

Konec epidurální anestezie v Čechách?

PRO

MUDr. Milan Jelínek

Anesteziologicko-resuscitační klinika

Fakultní nemocnice u sv. Anny v Brně

Anesteziologické techniky musí odpovídat vývoji a potřebám operačních výkonů

- Miniinvazivní chirurgie
- Vypořádat se s rostoucím počtem pacientů
- Využívat jednorázové techniky RA jako součást protokolů multimodální analgezie – jsou jednodušší, levnější, bezpečnější, s malou zátěží pro ošetřující personál
- Pokračující blokády využívat omezeně a cíleně při funkčním APS a dobré adherenci chirurgického pracoviště
- Analgetické techniky by neměly narušit pooperační plán a rehabilitaci

ČSARIM doporučený postup 2022

LÉČBA AKUTNÍ POOPERAČNÍ BOLESTI

Autoři: Ivo Křikava^{1,2}, Viktor Kubricht³, Jan Lejčko⁵, Jiří Málek⁴, Pavel Ševčík^{1,6}, Petr Štourač^{1,2,7}

Recenzenti: Martina Kosinová^{1,2,7}, Jiří Kozák⁸

VÝKONY S PŘEDPOKLÁDANOU VELKOU POOPERAČNÍ BOLESTÍ

„Epidurální techniky pro závažnost komplikací využívat jen tam, kde je není možné nahradit periferní blokádou se srovnatelným analgetickým účinkem.“

Vzhledem k rozsahu epidurální blokády je analgetická (nejenom) účinnost nezpochybnitelná

REVIEW

Efficacy of Postoperative Epidural Analgesia A Meta-analysis

Brian M. Block, MD, PhD

Spencer S. Liu, MD

Andrew J. Rowlingson, BA

Anne R. Cowan, MD

John A. Cowan, Jr, MD

Christopher L. Wu, MD

Context Whether epidural analgesia is a better method than parenteral opioids for postoperative pain control remains controversial.

Objective To systematically review the efficacy of postoperative epidural analgesia vs parenteral opioids, the primary alternative technique.

Data Sources Studies were identified primarily by searching the National Library of Medicine's PubMed database (1966 to April 25, 2002) and other sources for studies related to postoperative epidural analgesia.

Study Selection Inclusion criteria were a comparison of epidural therapy vs parenteral opioids for postoperative analgesia, measurement of pain using a visual analog scale (VAS) or numeric rating scale, randomization of patients to either therapy, a adult patients (≥ 18 years). A total of 1404 abstracts were identified, 100 of which met all inclusion criteria.

Data Extraction Each article was reviewed and data extracted from tables, text, extrapolated from figures as needed. Weighted mean pain scores, weighted mean differences in pain score, and weighted incidences of complications were determined using a fixed-effect model.

Data Synthesis Epidural analgesia provided better postoperative analgesia compared with parenteral opioids (mean [SE], 19.40 mm [0.17] vs 29.40 mm [0.20] on the VAS; $P < .001$). When analyzed by postoperative day, epidural analgesia was better than parenteral opioids on each postoperative day ($P < .001$ for each day after surgery). For all types of surgery and pain assessments, all forms of epidural analgesia provided significantly better postoperative analgesia compared with parenteral opioid analgesia ($P < .001$ for all), with the exception of thoracic epidural analgesia vs opioids for rest pain after thoracic surgery (weighted mean difference, 0.6 mm; 95% confidence interval, -0.3 to 1.5 mm; $P = .12$). The complication rates were lower than expected for nausea or vomiting and pruritus but comparable with existing data for lower extremity motor block.

Conclusion Epidural analgesia, regardless of analgesic agent, location of catheter placement, and type and time of pain assessment, provided better postoperative analgesia compared with parenteral opioids.

JAMA. 2003;290:2455-2463

www.jama.com

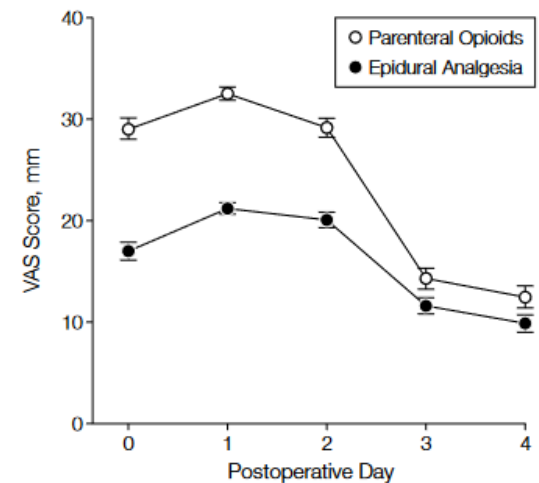
Anesthesiology 2005; 103:1079-88

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Efficacy of Postoperative Patient-controlled and Continuous Infusion Epidural Analgesia versus Intravenous Patient-controlled Analgesia with Opioids

