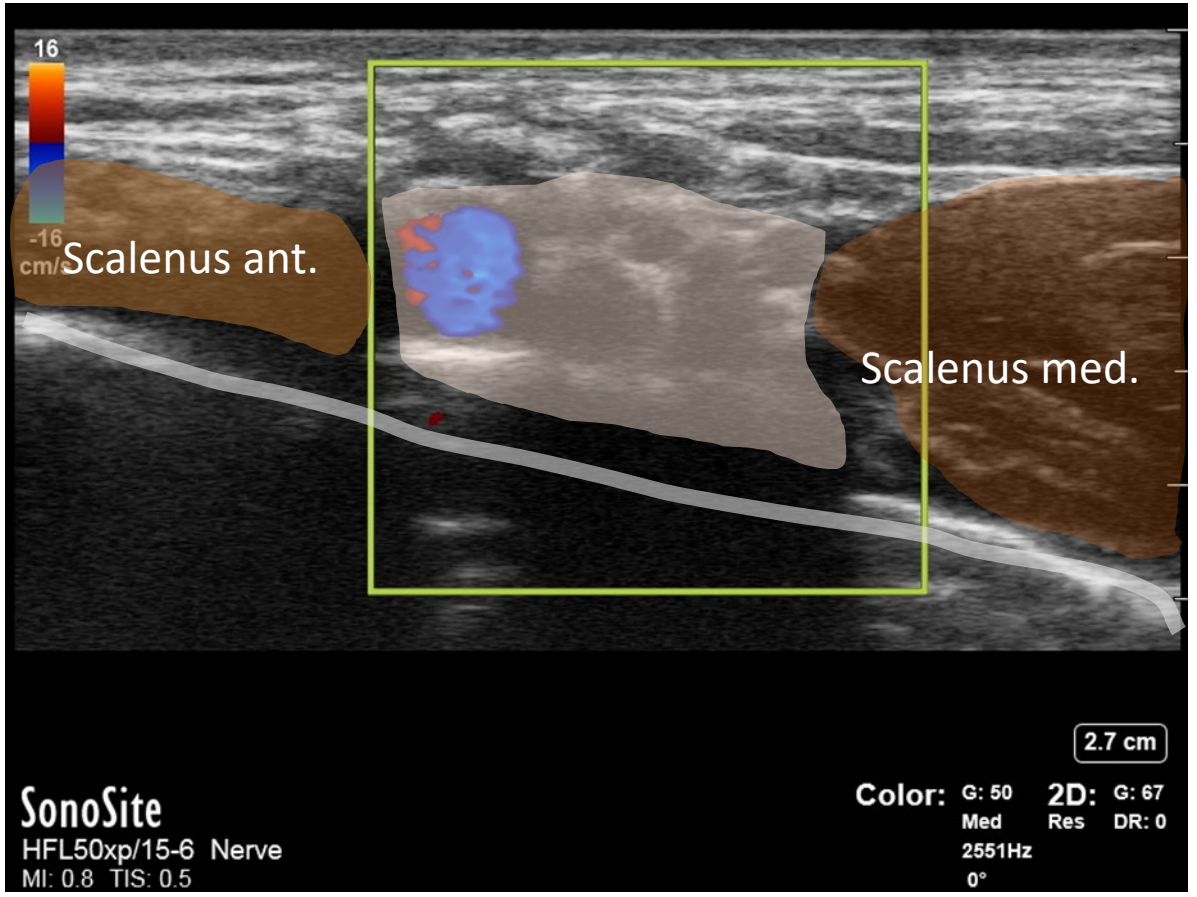


UZ obraz brachiálního plexu nad I. žebrem

Brachiální plexus nad prvním žebrem. Color Doppler





Vaskularizace v pochvě brachiálního plexu.
Nad prvním žebrem bývá plexus rozdělen do dvou částí.

