(REGIONÁLNÍ) ANALGEZIE PO CÍSAŘSKÉM ŘEZU

MUDr. Jitka Mannová PhD.

Article

The Impact of Combination Therapy Utilizing Citrus limon Aromatherapy and Mozart Classical Music Distraction Therapy to Reduce The Pain Intensity in Post-Sectio Caesarea Mothers

Novi Anggraeni[1], Nurun Nikmah[2], Selvia Nurul Qomari[3]

Prodi Profesi Bidan, STIKes Ngudia Husada Madura, Indonesia

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THE EFFECTIVENESS OF HAND MASSAGE, FOOT MASSAGE AND COMBINATION ON PAIN INTENSITY OF POST SECTIO CAESAREA

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The Effect of Exercise Therapy on Pain in Mothers After Sectio Caesarea

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ERAS doporučení po císařském řezu

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Enhanced Recovery After Surgery to Change Process Measures and Reduce Opioid Use After Cesarean Delivery:

A Quality Improvement Initiative

Monique Hedderson, PhD, Derrick Lee, MD, Eric Hunt, MD, PhD, Kimberly Lee, MD, Fei Xu, MS, Alex Mustille, PhD, Jessica Galin, MPH, Cynthia Campbell, PhD, Charles Quesenberry, PhD, Vivian Reyes, MD, Mengfei Huang, PhD, Barbara Nicol, MD, Shirley Paulson, DNP, MPA, RN, Vincent Liu, MD, MS

Kaiser Permanente Division of Research and the Permanente Medical Group, Oakland, and the Department of Psychiatry, Weill Institute for Neurosciences, University of California, San Francisco, san Francisco California.

The Advantage of Implementation of Enhanced Recovery After Surgery (ERAS) in Acute Pain Management During Elective Cesarean Delivery: A Prospective Randomized Controlled Trial

This article was published in the following Dove Press journal:
Therapeutics and Clinical Risk Management

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Objective: The aim of this study was to test whether the implementation of an enhanced recovery after surgery (ERAS) protocol for patients undergoing elective cesarean delivery has a positive impact on the postoperative status of the patients in terms of pain management, hospital stay, hospitalization costs, and adverse reactions.
Methods: Patients who underwent elective cesarean delivery were randomized into two groups – ERAS group and control group – and the groups were managed with the ERAS protocol and traditional protocol, respectively.
Results: Compared to the control group, the ERAS group had significantly fewer patients with intraoperative nausea, pain of visual analog scale (VAS) scores, and VAS grade >3 during rest in the first 24 h and during motion in the first 24 and 48 h after surgery. There were no intergroup differences in the requirement of extra analgesics, the incidence of vomiting, shivering, hypotension, postoperative nausea, and pruritus. None of the patients in either group had postoperative vomiting. Patient satisfaction rated as per the VAS was significantly higher in the ERAS group than in the control group. The total length of stay, postoperative length of stay, and the cost of anesthesia in both groups were comparable. Further, the average daily hospitalization cost was significantly lower in the ERAS group than in the control group.
Conclusion: The ERAS protocol shows promise and appears to be worthwhile for widespread implementation among patients undergoing elective cesarean delivery; it was found to be beneficial in reducing the postoperative pain, incidence of intraoperative nausea, and average cost of hospitalization and also improved patient satisfaction.
Keywords: enhanced recovery after surgery, ERAS, cesarean delivery, pain

OBSTETRICS

Guidelines for postoperative care in cesarean delivery: Enhanced Recovery After Surgery (ERAS) Society recommendations (part 3)

Check for updates

George A. Macones, MD; Aaron B. Caughey, MD, PhD; Stephen L. Wood, MD; Ian J. Wrench, MB, ChB, PhD; Jeffrey Huang, MD; Mikael Norman, MD, PhD; Karin Pettersson, MD, PhD; William J. Fawcett, MBBS, FRCA, FFPMRCA; Medhat M. Shalabi, MD; Amy Metcalfe, PhD; Leah Gramlich, MD; Gregg Nelson, MD, PhD; R. Douglas Wilson, MD, MSc

ERAS doporučení po císařském řezu (SC)

- **Multimodální analgezie** je klíčová v managementu pooperační bolesti a je spojena s **nízkou frekvencí vedlejších nežádoucích účinků a vede k rychlému pooperačnímu zotavení**

- **Implementace ERAS program** u pacientek po elektivním císařském řezu bylo spojeno s **redukcí spotřeby opioidů**

Obstet Gynecol 2019

TABLE 2
Guidelines for postoperative care in cesarean delivery: Enhanced Recovery After Surgery Society recommendations

Variable	Item	Recommendation: Evidence level	Recommendation: Recommendation grade
Postoperative pathway			
Chewing gum after cesarean section (focused element)	Gum chewing appears to be effective and is low risk. It may be a redundant treatment if a policy for early oral intake is being used. However, it should be considered if delayed oral intake is planned.	Low	Weak
Nausea and vomiting prevention (focused element)	(1) Fluid preloading, the intravenous administration of ephedrine or phenylephrine, and lower limb compression are effective ways to reduce hypotension and the incidence of intraoperative and postoperative nausea and vomiting.	Moderate (multiple interventions)	Strong
	(2) Antiemetic agents are effective for the prevention of postoperative nausea and vomiting during cesarean delivery. Multimodal approach should be applied to treat postoperative nausea and vomiting.	Moderate	Strong
Postoperative analgesia (focused element)	Multimodal analgesia that include regular nonsteroidal antiinflammatory drugs and paracetamol is recommended for enhanced recovery for cesarean delivery.	Moderate	Strong
Perioperative nutritional care (focused element)	A regular diet within the 2 hours after cesarean delivery is recommended.	High	Strong
Perioperative glucose control (focused element)	Tight control of capillary blood glucose is recommended.	Low	Strong
Prophylaxis against thromboembolism (focused element)	(1) Pneumatic compression stockings should be used to prevent thromboembolic disease in patients who undergo cesarean delivery.	Low	Strong
	(2) Heparin should not be used routinely for venous thromboembolism prophylaxis in patients after cesarean delivery.	Low	Weak
Early post–cesarean delivery mobilization (focused element)	Early mobilization after cesarean delivery is recommended.	Very low	Weak
Post–cesarean delivery urinary drainage (focused element)	Urinary catheter should be removed immediately after cesarean delivery, if placed during surgery.	Low	Strong
Postoperative/ postpartum mother pathway			
Discharge counselling (focused element)	Standardized written discharge instructions should be used to facilitate discharge counselling.	Low	Weak

Macones et al. ERAS cesarean: part 3. Am J Obstet Gynecol 2019.