A Meta-analysis

Christopher L. Wu, M.D.,* Seth R. Cohen, B.S.,† Jeffrey M. Richman, M.D.,‡ Andrew J. Rowlingson, B.A.,§ Genevieve E. Courpas, B.A.,§ Kristin Cheung, M.D.,|| Elaina E. Lin, B.A.,# Spencer S. Liu, M.D.**



Observations

| | | | | | |
|--------------------|------|------|------|-----|-----|
| Parenteral Opioids | 1104 | 2635 | 1496 | 794 | 536 |
| Epidural Analgesia | 1010 | 2618 | 1527 | 822 | 566 |

Vzhledem k rozsahu epidurální blokády jsou nezpochybnitelné i nežádoucí účinky

- Hypotenze 8-25%, větší tekutinová nálož, KA
- Močová retence- LEA vs TEA
- Svědění
- Nausea a zvracení
- Motorická blokáda DKK- LEA

Review > [Cochrane Database Syst Rev. 2003;\(3\):CD003071. doi: 10.1002/14651858.CD003071.](#)

Epidural analgesia for pain relief following hip or knee replacement

P T Choi ¹, M Bhandari, J Scott, J Douketis

Závažné komplikace EPI jsou velice vzácné, ale ...

Multicenter Study > Br J Anaesth. 2009 Feb;102(2):179-90. doi: 10.1093/bja/aen360.

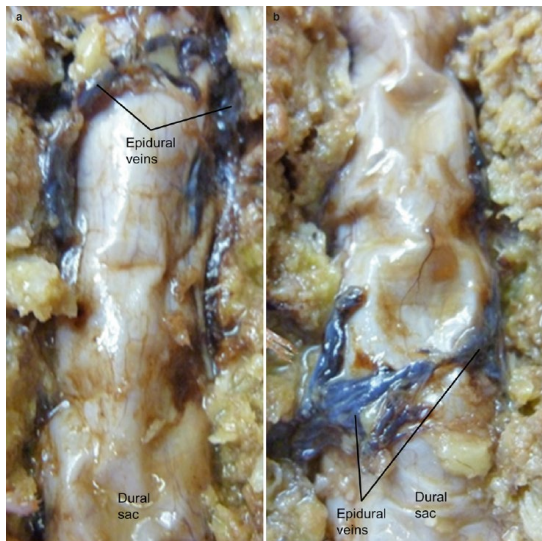
Epub 2009 Jan 12.

Major complications of central neuraxial block: report on the Third National Audit Project of the Royal College of Anaesthetists

T M Cook¹, D Counsell, J A W Wildsmith; Royal College of Anaesthetists Third National Audit Project

Affiliations + expand

PMID: 19139027 DOI: 10.1093/bja/aen360



- Epidurální hematom 1:150 000
- Poškození míchy nebo míšního kořene
- Epidurální absces (5 % spojeno s instrumentací v EPI prostoru)
- Arteria spinalis anterior syndrom

- Dohromady závažné neurologické komplikace 2-4,2/100 000

- Těžká bradykardie/ srdeční zástava
- Paraplegie nebo smrt 0,7-1,8/100 000

LEA

vs

TEA

- Vysoké riziko močové retence (S₁-S₃)
 - Titrace diferenciální blokády obtížná
 - Technicky jednodušší
- Minimální riziko močové retence
 - Pozitivní vliv blokády hrudního sympatiku na střevní motilitu, výskyt arytmií
 - Minimální riziko slabosti DKK