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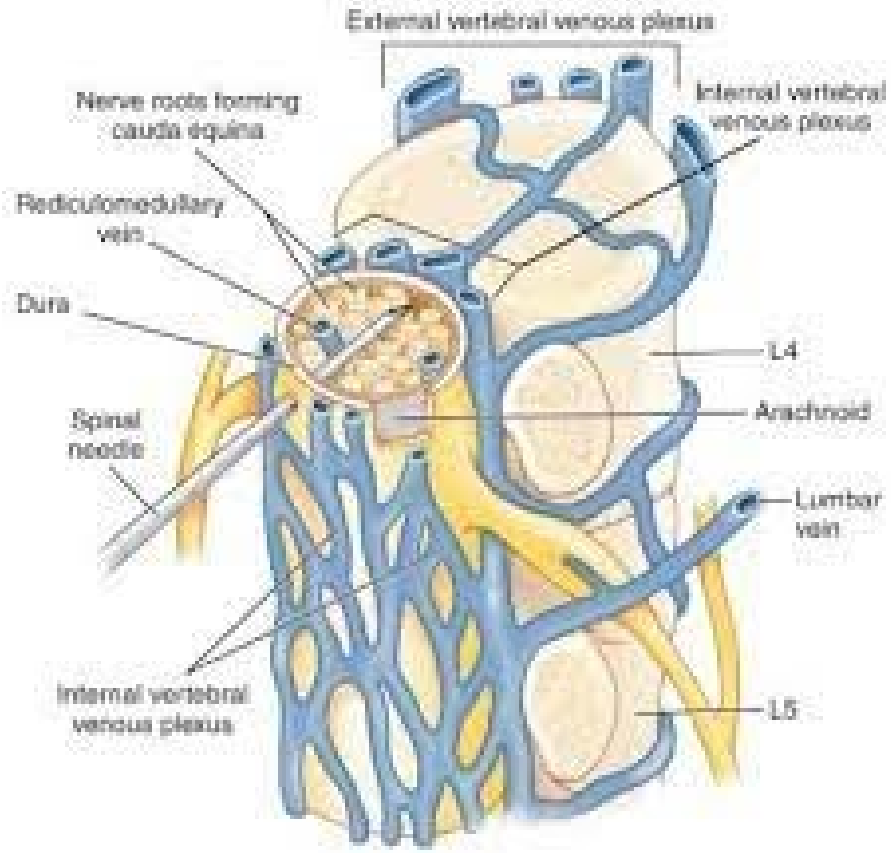
Bloky okolo páteře nejvyšší stupeň opatrnosti

- Epidurální
- Spinální blokáda
- Paravertebrální blok



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Hluboké blokády se zvýšeným rizikem krvácení Břicho, pánev, dolní končetina

- Psoas kompartment blok všechny varianty
- Ischiadicus proximální přístupy (přední, zadní, boční)
- Fascia transversalis
- Quadratus lumborum 1+3 QLB 2 ?
- PENG
- IPEC
- Blok n. pudendus
- Parasakrální blok

Náplň psoatické fascie Psoas compartment block

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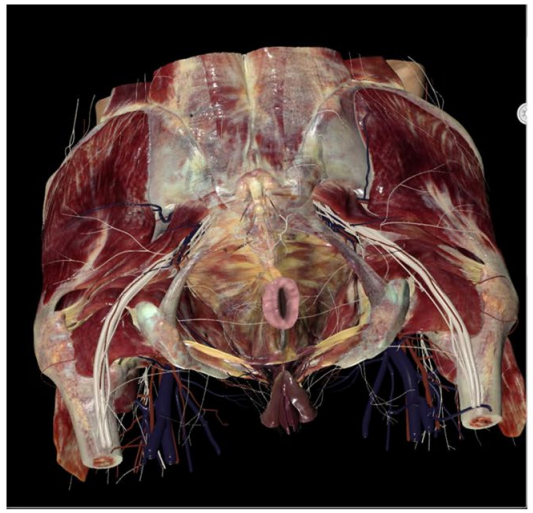
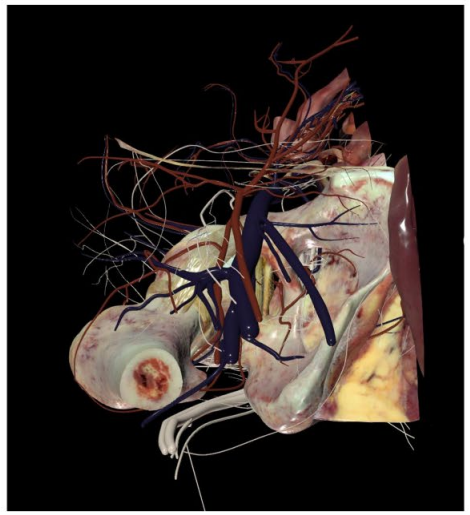
Lower limb, back	Lumbar plexus Psoas compartment Lumbar sympathectomy Lumbar paravertebral Quadratus lumborum Fascia transversalis Sacral plexus Pericapsular nerve group (PENG) Sciatic (proximal approaches) Spinal Epidural Lumbar paravertebral	Femoral Femoral triangle Adductor canal Sciatic (subgluteal, popliteal level) Fascia iliaca Lateral cutaneous nerve of the thigh Femoral branch of genitofemoral nerve Sural, saphenous, tibial, peroneal (deep, superficial)