Chronická pooperační bolest po SC

„pain predicts pain“

- Příčina vzniku chronické bolesti je multifaktoriální, jedním z nejdůležitějších faktorů však je výskyt silné bolesti v pooperačním období a doba jejího trvání
- Závažná bolest po SC je udávána u více než 20 % žen
- Efektivní techniky pooperační regionální analgezie mohou vést k redukci chronické pooperační bolesti po SC

EXPERTS' OPINION

Postpartum chronic pain

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Chronická pooperační bolest po SC je popsána u 10 -15 % žen (6-11 % po šesti měsících)

Jedná se o závažný sociálně ekonomický problém

Systémová analgetika

Opioidy

- Silné (morfin, piritramid, fentanyl, sufentanil)
- Slabé (tramadol)
- PCI

NSAID:

- Ibuprofen, diklofenak
- ketorolac

Paracetamol

Neuroaxiální analgezie

- **Spousta studií demonstrovala superiorní analgetický efekt neuroaxiální** (epidurální, subarachnoidální) **opioidní analgezie morfinem** ve srovnání se systémovou aplikací opioidů

- Doporučována jako **preferovaná varianta pooperační analgezie** po císařském řezu u **zdravých** žen

Neuroaxiální opioidy

Použití purifikovaného morfinu neuroaxiálně není příliš preferovanou metodou, protože…..

„Pro riziko pozdního dechového útlumu je po podání

intrathekálního morfinu indikováno pooperační sledování na JIP. „

Neuroaxiální analgezie

Society for Obstetric Anesthesia and Perinatology Consensus Statement: Monitoring Recommendations for Prevention and Detection of Respiratory Depression Associated With Administration of Neuraxial Morphine for Cesarean Delivery Analgesia

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See Editorial, p 330

The majority of women undergoing cesarean delivery in the United States receive neuraxial morphine, the most effective form of postoperative analgesia for this surgery. Current American Society of Anesthesiologists (ASA) and American Society of Regional Anesthesia and Pain Medicine (ASRA) recommend respiratory monitoring standards following neuraxial morphine administration in the general surgical population that may be too frequent and intensive when applied to the healthy obstetric population receiving a single dose of neuraxial morphine at the time of surgery. There is limited evidence to support or guide the optimal modality, frequency, and duration of respiratory monitoring in the postoperative cesarean delivery patient receiving a single dose of neuraxial morphine. Consistent with the mission of the Society for Obstetric Anesthesia and Perinatology (SOAP) to improve outcomes in pregnancy for women and neonates, the purpose of this consensus statement is to encourage the use of this highly effective analgesic technique while promoting safe practice and patient-centered care. The document aims to reduce unnecessary interruptions from respiratory monitoring in healthy mothers while focusing vigilance on monitoring in those women at highest risk for respiratory depression following neuraxial morphine administration. This consensus statement promotes the use of low-dose neuraxial morphine and multimodal analgesia after cesarean delivery, gives perspective on the safety of this analgesic technique in healthy women, and promotes patient risk stratification and perioperative risk assessment to determine and adjust the intensity, frequency, and duration of respiratory monitoring. (Anesth Analg 2019;129:458–74)

„…Většina žen podstupující císařský řez v USA obdrží neuroaxilání morfin, jako nejefektivnější formu pooperační analgezie po císařském řezu…“

Neuroaxiální analgezie

- ULTRA-LOW-DOSE-INTRATHECAL MORPHINE < **0,05 mg**
- ULTRA-LOW-DOSE-EPIDURAL MORPHINE < 1 mg
- LOW-DOSE INTRATHECAL MORPHINE: **0,05 - 0,15 mg**
- LOW-DOSE EPIDURAL MORPHINE: 1 mg - 3 mg

- > 0,15 mg INTRATHECAL MORPHIN
- > 3 mg EPIDURAL MORPHIN

Neuroaxiální analgezie

- Vyšší dávky neuroaxiálního morfinu vedou k delšímu trvání analgezie
- Vyšší dávky neuroaxiálního morfinu zvyšují riziko vedlejšího účinku opioidů – pruritus, nauzea, vomitus
- **Vyšší dávky neuroaxiálního morfinu zvyšují riziko respirační deprese**

- Respirační deprese po intrathekálním podání morfinu:
- **Časná** během 30-90 minut – nepravděpodobná po nízkých dávkách neuroax. morfinu
- **Opožděná** za 6-18 hodin v důsledku rostrálního šíření mozkomíšním mokem (největší deprese po 6,5-7,5 hodinách)

Neuroaxiální morfin

Bezpečnost intrathekálního morfinu:

- Incidence dechové deprese po neuroaxiálním morfinu **0 %-1,3 %** při užití bradypnoe jako kritéria
- Studie posuzující frekvenci respirační deprese po podání nízkých dávek morfinu k analgezii po SC udávaly jen ojedinělé nebo žádné případy respirační deprese

Systematické review 78 článků :

18 452 žen, které obdržely neuroaxiální morfin k analgezii po plánovaném S.C.

- klinicky významná respirační deprese (SpO2 < 90% RR < 8, naloxon, O2 terapie, intubace): 16 případů u 18 452 rodiček
- Incidence 1,63 na 10 000 rodiček

Riziko respirační deprese u zdravých rodiček je extrémně nízké

Neuroaxiální analgezie

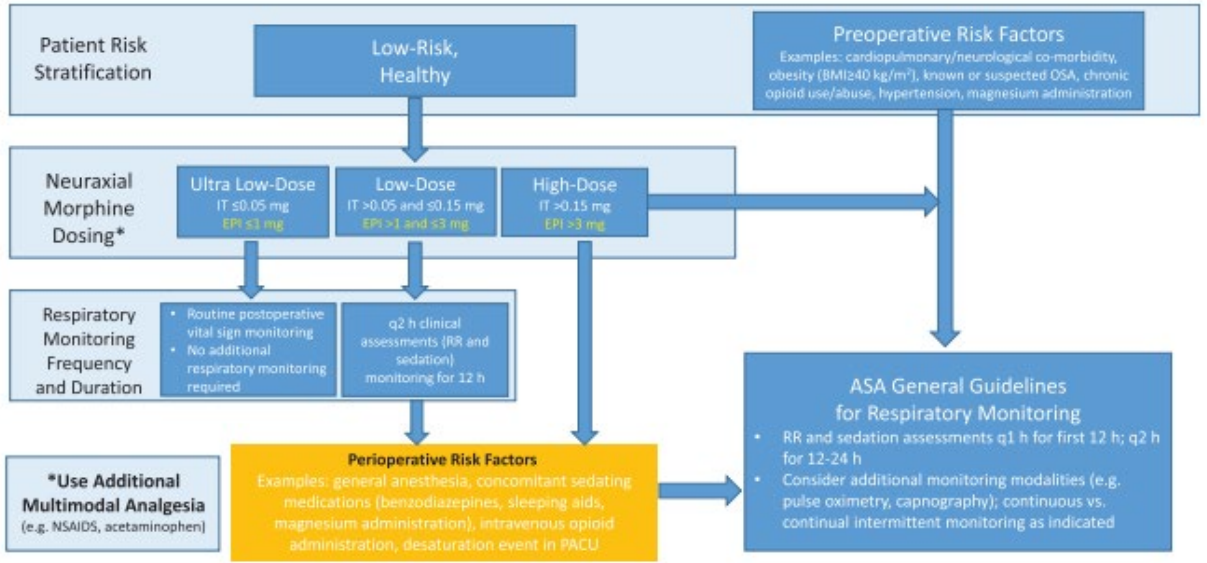


Figure. Respiratory monitoring algorithm following neuraxial morphine administration for postcesarean delivery analgesia. BMI indicates body mass index; EPI, epidural; IT, intrathecal; Mg, magnesium; NSAIDs, nonsteroidal anti-inflammatory drugs; OSA, obstructive sleep apnea; PACU, postoperative anesthesia care unit; Q, every; RR, respiratory rate.

