Invited speakers

SP1 FASCIAL PLANE BLOCKS: GAME CHANGERS IN PAEDIATRIC ANAESTHESIA

Can Aksu. *Kocaeli University of Medicine, Anesthesiology and Reanimation, Kocaeli, Turkey*

10.1136/rapm-2022-ESRA.1

The first significant cornerstone of regional anesthesia, which has led to its widespread use, is the clinical utilization of ultrasound in block applications. Moreover, many different fascial plane block techniques have been described in parallel with the progress in knowledge in sonoanatomy and the success of the previously defined methods. It could be said that the next big step, especially for 'pediatric regional anesthesia', is the implementation of fascial plane blocks in daily practice.

Caudal block has long been the most applied technique for the pediatric age group. However, as known, the limited indications of caudal blocks along with the refrained complication profile make clinicians hesitate. So the clinical practice was limited to some classic best-known techniques and some experienced practitioners. Unfortunately, it is a well-known fact that 80% of pediatric patients undergoing surgery experience postoperative pain due to inadequate analgesia, and this undertreatment could lead to the development of chronic pain.[1] A multicentric study showed that chronic pain could be seen up to 6.6% after common surgeries in pediatrics.[2] With the introduction of 'Fascial Plane Blocks' into the practice, the clinicians started to have many options for daily cases. The simplicity, safety, and ease of the learning curve of these techniques make them find their place in current practice. Fascial plane blocks provide new avenues for delivering opioid-sparing analgesia while minimizing invasiveness and risks associated with older techniques. They are safe and effective options for treating acute postoperative pain and for both the treatment and prevention of chronic pain in infants and children.

Transversus abdominis plane(TAP) block might be the first 'game-changer', but now the trend is going on with multiple novel fascial plane blocks covering various sensory distributions. However, the data about these blocks are limited, and the debate about their efficacy continues.

REFERENCES

1. Boric K, Dosenovic S, Jelicic Kadic A, *et al*. Interventions for postoperative pain in children: An overview of systematic reviews. *Pediatr Anesth* 2017;27:893–904. https://doi.org/10.1111/pan.13203
2. Mossetti V, Boretsky K, Astuto M, *et al*. Persistent pain following common outpatient surgeries in children: A multicenter study in Italy. *Pediatr Anesth* 2018;28:231–236.

SP2 PDPH IN NON-OBSTETRIC POPULATION. A PROBLEM OR MYTH?: MYTH

Can Aksu. *Kocaeli University of Medicine, Anesthesiology and Reanimation, Kocaeli, Turkey*

10.1136/rapm-2022-ESRA.2

In 1885, Dr. JL Corning[1] wrote the first paper about spinal anesthesia and said, 'Whether the method will ever find an application as a substitute for etherization in genito-urinary or other branches of surgery, further experience alone can show'. He might have been defined the very first post-dural puncture headache (PDPH) in that first report of the spinal anesthesia application, instead of August Bier. In 1956 it was reported that the incidence of PDPH was varied between 15% to 46%.[2] And current reports show that the incidence of unintended dural puncture (DP) is between 0,16%-1,3%, and the incidence of PDPH after DP ranges between 16% to 86%.[3] This means that the 'so-called problem' occurred in 0,02%-1,1% of the patients. But is this a problem or a complication that can be overcome?

It is known that the development of PDPH depends on several factors related to the patient, the technique, and the needle type.[4] Pirbudak et al.[5] showed that the physician's experience and physical state/fatigue are strongly correlated to the incidence of PDPH along with other well-known factors. So this leads us to think that 'the problem' is not PDPH itself, but might be the lack of experience, lack of knowledge for both prevention and treatment, and improper technique or needle.

Today, when we search for 'spinal anesthesia' on Pubmed, nearly 28000 results can be found. Some of these are about the complications like PDPH, but most are about the benefits of the technique. One way or other, since its first definition, the technique has found its place in daily clinical practice as a standard procedure. I have two questions: If PDPH is a real problem, why do the clinicians continue to perform spinal anesthesia. And is it really a problem, as there are many solutions?

REFERENCE

1. Corning JL. Spinal anaesthesia and local medication of the cord. *New York Medical Journal* 1885;42:483–5.
2. Rosedale N. Lumbar puncture headache in relation to age of patient and rest after puncture. *Br J Vener Dis* 1956;32:127–8.
3. Giaccari LG, Aurilio C, Coppolino F, *et al*. Peripheral Nerve Blocks for Postdural Puncture Headache: A New Solution for an Old Problem?. *In vivo* 2021;*35*:3019–29
4. Patel R, Urits I, Orhurhu V, *et al*. A Comprehensive Update on the Treatment and Management of Postdural Puncture Headache. *Curr Pain Headache Rep* 2020;24:24.
5. Pirbudak L, Ozcan HI, Tumturk P. Postdural puncture headache: incidence and predisposing factors in a university hospital. *Agri* 2019;31:1–8.