Nervus pudendalis algezilogická indikace

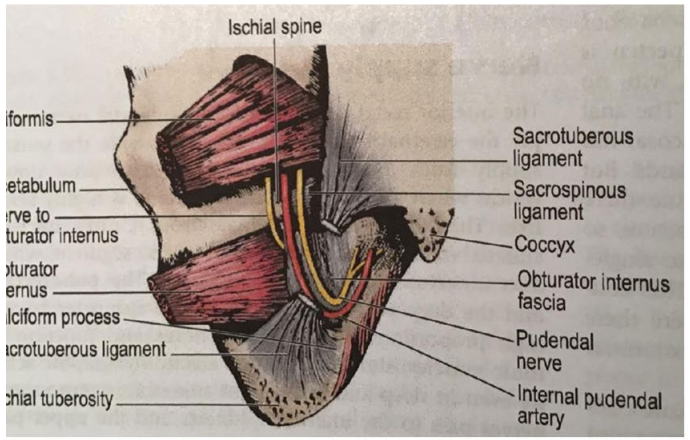
splňuje kritéria: je umístěn hluboko provázen cévami a oblast nelze tamponovat tlakem

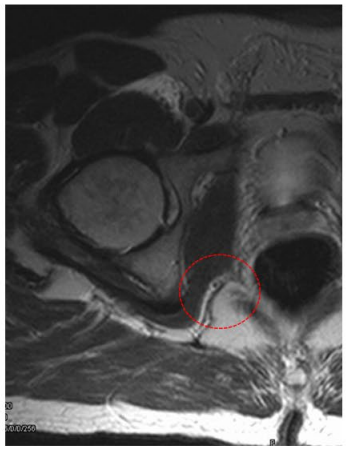
Zadní a spodní pohled na tuberositas ischii