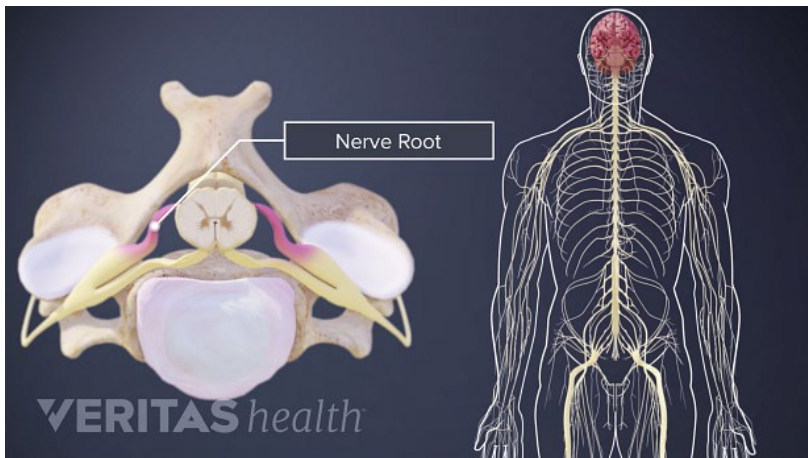
Research article

The diameters and number of nerve fibers in spinal nerve roots

YongTao Liu¹, Xiaoji Zhou¹, Jun Ma², YingBin Ge³, Xiaojian Cao¹

¹Department of Orthopedics, The First Affiliated Hospital of Nanjing Medical University, Nanjing, Jiangsu Province, China, ²Department of Orthopedics, The People's Hospital of Suqian, Drum Tower Hospital Group of Nanjing, Suqian, Jiangsu Province, China, ³Department of Physiology, Nanjing Medical University, Nanjing, Jiangsu Province, China

The Journal of Spinal Cord Medicine 2015 VOL. 38 NO. 4



| Segment | Diameter (mm) | |
|---------|---------------|-------------|
| | Ventral root | Dorsal root |
| C1 | 0.97 ± 0.16 | 1.21 ± 0.28 |
| C2 | 1.34 ± 0.30 | 2.61 ± 0.51 |
| C3 | 0.80 ± 0.23 | 2.87 ± 0.52 |
| C4 | 1.39 ± 0.24 | 2.49 ± 0.34 |
| C5 | 2.50 ± 0.55 | 3.43 ± 0.77 |
| C6 | 2.23 ± 0.73 | 3.99 ± 0.75 |
| C7 | 2.22 ± 0.50 | 4.61 ± 0.87 |
| C8 | 1.71 ± 0.60 | 3.92 ± 0.62 |
| T1 | 1.03 ± 0.23 | 2.18 ± 0.31 |
| T2 | 0.75 ± 0.11 | 1.30 ± 0.14 |
| T3 | 0.78 ± 0.10 | 1.35 ± 0.16 |
| T4 | 0.77 ± 0.17 | 1.13 ± 0.13 |
| T5 | 0.64 ± 0.08 | 1.21 ± 0.30 |
| T6 | 0.71 ± 0.18 | 1.07 ± 0.16 |
| T7 | 0.78 ± 0.15 | 1.25 ± 0.27 |
| T8 | 0.83 ± 0.25 | 1.29 ± 0.18 |
| T9 | 0.81 ± 0.15 | 1.33 ± 0.25 |
| T10 | 0.72 ± 0.08 | 1.27 ± 0.15 |
| T11 | 0.69 ± 0.08 | 1.26 ± 0.16 |
| T12 | 0.76 ± 0.14 | 1.45 ± 0.19 |
| L1 | 0.81 ± 0.07 | 1.55 ± 0.28 |
| L2 | 0.96 ± 0.16 | 1.93 ± 0.27 |
| L3 | 1.19 ± 0.07 | 2.24 ± 0.30 |
| L4 | 1.04 ± 0.07 | 2.48 ± 0.38 |
| L5 | 1.37 ± 0.16 | 2.66 ± 0.40 |
| S1 | 1.43 ± 0.16 | 2.95 ± 0.57 |
| S2 | 0.93 ± 0.11 | 2.02 ± 0.53 |
| S3 | 0.55 ± 0.07 | 1.32 ± 0.60 |
| S4 | 0.34 ± 0.03 | 0.52 ± 0.17 |
| S5 | 0.14 ± 0.02 | 0.27 ± 0.13 |

Selhávání epidurální analgezie 13 -30%

British Journal of Anaesthesia 109 (2): 144–54 (2012)
Advance Access publication 26 June 2012 · doi:10.1093/bja/aes214

BJA

REVIEW ARTICLES

Failed epidural: causes and management

J. Hermanides, M. W. Hollmann*, M. F. Stevens and P. Lirk

Department of Anaesthesiology, Academic Medical Center, University of Amsterdam, Meibergdreef 9, 1105AZ Amsterdam, The Netherlands