Neuroaxiální analgezie

- **Ultra low dose** intrathekální nebo epidurální morfin u zdravých žen - žádný další monitoring respirační funkcí
- **Low dose** intrathekální nebo epidurální morfin u zdravých žen – á 2 hodiny po dobu 12 hodin kontrola dechové frekvence a stupeň sedace
- **> 0,15 mg subarachnoidálně > 3 mg epidurálně** RR á 1 hodina prvních 12 hodin dále á 2 hodiny dalších 12 hodin event. zvaž další možnosti monitorace (SpO2)

Table 1. Suggested Clinical Decision Tool for Risk Stratification Using Neuraxial Morphine

Risk Factors	Neuraxial Morphine Dose: Intrathecal	Neuraxial Morphine Dose: Epidural	Postoperative Respiratory Monitoring Recommendation
None (healthy, normal BMI)	≤0.05 mg	≤1 mg	No further respiratory monitoring needed in addition to institutional guidelines for postoperative monitoring in this patient population
	>0.05 and ≤0.15 mg	>1 and ≤3 mg	Q 2 h for 12 h RR and sedation checks
	>0.15 mg	>3 mg	Follow ASA/ASRA guidelines[3]: 1. RR and sedation assessments for Q 1 h for first 12 h; Q 2 h for 12–24 h 2. Consider additional monitoring modalities (eg, pulse oximetry, capnography); continuous versus continual intermittent monitoring as indicated
Patient risk factors examples Cardiopulmonary/neurological comorbidity Class III obesity (BMI ≥40 kg/m²) Known or suspected OSA[a] Chronic opioid use Hypertension Peri/postoperative risk factors examples General anesthesia Supplemental IV opioid Concomitant sedating medications[b] Magnesium administration Desaturation event in the PACU	≤0.05 mg	≤1 mg	No further respiratory monitoring needed in addition to institutional guidelines for postoperative monitoring in this patient population
	>0.05 mg	>1 mg	Follow ASA/ASRA guidelines[3]: 1. RR and sedation assessments for Q 1 h for first 12 h; Q 2 h for 12–24 h 2. Consider additional monitoring modalities (eg, pulse oximetry, capnography); continuous versus continual intermittent monitoring as indicated

Abbreviations: ASA, American Society of Anesthesiologists; ASRA, American Society of Regional Anesthesia and Pain Medicine; BMI, body mass index; OSA, obstructive sleep apnea; PACU, postanesthesia care unit; Q, every; RR, respiratory rate; EPI, epidural; IV, intravenous.

[a]All patients with risk factors for OSA (ie, obesity > 30 kg/m², hypertension, etc) should be screened using any or a combination of STOP, STOP-BANG, the ASA checklist, Flemons Index Berlin, or the Epworth Sleepiness Scale.[7-12] Additionally consider these OSA screening questions: BMI > 35 kg/m², falling asleep while talking with someone, and history of treatment for hypertension.[13,14]

[b]Examples include general anesthetics, benzodiazepines, and sedating antiemetics.

Neuroaxiální morfin

Respirační monitoring po analgezii morfinem **u rizikovějších rodiček**:

- SpO2 – kontinuální oxymetrie- ruší rodičky alarmem, často falešným – nevyspání, vyšší riziko nespokojenosti

⟹ Pooperační sledování sestrou – **á 1 hodina po dobu 12 hodin** a následně každé 2 hodiny po dobu dalších 12 hodin

V případě spící rodičky pokud má normální respirační vzorec dýchání při pohledu nebudit

⟹ U více rizikových zvážit pulzní oxymetr

Riziková rodička pro podání intrathekálního morfinu po SC:

- Obezita
- Obstrukční spánková apnoe
- Respirační, kardiální komorbidity
- Preeklampsie a podání MgSO4
- Podání dalších sedativních léků
- Komplikace na dospávacím pokoji

Neuroaxiální morfin

Vedlejší nežádoucí účinky:

Dávka 50 ug intrathekálního morfinu:

- 2,6 % pruritus
- 6,3 % nauzea a zvracení

Dávka 100 ug a více:

- 43 % pruritus
- 10 % nauzea
- 12 % zvracení

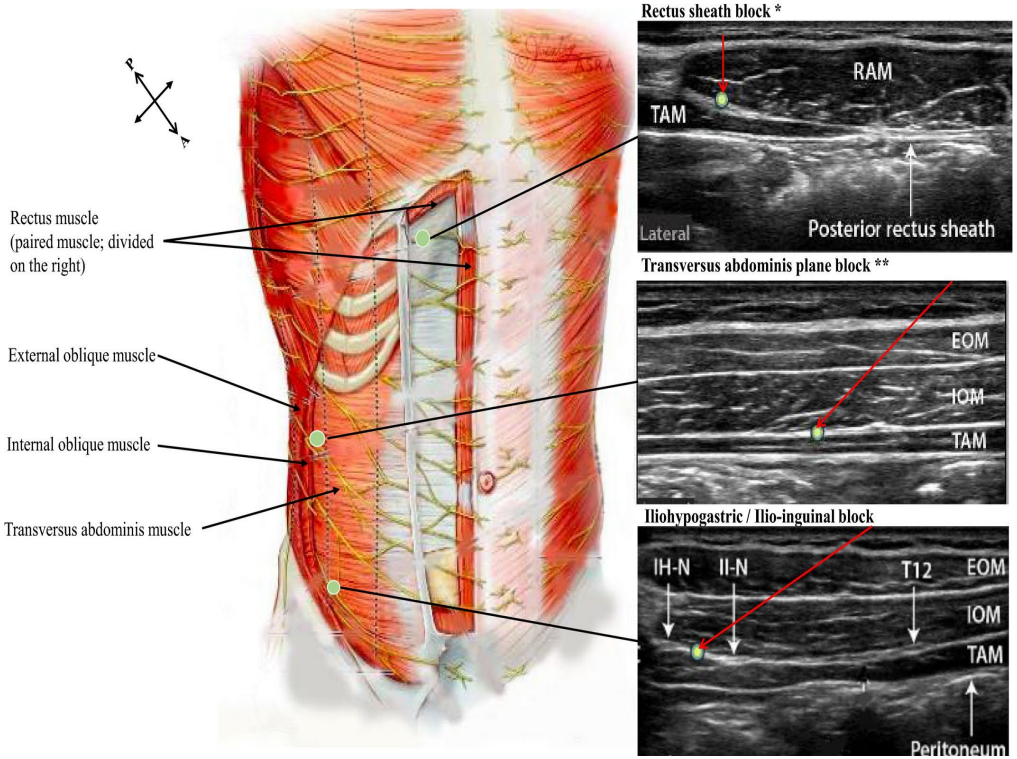
Anaesth Intensive Care 2009

Neuroaxiální morfin

- Nižší dávky neuroaxiálního morfinu – nižší kvalita pooperační analgezie
- **Multimodální analgezie umožňuje snížení dávek neuroaxiálního morfinu**
- Přidání NSAID, paracetamol