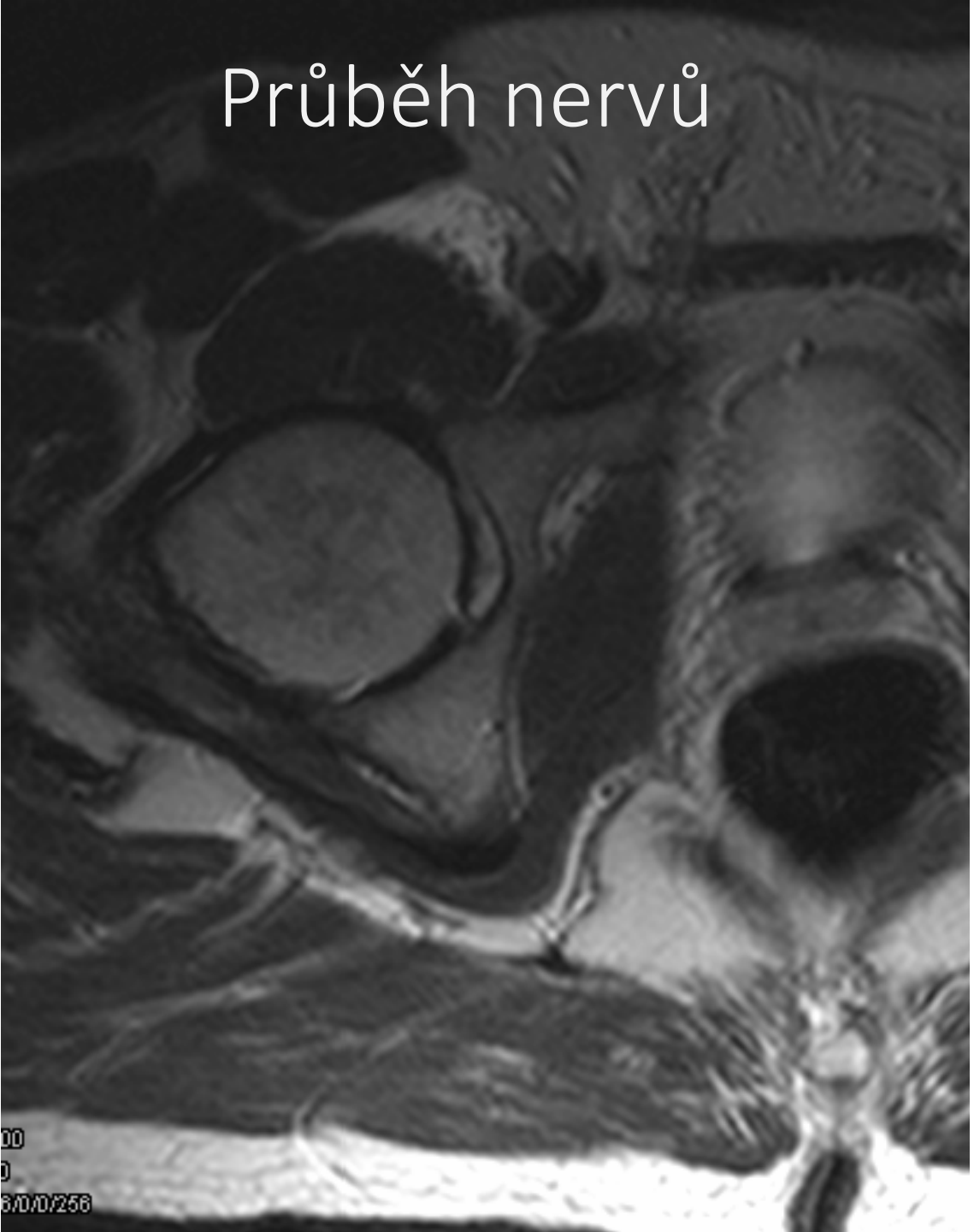


Nervus pudendus – nerv odvrácené tváře

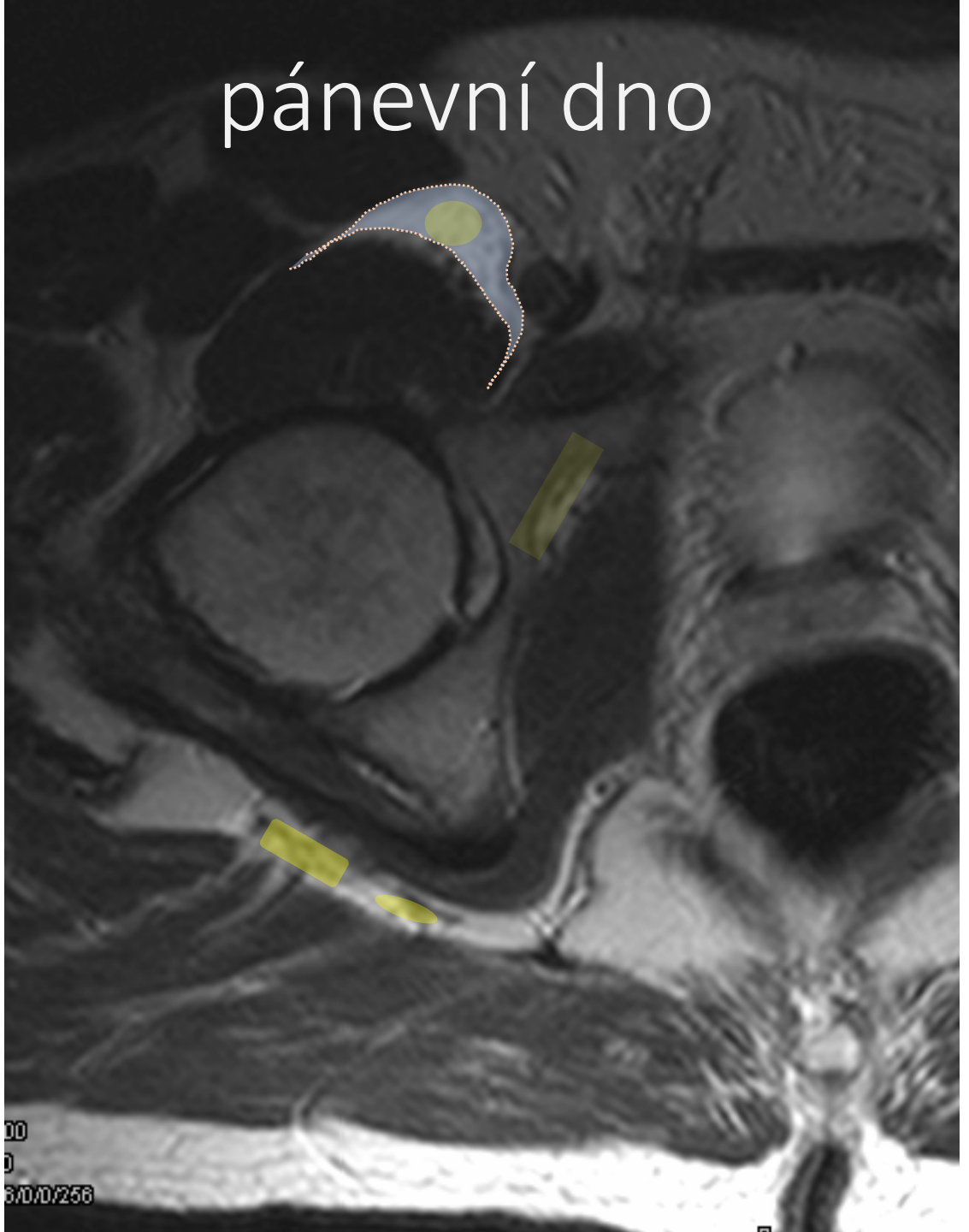




Průběh nervů



pánevní dno



Aplikace analgetické dávky anestetika k a. pudendalis

Matoucí informace v doporučení

Table 2 Categorisation of nerve blocks

	Deep nerve blocks / neuraxial blocks	Superficial nerve blocks
General considerations	Consequence of block-induced bleeding is clinically significant, and may be catastrophic. Management of bleeding complications is difficult because site may be deep and/or noncompressible. Invasive intervention (surgical control) may be required. Clinical consequence: Withdrawal of antithrombotic drugs for block-dependent bleeding risk reduction is recommended (Table 3).	Consequence of block-induced bleeding with superficial haematoma is of less clinical significance. Management of bleeding complications is easy, at compressible location, less likely to require invasive intervention to correct. Clinical consequence: Withdrawal of antithrombotic drugs for block-dependent bleeding risk reduction is not compulsory (Table 4).
Examples for blocks		
Head, neck	Stellate ganglion Deep cervical plexus Cervical paravertebral	Occipital Peribulbar Sub-Tenon's Superficial cervical plexus
Upper limb	Infraclavicular	Interscalene Supraclavicular Axillary Suprascapular Ulnar, radial, medial (forearm or wrist level)
Thorax	Epidural Thoracic paravertebral	Parasternal intercostal plane (deep, superficial) Serratus anterior (deep, superficial) Erector spinae plane Intercostal Interpectoral plane and pecto-serratus plane
Abdomen, pelvic		Ilioinguinal Iliohypogastric Transversus abdominis plane (TAP) Rectus sheath Genital branch of genitofemoral nerve Pudendal nerve
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Riziko krvácení v průběhu n. ischiadicus

Embryologie:
Původní cévní zásobování dolní končetiny bylo cestou ischiadických cév. (nižší obratlovci) Individuálně přetrvává silné cévní zásobení.

Hematom ve stehně po infragluteální blokádě ischiadického nervu

Technické „neověřené“ rady

- Používat tupé jehly
- Separace tkání nízkým tlakem

Co je opravdu důležité

- Konzervativní klinický odhad.
- Nepotkat černou labuť.
- Nabýt v rozporu s

Děkuji za pozornost

Režimy dávkování protisrážlivých léků

- Léčebné dávkování
- Preventivní dávkování
- Většina moderních léků nemá specifické antidotum.

- Background: Management of peri-operative bleeding is complex and involves multiple assessment tools and strategies to ensure optimal patient care with the goal of reducing morbidity and mortality. These updated guidelines from the European Society of Anaesthesiology and Intensive Care (ESAIC) aim to provide an evidence-based set of recommendations for healthcare professionals to help ensure improved clinical management.

- Design: A systematic literature search from 2015 to 2021 of several electronic databases was performed without language restrictions. Grading of Recommendations, Assessment, Development and Evaluation (GRADE) was used to assess the methodological quality of the included studies and to formulate recommendations. A Delphi methodology was used to prepare a clinical practice guideline.

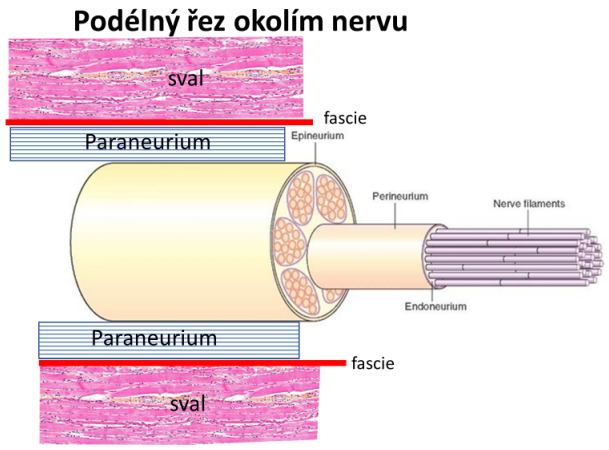
- Results: These searches identified 137 999 articles. All articles were assessed, and the existing 2017 guidelines were revised to incorporate new evidence. Sixteen recommendations derived from the systematic literature search, and four clinical guidances retained from previous ESAIC guidelines were formulated. Using the Delphi process on 253 sentences of guidance, strong consensus (>90% agreement) was achieved in 97% and consensus (75 to 90% agreement) in 3%.