* Corresponding author. E-mail: m.w.hollmann@amc.uva.nl

Heinink et al. BMC Anesthesiology 2015, 15:5
http://www.biomedcentral.com/1471-2253/15/5



RESEARCH ARTICLE

Open Access

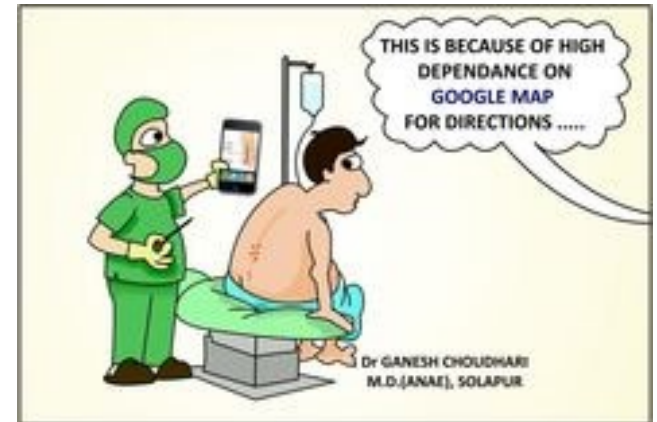
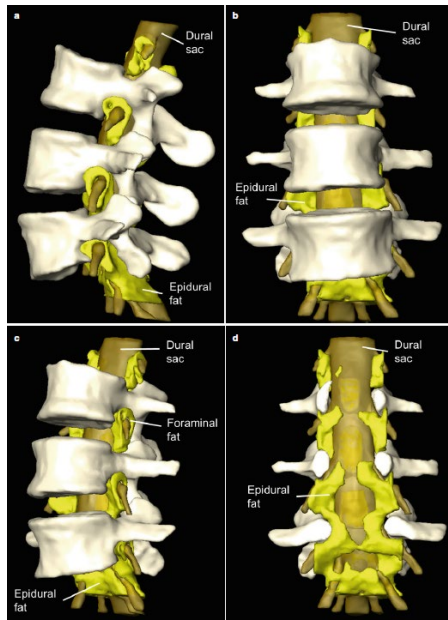
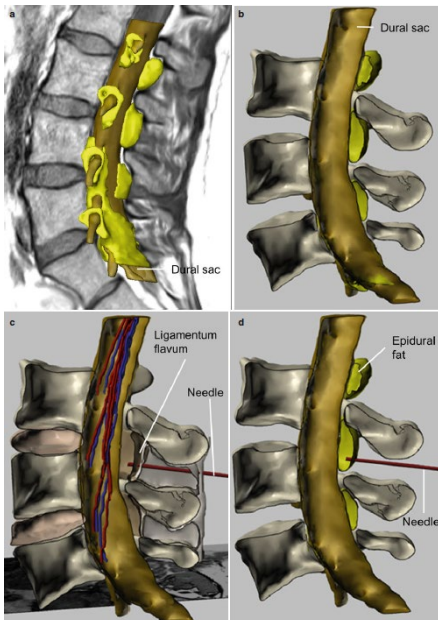
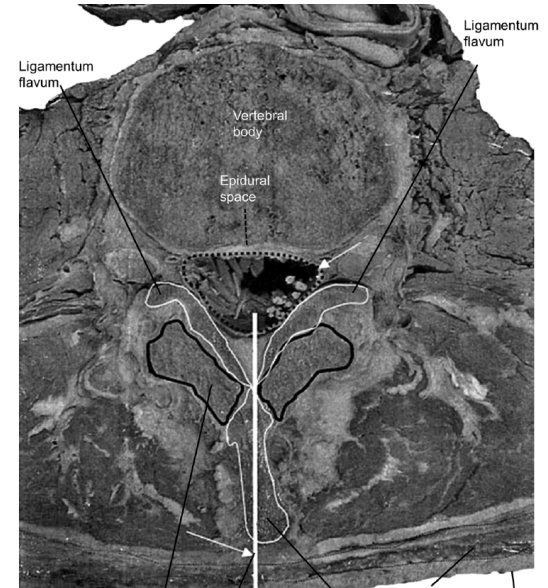
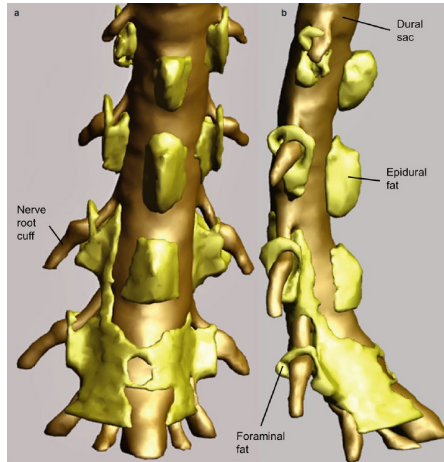
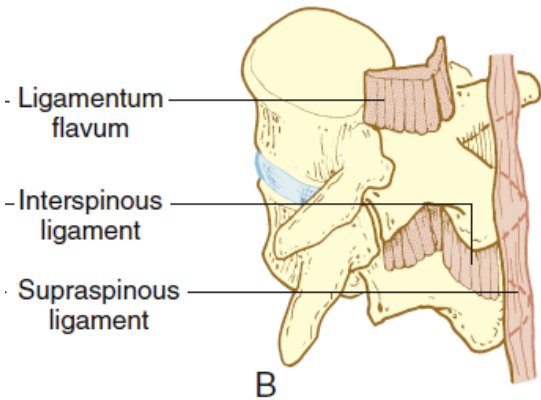
The effect of anaesthetist grade and frequency of insertion on epidural failure: a service evaluation in a United Kingdom teaching hospital