- Při použití multimodální analgezie při nízkých dávkách neuroaxiálního morfinu došlo ke snížení potřeby ekvivalentního systémového morfinu o 30 mg během 24 hodin u rodiček
- Neuroaxiání morfin ale ne vždy znamená, že rodička nebude potřebovat opioidní analgezii

TRANSVERSUS ABDOMINIS PLANE BLOCK



UZ navigace

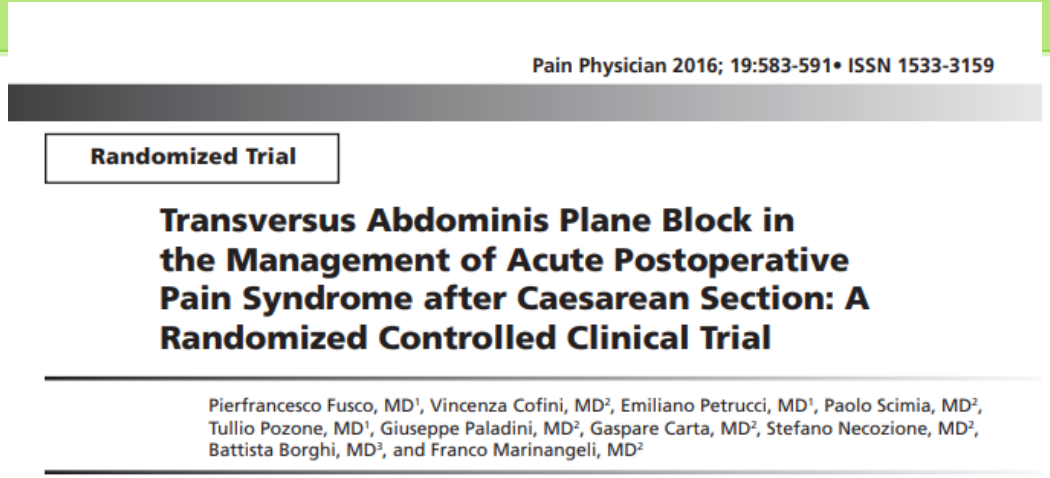
- aplikace LA mezi m. obliquus internus abdominis a m. transversus abdominis
- 20 ml 0,375 % - 0,25 % bupivacainu na každou stranu

nebo 15 ml 0,25 %-0,375 % ropivacainu bilat.

- TAP blok poskytuje efektivní analgezii břišní stěny, ale viscerální bolest vyžaduje doplňkovou analgetickou terapii
- riziko – toxicita LA

TAP blok

TAP blok



Pain Physician 2016; 19:583-591• ISSN 1533-3159

Randomized Trial

Transversus Abdominis Plane Block in the Management of Acute Postoperative Pain Syndrome after Caesarean Section: A Randomized Controlled Clinical Trial

Pierfrancesco Fusco, MD[1], Vincenza Cofini, MD[2], Emiliano Petrucci, MD[1], Paolo Scimia, MD[2], Tullio Pozone, MD[1], Giuseppe Paladini, MD[2], Gaspare Carta, MD[2], Stefano Necozione, MD[2], Battista Borghi, MD[3], and Franco Marinangeli, MD[2]

- TAP blok: 20 ml 0,375% bupivacainu bilat vs. FR
- Paracetamol ve schématu
- Tramadol při VAS > 7

Vyšší spokojenost pacientů byla jednoznačně ve skupině s TAP blokem

TAP blok

Table 3. *Request of pain-killers, during follow-up (consumption in mg)* -

Pain-killer	S group Number of patients (consumption in mg)	C group Number of patients (consumption in mg)	P*
Post-surgery follow-up			
Ketorolac after:			
- 8 hours	20 (600)	41 (840)	0.000
- 12 hours	13 (390)	37 (1110)	0.0000.000
- 24 hours	8 (240)	36 (1080)	0.004
- 48 hours	2 (60)	13 (390)	0.026
- 72 hours	0 (0)	6 (180)	
Acetaminophen after:			
- 8 hours	48 (48000)	48 (48000)	-
- 12 hours	32 (32000)	45 (45000)	0.002
- 24 hours	26 (26000)	47 (47000)	0.000
	-	-	-
	-	-	-
Tramadol after:			
- 8 hours	3 (300)	33 (3300)	0.000
- 12 hours	3 (300)	27 (2700)	0.000
- 24 hours	0 (0)	28 (2800)	-
- 48 hours	0 (0)	5 (500)	-
- 72 hours	-	-	-

*Chi square test or Fisher exact test

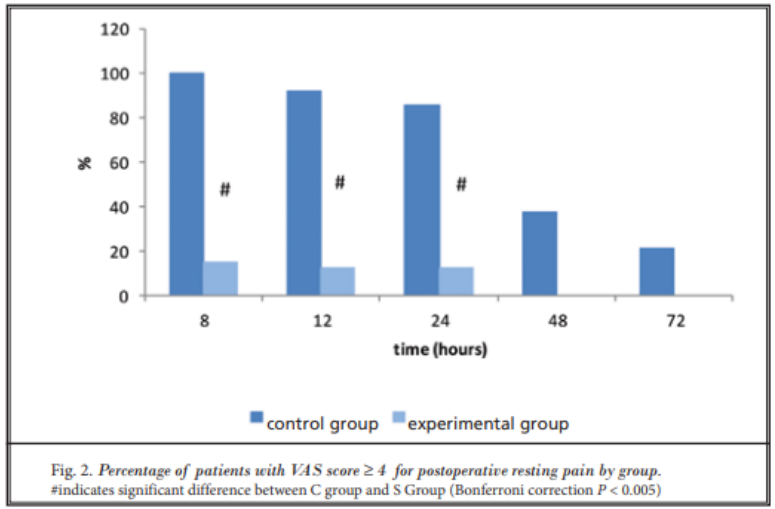
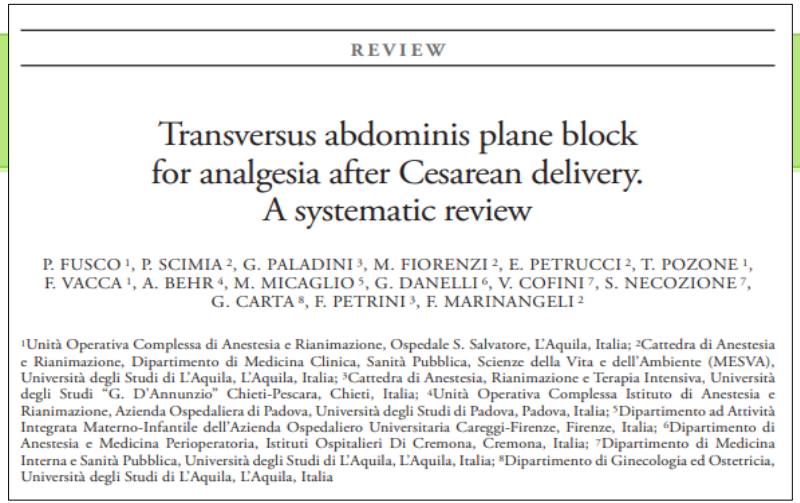