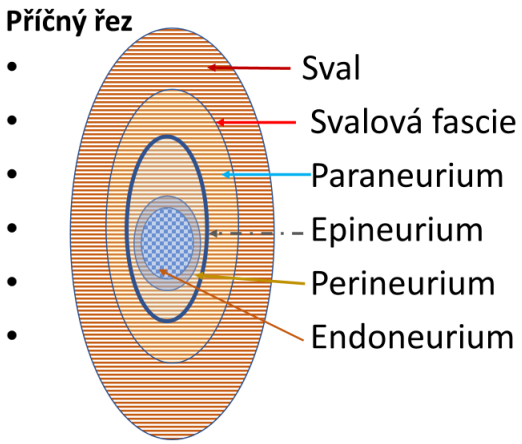
- Discussion: Peri-operative bleeding management encompasses the patient's journey from the pre-operative state through the postoperative period. Along this journey, many features of the patient's pre-operative coagulation status, underlying comorbidities, general health and the procedures that they are undergoing need to be taken into account. Due to the many important aspects in peri-operative nontrauma bleeding management, guidance as to how best approach and treat each individual patient are key. Understanding which therapeutic approaches are most valuable at each timepoint can only enhance patient care, ensuring the best outcomes by reducing blood loss and, therefore, overall morbidity and mortality.

- Conclusion: All healthcare professionals involved in the management of patients at risk for surgical bleeding should be aware of the current therapeutic options and approaches that are available to them. These guidelines aim to provide specific guidance for bleeding management in a variety of clinical situations.

Paraneurální pochva brachiálního plexu

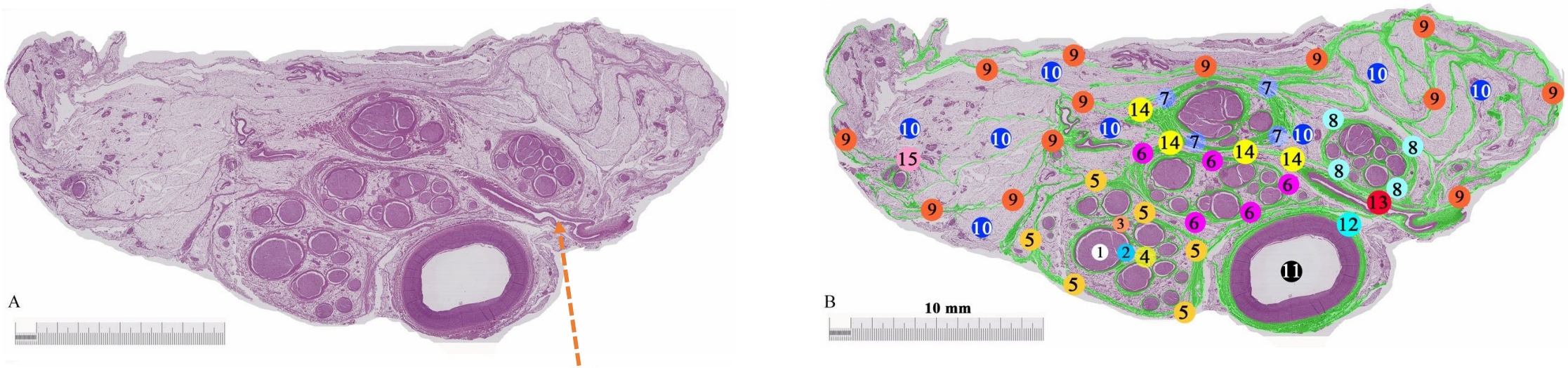
Základem je mnohavrstvá teleskopicky uspořádaná síť kolagenních vláken. Paraneurální kolagenní síť obaluje nejen nervový plexus ale i arterii a přechází do adventicie žil a spolu vytváří fibrózně tukový útvar.