SP3 BEST RA TECHNIQUE FOR ANKLE AND FOOT AMBULATORY SURGERY

Alain Delbos. *Department of Anesthesia, Medipole Garonne, Toulouse, France*

10.1136/rapm-2022-ESRA.3

Peripheral nerve blocks are highly effective anaesthesia and analgesia technique with low technical risk for ankle and foot surgery, They are appropriate and convenient technique for Ankle and foot Ambulatory surgery.

Depending of the tourniquet positioning the anaesthesia of the Ankle and foot can be organized using proximal or distal block. Proximal blocks are necessary when using a thigh tourniquet and distal blocks are efficient when using an ankle tourniquet.

1. Thigh tourniquet with proximal blocks for ankle and foot surgery.

   Using a thigh tourniquet, a sciatic and femoral nerve blocks should be performed.[2]

   1–1 Femoral nerve block:

   When using an in plane technique, the puncture site is located at the outer lateral end of the probe. Advance the needle parallel to the long axis of the probe in the same plane as the ultrasound beam in the direction of the femoral

nerve, lateral to the femoral artery. When the tip of the needle crosses both fascia lata and iliaca, a typical click can be perceived and confirmed on the screen. Once the needle is adjacent to the nerve, inject 15–20 ml of local anaesthetic. At this level, before separating, the saphenous nerve, its terminal branch, is usually situated on the anterior and medial surface of the femoral nerve. The femoral nerve block allowing to anesthetize the saphenous nerve also gives an anaesthesia at the medial part of ankle and foot. The saphenous nerve is also an important contributor to postoperative pain after major ankle surgery.[3]

1–2 Sciatic nerve block:

Because of its widespread use for ankle and foot surgery and its excellent visualization, the sciatic nerve block is one of the most commonly lower limb nerve block performed under US guidance. The lateral approach allows an optimal visualization of the needle during its entire travel to the nerve.

When using an in plane approach, the puncture site is located at the outer lateral end of the probe. Insert the needle then advance towards the sciatic nerve performing a Subgluteal or a Popliteal nerve block.

When performing a popliteal nerve block using an in plane technique (supine), identify the needle tip and direct the needle medially between biceps femoris and vastus lateralis muscles and then through the biceps femoris towards the sciatic nerve. Position the needle either deep or superficial, close to the nerve; avoid direct contact with the nerve. Inject local anaesthetic and observe spread.

When 15–20 mL is injected, a circumferential or extensive, close to the nerve, proximal spread of the local anaesthetic solution is noted in most patients, resulting in a subparaneural injection allowing in a rapid and complete anaesthesia of the foot. There appears to be a distinct fascial covering around the nerve[4] if the needle is beneath this layer a small volume 10–15 ml will be sufficient to obtain a spread of local anaesthetic around or close to the nerve.[5]

1–3 The main Indications are:

• In combination with femoral nerve block:

- Anaesthesia for leg, ankle and foot surgery with thigh tourniquet

• Well adapted to ambulatory surgery

• Post-operative analgesia

- After ankle or foot surgery

• In trauma situations

- Anaesthesia and Analgesia for leg, ankle and foot trauma.

2 – Ankle tourniquet with distal blocks for foot surgery.

Ankle blocks can be used only with an ankle tourniquet, the most often for middle and forefoot surgery.

Ankle blocks allows safe and long duration analgesia and anesthesia while providing quick mobilization.[6]

2–1 The innervation of the foot is provided by:[7]

- The terminal branch of the femoral nerve: the saphenous nerve

- The two terminal branches of the sciatic nerve

• Common peroneal nerve

- The common peroneal nerve divides into

• Deep peroneal nerve

• Superficial peroneal nerve

• Tibial nerve

- The tibial nerve innervates a large portion of the foot.

- At the popliteal fossa, a sensitive nerve branch emerges from the tibial nerve: the sural nerve

2–2 The main indication Indications[8] are:

• Foot surgery without tourniquet

• Foot surgery with ankle tourniquet for short procedures

• Post-operative analgesia

• Complementary blocks in case of more proximal failure

2–3 Block Technique

Tibial nerve block Insert the needle at the outer posterior or anterior end of the ultrasound probe, and advance it parallel to the long axis of the probe in the same plane as the ultrasound beam in the direction of the tibial nerve which is usually adjacent to the tibial artery.