Fig. 2. *Percentage of patients with VAS score ≥ 4 for postoperative resting pain by group.*
#indicates significant difference between C group and S Group (Bonferroni correction $P < 0.005$)

- TAP blok jako součást multimodální analgezie je efektivní v léčbě somatické a viscerální bolesti. **Snižuje spotřebu analgetik a jejich vedlejší nežádoucí účinky** a vylepšuje i benefit-cost ratio

TAP blok



REVIEW

Transversus abdominis plane block for analgesia after Cesarean delivery. A systematic review

P. FUSCO [1], P. SCIMIA [2], G. PALADINI [3], M. FIORENZI [2], E. PETRUCCI [2], T. POZONE [1], F. VACCA [1], A. BEHR [4], M. MICAGLIO [5], G. DANELLI [6], V. COFINI [7], S. NECOZIONE [7], G. CARTA [8], F. PETRINI [3], F. MARINANGELI [2]

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- 11 zahrnutých studií
- **V některých byly podány intrathekálně opioidy** (3x ITF 25-10ug, 4x ITF + ITM)
- Ropivacain 6x Bupivacain 5x pro TAP blok
- Pooperačně PCA s morfinem nebo i.v. opioidy s nebo bez NSAID

- **Spotřeba analgetik a VAS byla snížena u pacientů s TAP blokem v některých studiích**
- **TAP může redukovat pooperační spotřebu opioidů a tím vést ke snížení jejich vedlejších účinků, zlepšuje pooperační kontrolu bolesti a spokojenost pacientů**
- Vyšší spokojenost byla rodiček, které obdržely TAP blok s intrathekálními opioidy

TAP blok

British Journal of Anaesthesia **109** (5): 679–87 (2012)
Advance Access publication 19 August 2012 · doi:10.1093/bja/aes279

BJA

REVIEW ARTICLES

Transversus abdominis plane block for postoperative analgesia after Caesarean delivery performed under spinal anaesthesia? A systematic review and meta-analysis

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Editor's key points

- The utility of transversus abdominis plane (TAP) block in Caesarean delivery was assessed by analysing results of previous studies.
- TAP block reduced i.v. morphine consumption and pain scores in the first day after surgery.
- TAP block can provide effective analgesia after Caesarean delivery when intrathecal morphine has not been used.

Summary. The transversus abdominis plane (TAP) block is a field block that provides postoperative analgesia for abdominal surgery. Its analgesic utility after Caesarean delivery (CD) remains controversial. This systematic review and meta-analysis examines whether TAP block can reduce i.v. morphine consumption in the first 24 h after CD. The authors retrieved randomized controlled trials comparing TAP block with placebo in CD. Postoperative i.v. morphine consumption during the first 24 h was selected as a primary outcome. Pain scores and both maternal and neonatal opioid-related side-effects were secondary outcomes. Where possible, meta-analytic techniques and random effects modelling were used to combine data. Trials were stratified based on whether or not spinal morphine was used as part of the analgesic regimen. Five trials including 312 patients were identified. TAP block reduced the mean 24 h i.v. morphine consumption by 24 mg [95% confidence interval (CI) −39.65 to −7.78] when spinal morphine was not used. TAP block also reduced visual analogue scale pain scores (10 cm line where 0 cm, no pain, and 10 cm, worst pain) by 0.8 cm (95% CI −1.53 to −0.05, P=0.01), and decreased the incidence of opioid-related side-effects. The differences in primary and secondary outcomes were not significant when spinal morphine was used. TAP block provides superior analgesia compared with placebo and can reduce the first 24 h morphine consumption in the setting of a multimodal analgesic regimen that excludes spinal morphine. TAP block can provide effective analgesia when spinal morphine is contraindicated or not used.

Keywords: acute pain, novel techniques; anaesthesia, obstetric; anaesthetic blocks, regional; analgesia, postoperative; regional blockade

TAP blok

Anaesthesia 2021, 76 (Suppl. 1), 136–147 doi:10.1111/anae.15233

Review Article

Regional anaesthesia for labour, operative vaginal delivery and caesarean delivery: a narrative review

P. Sultan,[1] **E. Sultan**[2] and **B. Carvalho**[3]

1 Associate Professor, 2 Clinical Instructor, 3 Professor, Department of Anesthesiology, Peri-operative and Pain Medicine, Stanford University School of Medicine, Stanford, CA, USA

Table 1 Summary of meta-analyses performed evaluating the use of transverse abdominis plane and quadratus lumborum blockade in the caesarean delivery setting.

	Number of included studies	Population of included patients	Primary outcome	Main findings
Abdallah et al. [32]	5	312 patients from randomised controlled trials where TAP blockade was compared with placebo.	Postoperative intravenous morphine consumption in the first 24 h.	Transversus abdominis plane blockade reduced the mean 24-h intravenous morphine consumption by 24 mg (95%CI -39.65 to -7.78) when spinal morphine was not used.
Mishriky et al. [33]a	9	512 patients from randomised controlled trials where TAP blockade was compared with placebo.	Pain scores and opioid consumption.	Transversus abdominis plane block significantly improved postoperative analgesia in women undergoing caesarean delivery who did not receive intrathecal morphine, but showed no improvement in those who received intrathecal morphine. Intrathecal morphine was associated with improved analgesia compared with TAP block alone at the expense of an increased incidence of side-effects.
Champaneria et al. [34]	20	1353 patients included in randomised controlled trials that assessed the effectiveness of TAP blocks following caesarean delivery	Pain score at rest.	Transversus abdominis plane blockade provides effective analgesia after caesarean delivery, however, additional benefits are more difficult to demonstrate when long-acting intrathecal opioids are administered.
Ng et al. [35]	14	770 patients included in randomised controlled trials examining the analgesic efficacy of TAP blocks vs. control after caesarean delivery.	Opioid consumption.	Low-dose TAP blocks for caesarean delivery provide analgesia and opioid-sparing effects comparable with the high-dose blocks. This suggests that lower doses can be used to reduce local anaesthetic toxicity risk without compromising the analgesic efficacy.