Thomas P Heinink^{1,2*}, Benjamin G Baker¹, Victoria F Yates¹, Dorothea C Addison¹ and John P Williams^{1,2,3}

Table 1 Definitions and rates of failed epidural anaesthesia or analgesia. *Pre-intervention group in an intervention study

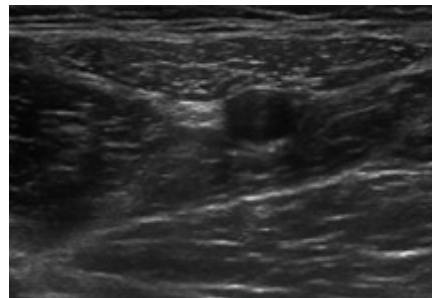
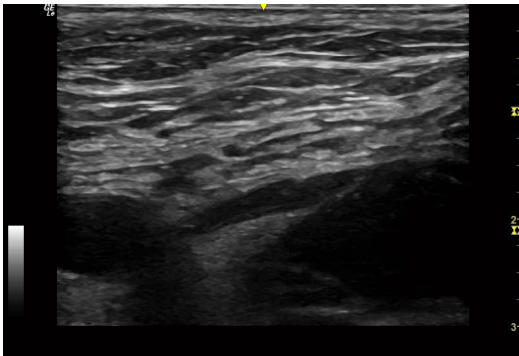
| | Type of surgery | Failure definition | Failure rate | Thoracic/lumbar |
|---|---|--|--------------------------------------|---------------------------|
| Eappen and colleagues ⁹⁷ | Parturients receiving epidural analgesia or anaesthesia for delivery | Any reason requiring catheter replacement after the catheter was secured to the back with adhesive tape, a greater than three dermatomal segment discrepancy between analgesic level as assessed by temperature (ice) sensation in a patient complaining of pain after the initial bolus of epidural bupivacaine | 550/4240 (13.1%) | Lumbar |
| Ready ¹ | All surgical patients | Any condition during the course of treatment that requires epidural catheter replacement or the addition of another major treatment modality such as i.v. patient-controlled analgesia | n=2140; thoracic (32%); lumbar (27%) | Thoracic:lumbar ?:? |
| McLeod and colleagues ⁹⁸ | Major oesophageal, gastric, small and large bowel surgery, and aortic aneurysm repair | Apparent inability to deliver local anaesthetic/opioid solution to the epidural space due to occlusion, dislodgement, or leakage, or poor spread within the epidural space resulting in patchy or unilateral block | 83/640 (13.0%) | Thoracic |
| Rigg and colleagues ²² | Major abdominal operations or oesophagectomy | Could not be inserted, removed before leaving operating theatre, removed before 72 h | 203/431 (47.1%) | Thoracic:lumbar ?:? |
| Neal ⁹⁹ | Oesophagectomy | Catheter dislodgement | 8/46 (14.2%) | Thoracic |
| Pan and colleagues ² | Obstetric neuraxial analgesia and anaesthesia | Epidural or CSE procedures resulting in inadequate analgesia or no sensory block after adequate dosing at any time after initial placement, inadvertent dural puncture with the epidural needle or catheter, i.v. epidural catheter, or any technique requiring replacement or alternative management | 1099/7849 (14%) | Lumbar |
| Motamed and colleagues ¹ | Major elective abdominal surgery for cancer | Interruption of epidural analgesia before 48 h for any reason. A VAS score that exceeded 30 mm at rest and persisted for 45 min after a rescue 5 ml epidural 0.125% bupivacaine injection and 1 g paracetamol i.v. were administered | 31/125 (24.8%) | Thoracic |
| Pratt and colleagues ⁹⁹ | Pancreatoduodenectomy | Aborted before anticipated (fourth postoperative day) because of haemodynamic compromise, inadequate analgesia, or both | 49/158 (31.0%) | Thoracic |
| Kinsella ¹⁰⁰ | Anaesthesia for Caesarean section | Loss of cold sensation, using ethyl chloride spray, from T4 (the nipples) down to S5 (the buttocks), and also anaesthesia (no feeling) to a 19 G needle inserted at several points along the line of surgical incision at T12 | 302/1286 (23.5%) | Thoracic:lumbar ?:? |
| Konigsrainer and colleagues ¹⁵ | Thoraco-abdominal surgery, upper abdominal surgery, colorectal surgery, and other | Motor weakness, catheter dislodgement, insufficient analgesia | 124/300* (41.4%) | Thoracic:lumbar 241:59 |