Inject 5–8 ml of local anaesthetic.

The tibial nerve block provides an anaesthesia of the plantar area of the foot.

Deep peroneal nerve block Insert the probe transversely on the anterior aspect of the tibia.

Identify the Extensor hallucis longus tendon medially, the Extensor digitorum longus tendon laterally and Anterior tibial artery lying at the anterior surface of the tibia.

Insert needle perpendicular to the skin in direction to the nerve lying just lateral or medial to the anterior tibial artery.

The Deep peroneal nerve block provides an anaesthesia to the bones of the dorsal part of the

Foot and a small cutaneous area between the first and second toes.

Superficial peroneal nerve • Position the probe on the lateral aspect of the lower leg proximal to the fibula. The superficial peroneal nerve lies between the extensor digitorum longus and peroneus brevis muscles just beneath the fascia lata.

• Inject 3–5 ml of local anesthetic surrounding or close to the nerve.

• The superficial peroneal nerve block provides an anaesthesia to the skin of the dorsal part of the foot, excluding the fifth toe and the first interdigital space

Sural nerve • The probe is positioned, on the posterolateral aspect of the Achille's tendon. Identify the short saphenous vein lying superficially between the Achilles' tendon and the peroneus brevis muscle.

The sural nerve block provides an anaesthesia to the lateral part of the dorsum of the foot including the fifth, fourth and often the third digit.

Saphenous nerve Place the probe transversally just proximal and anterior to the medial malleolus, then identify the great saphenous vein.

Inject 2to 3 ml of local anaesthetic on both sides of the saphenous vein.

• Anaesthesia of the medial part of the ankle and foot.[8]

2–4 Local anaesthetics solution[9]:

- Short procedure:

• Lidocaine 1% +/- epinephrine

• Mepivacaine 1%+/- epinephrine

- Long procedure or for postoperative analgesia :

• Bupivacaine or L-Bupivacaine 0,25%+/- epinephrine

• Ropivacaine 0,375%

Conclusion Proximal blocks are highly efficient when using a thigh tourniquet. They are appropriate and convenient technique for Ankle and foot Ambulatory surgery.

Ankle blocks are very selective nerve blocks, with low risk technique[1] . They must be used ''in combination'' for total anaesthesia of the foot. These nerves are easily identified and blocked with a low dose of local anesthetics and lead to rapid patient mobilization and discharge.

REFERENCES

1. Kahn RL, *et al*. The Incidence of Complications Is Low Following Foot and Ankle Surgery for Which Peripheral Nerve Blocks Are Used for Postoperative Pain Management. *HSS J* 2018; **14**(2):134–142.

2. Gianakos AL, *et al.* Combination Lower Extremity Nerve Blocks and Their Effect on Postoperative Pain and Opioid Consumption: A Systematic Review. *J Foot Ankle Surg*,2021; **60**(1):121–131.
3. Bjorn S, *et al.* The Importance of the Saphenous Nerve Block for Analgesia Following Major Ankle Surgery: A Randomized, Controlled, Double-Blind Study. *Reg Anesth Pain Med*,2018; **43**(5):474–479.
4. Karmakar MK, *et al.* Ultrasound-guided subparaneural popliteal sciatic nerve block: there is more to it than meets the eyes. *Reg Anesth Pain Med* 2021; **46**(3):268–275.
5. Techasuk W, *et al*. Minimum effective volume of combined lidocaine-bupivacaine for analgesic subparaneural popliteal sciatic nerve block. *Reg Anesth Pain Med* 2014; **39**(2):108–11.
6. Korwin-Kochanowska K, *et al*. PROSPECT guideline for hallux valgus repair surgery: a systematic review and procedure-specific postoperative pain management recommendations. *Reg Anesth Pain Med* 2020; **45**(9):702–708.
7. Delbos A, *et al*. Ultrasound-guided ankle block. History revisited. *Best Pract Res Clin Anaesthesiol* 2019; **33**(1):79–93.
8. Lopez AM, *et al*. Ultrasound-guided ankle block for forefoot surgery: the contribution of the saphenous nerve. *Reg Anesth Pain Med* 2012; **37**(5):554–7.
9. Marty P, *et al*. Perineural Versus Systemic Dexamethasone in Front-Foot Surgery Under Ankle Block: A Randomized Double-Blind Study. *Reg Anesth Pain Med* 2018; **43**(7):732–737.