Infiltrace operační rány LA (LIA)

Review Article

Local anaesthetic wound infiltration used for caesarean section pain relief: a meta-analysis

Xiangnan Li[1*], Miao Zhou[2*], Xuan Shi[3*], Haiqin Yang[1], Yonghua Li[1*], Jian Li[1], Mei Yang[1], Hongbin Yuan[1]

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Table 1. Characteristics of eligible studies

No.	First Author	Cases	OQS	Sites of placement	Method of injection	Intervention	NRS Score	Morphine consumption	LA drug
1	Trotter TN, et al. 1991	14+14	5	Over the fascia	Single injection	0.5% bupivacaine; Saline	NA	Lower consumption at 12 h and 24 h	Morphine
2	Fredman B, et al. 2000	25+25	5	Over the fascia	Intermittent	0.2% ropivacaine; Sterile water	Lower pain at 3, 4 and 5 h	Lower consumption during 0-6 h	Morphine
3	Givens VA, et al. 2002	20+16	5	Over the fascia	Continuous; Bolus 25 ml	0.25% bupivacaine; Saline	No difference	Lower consumption during 0-48 h	Morphine
4	Lavand'homme PM, et al. 2007	30+30	5	Over the fascia	Intermittent	0.2% ropivacaine; Saline	Lower pain 12 h	Lower consumption	Morphine
5	Mecklem DW, et al. 1995	35+35	5	Below the fascia; Beneath the rectus sheath	Intermittent	0.25% bupivacaine; Saline	Lower pain 18-24 h	Lower consumption during 0-4 h and 18-24 h	Morphine
6	Zohar, et al. 2006	30+30	5	Over the fascia	Intermittent	0.25% bupivacaine; Saline (+i.v. diclofenac)	No difference	Higher consumption	Morphine
7	Anthony AB, et al. 2008	50+50	5	All layers of abdominal wall and the peritoneum	Single injection	0.75% ropivacaine; Saline	Lower pain during 15 min-24 h	Lower consumption during 1-24 h	Pethidine
8	Kainu JP, et al. 2012	22+20	5	Below the fascia	Intermittent; Bolus 20 ml	0.375% ropivacaine; Saline	No difference	Lower consumption 6, 9, 12 h	Oxycodone
9	Pavy T, et al. 2012	20+20	5	Over the fascia	Single injection	0.5% bupivacaine; Saline	No difference	NA	codeine phosphate +paracetomol
10	Reinikainen M, et al. 2014	33+34	5	Over the fascia	Continuous; Bolus 10 ml	0.75% ropivacaine; Saline	No difference	Lower consumption at first 6 h; but not 6-48 h.	Oxycodone

- **Kumulativní spotřeba mofinu byla nižší v LA skupině ve srovnání s placebem v prvních 12, 24 a 48 hodinách po operaci**. VAS bylo nižší po 12 hodinách ale ne po 6 hodinách v LA skupině oproti placebu. Za 24 i 48 hodin bylo VAS skóre nižší ve skupině s LA ale nedosáhlo statisticky významného rozdílu. Nižší výskyt pooperační nauzey byl zjištěn ve skupině s LA

Infiltrace operační rány LA

Kde infiltrovat?

- nad fascií 7 studií
- pod fascií 2 studie
- celou břišní stěnu včetně peritonea

Jednorázová nebo kontinuální?

- jednorázově 3x
- intermitentně 5x
- bolus + kontinuálně 2x

Bupivacain vs. Ropivacain?

- 0,5 - 0,25 % bupivacain 5x
- 0,75 - 0,375 ropivacain 5x

MgSO4

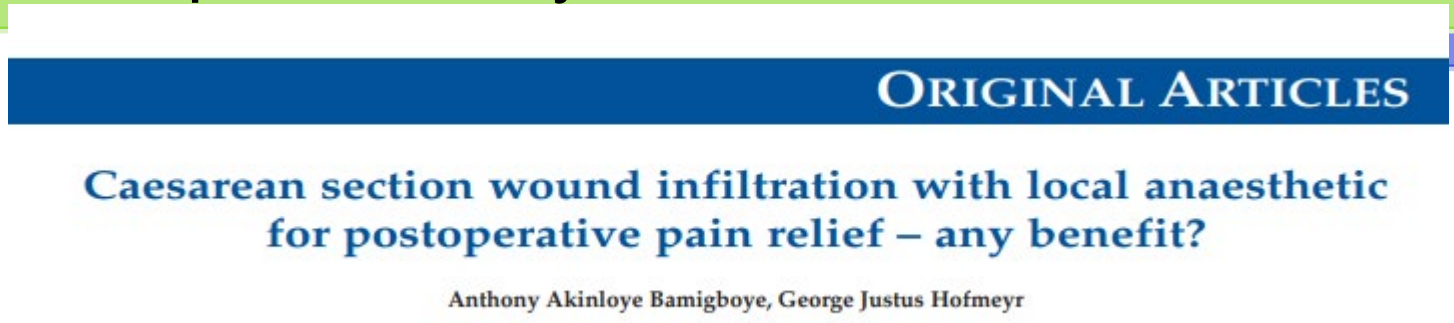
Original Article

Efficacy of Magnesium Sulphate as an Adjunct to Ropivacaine in Local Infiltration for Postoperative Pain Following Lower Segment Caesarean Section

SANDEEP KUNDRA[1], RUPINDER M SINGH[2], GAGANPREET SINGH[3], TANIA SINGH[4], VIKRANT JAREWAL[5], SUNIL KATYAL[6]

Infiltrace operační rány lokálním anestetikem společně s MgSO4 prodlužovala analgetický efekt lokálního anestetika bez zvýšení rizika nežádoucích účinků a tím i snižovala spotřebu dalších analgetik

Infiltrace operační rány, TAP blok


ORIGINAL ARTICLES

Caesarean section wound infiltration with local anaesthetic for postoperative pain relief – any benefit?