Paraneurální pochva brachiálního plexu

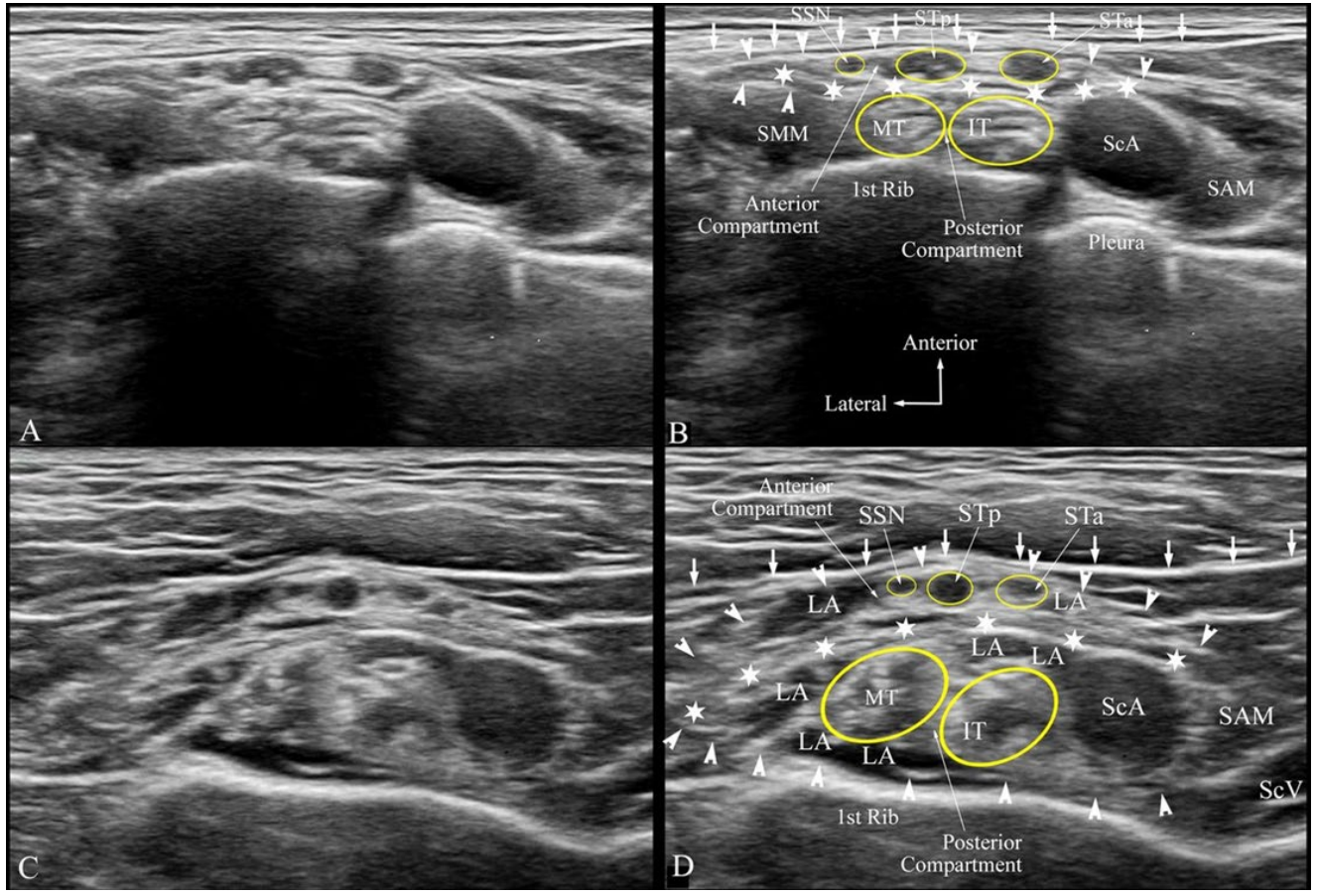
Mnohočetné kolagenní vrstvy lze pozorovat i mezi jednotlivými skupinami nervů, které jsou viditelné v ultrazvukovém obraze.

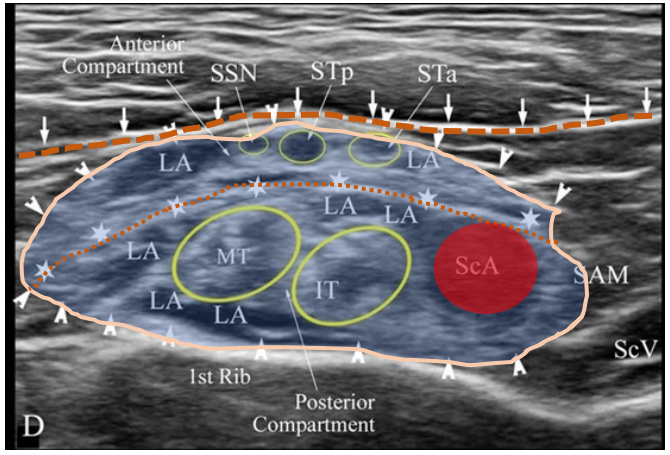


(1) Axon s endoneuriem, (2) perineurium, (3) cirkumfascikulární fibro kolagení vrstva, (4) interfascicularní pojivová tkáň, (5) epineurium inferiorního trunku, (6) epineurium středního trunku, (7) epineurium posteriorní division superiorního trunku, (8) epineurium anteriorní části superiorního trunku, (9) paraneural sheath, (10) adipocyty, (11) a. subclavia, (12) adventitia of the subclavian artery, (13) subclavian vein, (14) septum, (15) suprascapular nerve.