SP4 INFUSION THERAPIES IN CHRONIC HEADACHE

Magdalena Anitescu. *Professor of Anesthesia, University of Chicago, Chicago, IL USA*

10.1136/rapm-2022-ESRA.4

Headaches are widely prevalent, as more than 50% of the general population will develop headache within a year. Furthermore, headache has a 90% lifetime history in the world population. However, only 3% of population would develop chronic headache. Many treatments do exist that are very effective in reducing headaches. This presentation will discuss infusion therapies, treatment modalities that are less common but very effective in intractable chronic headache conditions. In addition to presentations of current dihydroergotamine and valproate infusion protocols, we will also introduce magnesium as an essential element that, when administered intravenously, can decrease headaches. Additionally, this presentation will describe indications for lidocaine and ketamine infusions to improve pain from intractable chronic headaches.

SP5 RADIOFREQUENCY ABLATION OF VERTEBRAL BODY METASTASES

Magdalena Anitescu. *Professor of Anesthesia, University of Chicago, Chicago, IL, USA*

10.1136/rapm-2022-ESRA.5

Vertebral compression fractures occur due to osteoporosis or malignancy. Diagnosis is best done clinically and by MRI, CT. Most common malignancies associated with vertebral body metastases are breast, lung, prostate cancers. Multiple myeloma is in a special situation as over 70% of patients do have bone pain at diagnosis and about 55–70% have a history of vertebral body abnormalities. In the presence of the vertebral body metastases, back pain is prevalent. The common treatment of vertebral body malignant lesion is a vertebral augmentation procedure that is coupled with radiofrequency ablation of the identified metastases.

In this presentation we will discuss effectiveness of this combined technique in improving clinical outcomes by decreasing pain and control local tumor burden in cancer associated metastases of the vertebral body. We will also describe techniques, analyze potential complications, address managing possible adverse events and review the literature on best approach to this complex cancer related condition.

SP6 REGENERATIVE MEDICINE IN CHRONIC PAIN MEDICINE

Magdalena Anitescu. *Professor of Anesthesia, University of Chicago, USA*

10.1136/rapm-2022-ESRA.6

Introduction and history While regenerative medicine may seem like a novel intervention in the chronic pain armamentarium, its evolution and in a sense its definition has been intricately related to the history of humankind.

The first concept of tissue regeneration comes to us from the Greek Mythology in the description of the Prometheus Myths. As such, in Hesiod Theogony, Prometheus is punished by Zeus by being bound to a rock as punishment for gifting humankind the secret of fire; in Aeschylus' tragedy, Prometheus Bound, the god is described as nailed to the mountain of Caucasus while an eagle consumes his immortal liver, which constantly replenishes itself. This description may be the first ever mention of the concept of tissue regeneration and dates back 8–9th century BCE.

In the 4th century BC, Aristotle (384–322BCE), established methods to investigate and reason about the physical world around him and created a school of thought named natural philosophy, later named natural science. Using scientific reasoning, Aristotle attempted a theory on how embryos generate and develop; he believed that an organism develops gradually from undifferentiated material; the science of this process, later called epigenesis, contains elements and concepts of modern regenerative medicine.

Silence on this topic followed for almost 2 millennia until Schwann and Schleiden discussed in 1833 the concept of 'Omnis cellula ex cellula', or, in translation, 'all cells come from cells'; however, it was Virchow who conducted microscopic experiments and provided confirmation of the process of differentiation. His findings are best summarized in his famous quote 'when a cell exists, there must have been a pre-existing cell'.

The 20th and 21st century will see an expansion of these concept in their evolution towards the concept of regenerative medicine therapies.

Regenerative medicine in pain medicine-Definition, Biology

As a modern definition, regenerative medicine represents a type of translational medicine, part tissue engineering, part molecular biology that sits at the intersection of 3 elements: biomaterials, tissue engineering and stem cell therapies. Regenerative therapies do attempt to restore or re-establish normal function through replacing, engineering and regeneration of human cells, tissues, and organs. The most used techniques in pain medicine clinical practice are platelet rich plasma (PRP) therapies and stem cell bone marrow concentrates (BMC) treatments.

As we can see from Figure 1, the natural process of healing in human body does take time; usually after an initial injury, the pro-inflammatory phase lasts about 3–6 days and is followed by a proliferation phase of 4–30 days and a remodeling phase from day 21 to 1 year. Many biological processes do contribute to the activity of healing but using the regenerative therapies with PRP and BMC is believed to accelerate the natural healing cascade by delivering greater than normal concentration of cytokines releasing platelets, pro-inflammatory