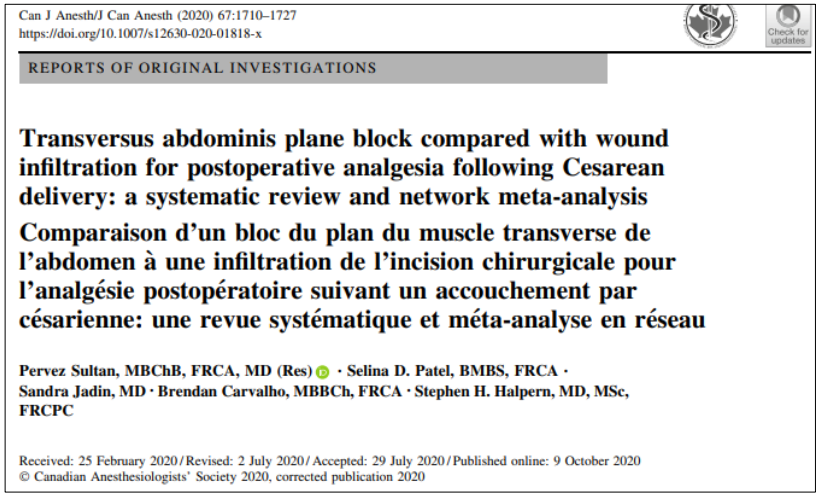
Anthony Akinloye Bamigboye, George Justus Hofmeyr

20 studií:

- Infiltrace rány LA vs. kontrolní skupina
- LA vs. **LA + NSAID**
- LA vs**. LA + ketamin**
- TAP blok vs. kontrolní skupina

- Infiltrace rány lokálním anestetikem u SC v RA snižuje spotřebu morfinu v prvních 24 hodinách ve srovnání s placebem
- **NSAID přidané k LA může poskytovat další benefit v léčbě bolesti**
- **Přidání ketaminu k LA nesnižovalo spotřebu analgetik ani nezlepšilo spokojenost rodiček**
- TAP blok snížil spotřebu opioidů, VAS během 24 hodin.

Infiltrace operační rány vs. TAP blok: review 2020



Can J Anesth/J Can Anesth (2020) 67:1710–1727
https://doi.org/10.1007/s12630-020-01818-x

REPORTS OF ORIGINAL INVESTIGATIONS

Transversus abdominis plane block compared with wound infiltration for postoperative analgesia following Cesarean delivery: a systematic review and network meta-analysis

Comparaison d'un bloc du plan du muscle transverse de l'abdomen à une infiltration de l'incision chirurgicale pour l'analgésie postopératoire suivant un accouchement par césarienne: une revue systématique et méta-analyse en réseau

Pervez Sultan, MBChB, FRCA, MD (Res) · Selina D. Patel, BMBS, FRCA · Sandra Jadin, MD · Brendan Carvalho, MBBCh, FRCA · Stephen H. Halpern, MD, MSc, FRCPC

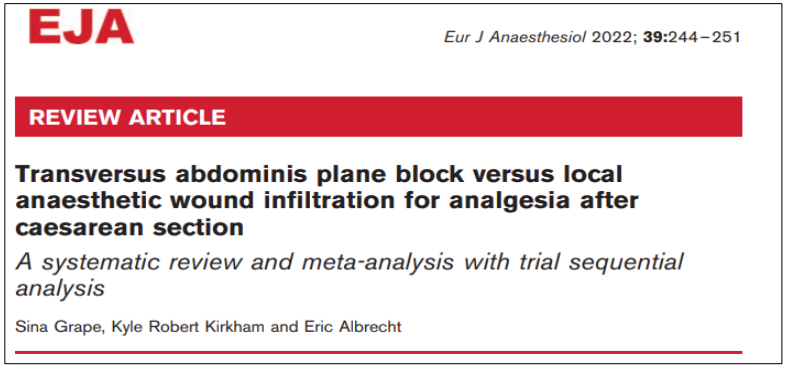
Received: 25 February 2020 / Revised: 2 July 2020 / Accepted: 29 July 2020 / Published online: 9 October 2020

45 studií:

- TAP blok vs. single dose WI (wound infiltration)
- TAP blok vs. kontinuální infúze WI

- **TAP blok a infiltrace operační rány s katétrem vedly k signifikantně nižší spotřebě opiátu během prvních 24 hodin** ve srovnání s kontrolní skupinou
- Ale nebyl zjištěn statisticky významný rozdíl mezi jednorázovou infiltrací operační rány LA a kontrolní skupinou
- Nebyl zjištěn stat. signifikantní rozdíl mezi TA,WC a WI skupinou ve VAS skóre, době k potřebě 1. analgetika, PONV, sedaci během prvních 24 hodin.

Infiltrace operační rány vs. TAP blok review 2022



EJA

Eur J Anaesthesiol 2022; **39**:244–251

REVIEW ARTICLE

Transversus abdominis plane block versus local anaesthetic wound infiltration for analgesia after caesarean section

A systematic review and meta-analysis with trial sequential analysis

Sina Grape, Kyle Robert Kirkham and Eric Albrecht

- Meta analýza zaměřená na **srovnání TAP bloku a single-injection technikou**
- Kontinuální techniky se zdají být inkompatibilní s fast-track surgery a časnou mobilizací (ERAS)

7 randomizovaných studií:

Žádný signifikatní rozdíl mezi oběma technikami – poskytují srovnatelnou pooperační analgezii

TAP blok vs. spinální morfin

British Journal of Anaesthesia **106** (5): 706–12 (2011)
doi:10.1093/bja/aer061

BJA

OBSTETRICS

Comparison of transversus abdominis plane block *vs* spinal morphine for pain relief after Caesarean section

R. C. N. McMorrow[1], R. J. Ni Mhuircheartaigh[1], K. A. Ahmed[1], A. Aslani[1], S.-C. Ng[1], I. Conrick-Martin[1], J. J. Dowling[1], A. Gaffney[1], J. P. R. Loughrey[1] and C. L. McCaul[1,2*]

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[2] University College Dublin School of Medicine and Medical Science, Dublin, Ireland

* Corresponding author. E-mail: cmccaul@rotunda.ie

4 skupiny:

- SmTs ITM 100 ug + FR
- SmTla ITM 100 ug + TAP Bupivacain 2 mg/kg
- SsTla FR + TAP Bupivacain 2 mg/kg
- SsTs (contro) FR + FR

- Spinální morfin zlepšuje analgezii po SC
- **TAP blok přidaný k intrathekálními morfinu nevede ke zlepšení pooperační analgezie**

Závěrem

Při srovnání **TAP blok vs. intrathekální morfin:**

TAP blok je spojen s vyšší spotřebou morfinu po operaci, vyšším VAS skóre a kratší dobou do 1. dávky analgetika

Intrathekální morfin je považován za lepší metodu pooperační analgezie oproti TAP bloku

TAP blok přidaný k intrathekálnímu morfinu:

nezlepšuje analgezii ani nevede k redukci vedlejších nežádoucích účinků při podání intrathekálního morfinu

Závěrem

Při srovnání **TAP blok vs. placebo bez užití intrathekálního morfinu:**

TAP blok je spojen **s nižší spotřebou morfinu**, může vést k nižšímu VAS skóre, delší době k potřebě 1. analgetické dávky, nižší frekvenci vedlejších nežádoucích účinků a **vyšší spokojenosti pacienta**