Brachiální plexus v oblasti I. žebra
obraz před aplikací (A, B) a po aplikaci LA (C, D)

bílé šipky představují scalenickou fascii
bílé hlavičky šipek Paraneurium
bílé hvězdičky septum





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PODCAST

GUIDELINES

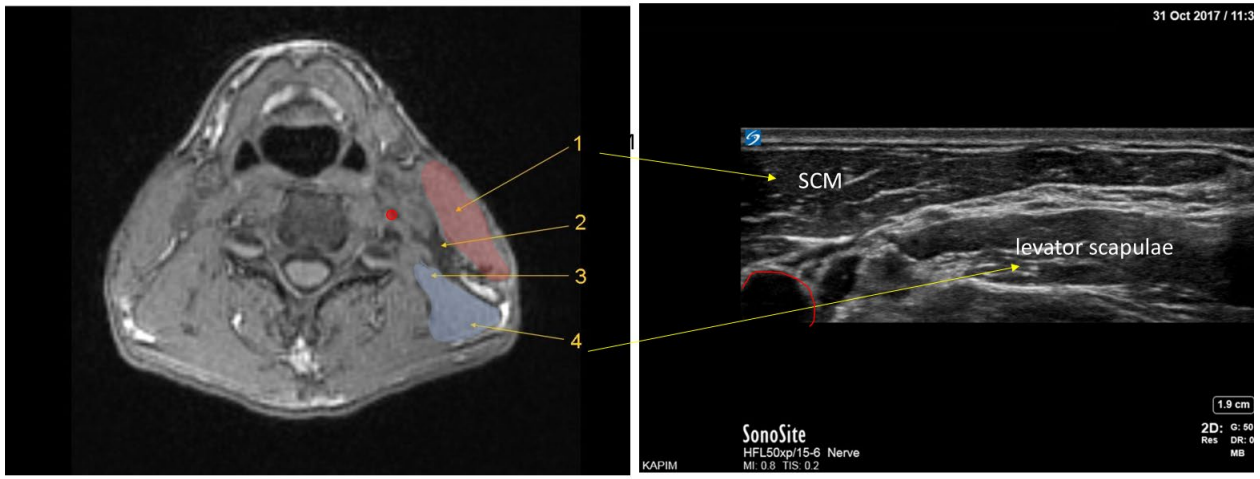
Regional anaesthesia in patients on antithrombotic drugs

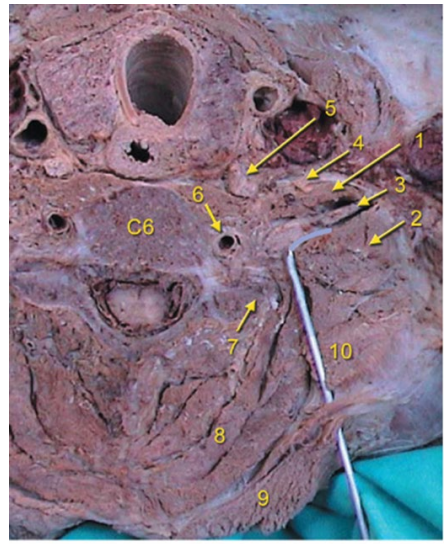
Joint ESAIC/ESRA guidelines

Sibylle Kietaibl, Raquel Ferrandis, Anne Godier, Juan Llau, Clara Lobo, Alan JR Macfarlane, Christoph J. Schlimp, Erik Vandermeulen, Thomas Volk, Christian von Heymann, Morné Wolmarans and Arash Afshari

Hlava, krk

- Blok ggl. stelatum
- Hluboký blok cervikálního plexu (Pippa) je blok brachiálního plexus
- Krční paravertebrální blok
- Bloky okolo prvního žebra (infra i supraklavikulární)





Source: Hadzic A: *The New York School of Regional Anesthesia Textbook of Regional Anesthesia and Acute Pain Management:* http://www.accessanesthesiology.com