Infiltrace operační rány LA ve srovnání s placebem:

vede k nižší spotřebě morfinu a nižší incidenci nauzey po SC, záleží ale na místě aplikace (infiltrace různých vrstev i případně s peritonea) a na použití jednorázové aplikace či kontinuální katétrové metody

TAP blok a infiltrace operační rány

Doporučované dávky LA

- **u TAP bloku:**

40 ml 0,25 % bupivacainu nebo 0,5 % ropivacainu

- **u infiltrace operační rány:**

30 - 40 ml 0,25 % bupivacainu nebo 0,5 % ropivacainu

TAP blok je mírně favorizován ve srovnání s infiltrací operační rány LA

Závěrem

Každopádně v rámci konceptu multimodální analgezie je využívána ať už k intrathekálnímu morfinu, TAP bloku nebo LA infiltraci rány

neopiodní analgezie – NSAID a paracetamol

Závěrem

TAP blok nebo infiltrace operační rány LA mají být voleny jako další techniky v případě nemožnosti použít intrathekální morfin

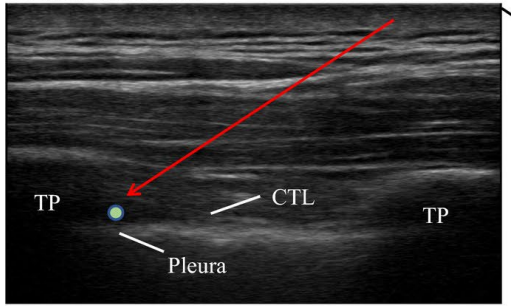
…. .ale využití těchto technik v kombinaci s neopioidními analgetiky je upřednostňováno před aplikací systémových opioidů

(REGIONÁLNÍ) ANALGEZIE PO CÍSAŘSKÉM ŘEZU

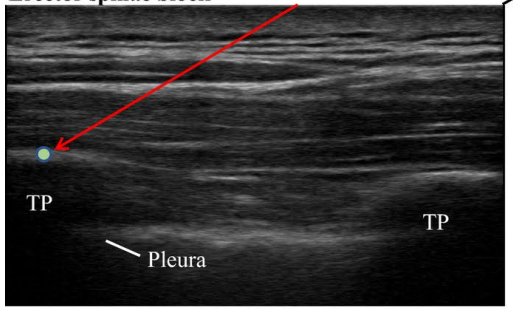
Děkuji Vám za pozornost

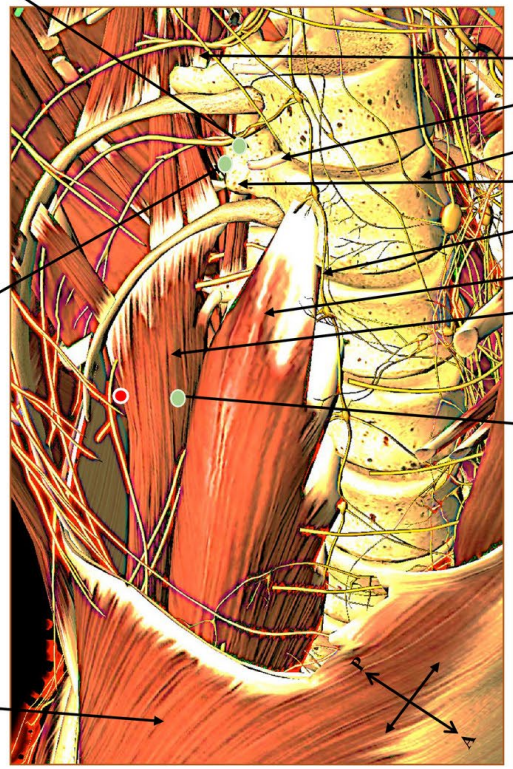
Quadratus lumborum block (QLB)

Paravertebral block

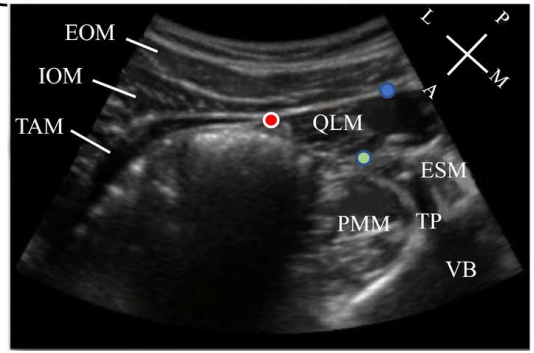


Erector spinae block





Quadratus lumborum block (QLB) *



TAP blok

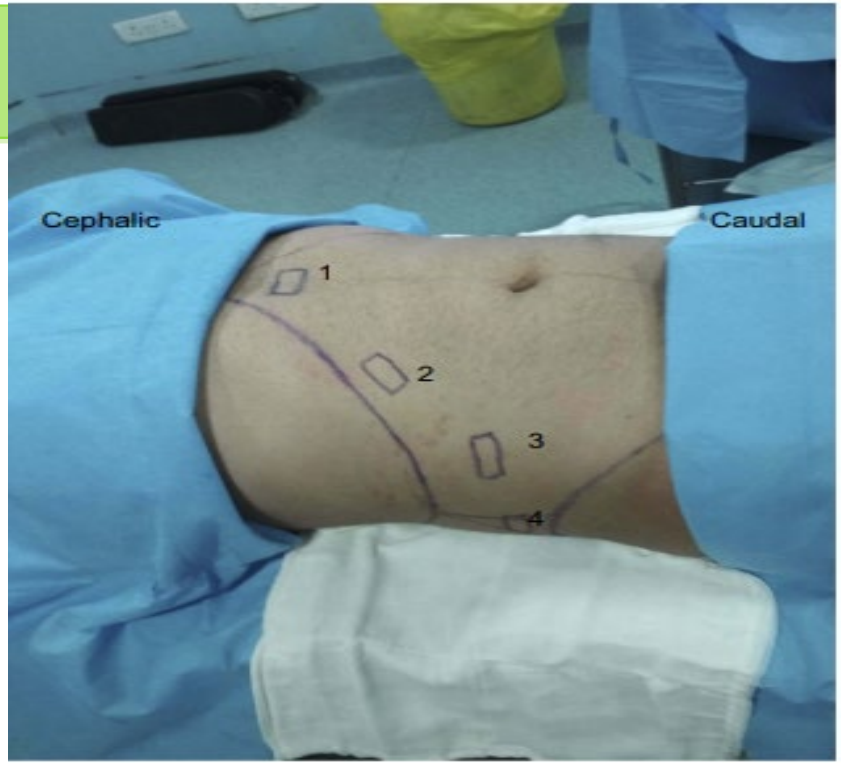


Figure 2 Suggested ultrasound probe positions for various approaches. (**A**) Initial scanning position for identification of linea alba and rectus abdominis, (**B**) probe position for subcostal approach, (**C**) probe position for lateral approach, (**D**) probe position for posterior approach.

TAP blok laterální

TAP blok posterior