Technická náročnost



LEA-Historie RA v ortopedii pro TKA ve FNUSA

- 1997- intrathekální morfin
- 2003 -kontinuální epidurální analgezie
- 2010- kontinuální femorální blokáda
- 2015- single shot femoral, adductor. ch, iPACK
- Pokud zrychlí rehab.- adductor.ch, iPACK, LIA



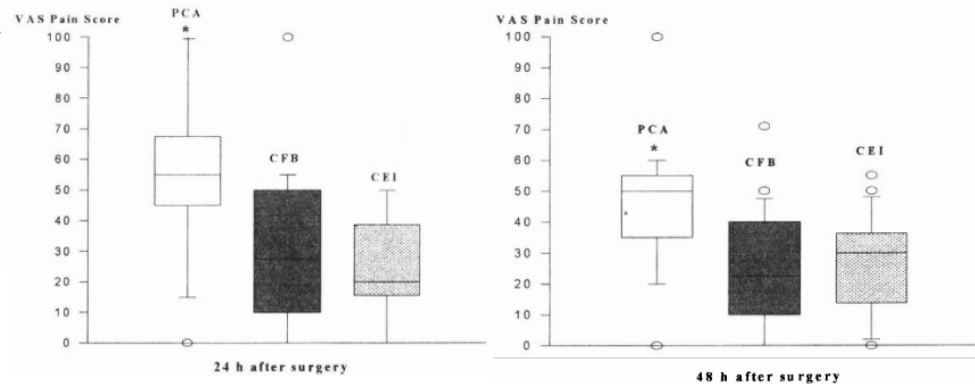
EPI vs kontinuální femorální blokáda TKA

CLINICAL INVESTIGATIONS

Anesthesiology
1999; 91:8-15
© 1999 American Society of Anesthesiologists, Inc.
Lippincott Williams & Wilkins, Inc.

Effects of Perioperative Analgesic Technique on the Surgical Outcome and Duration of Rehabilitation after Major Knee Surgery

Xavier Capdevila, M.D., Ph.D.,* Yves Barthelet, M.D.,* Philippe Biboulet, M.D.,* Yves Ryckwaert, M.D.,* Josh Rubenovitch, M.D., B.Sc.,* Françoise d'Athis, M.D.†



| Postoperative Hours | PCA (n = 19) | | | | CFB (n = 20) | | | | CEI (n = 17) | | | |
|-------------------------|--------------|------|------|------|--------------|------|------|------|--------------|------|------|------|
| | PACU | 24 h | 48 h | 72 h | PACU | 24 h | 48 h | 72 h | PACU | 24 h | 48 h | 72 h |
| Urinary retention (%) | 21* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 53† | 0 | 0 | 0 |
| Nausea (%) | 79 | 21* | 5 | 5 | 60 | 5 | 0 | 0 | 70 | 12 | 6 | 6 |
| Vomiting (%) | 32 | 10 | 0 | 0 | 25 | 0 | 0 | 0 | 35 | 6 | 0 | 0 |
| Pruritis (%) | 5 | 10 | 5 | 5 | 5 | 0 | 0 | 0 | 17 | 6 | 0 | 0 |
| Sedation (%) | 94 | 16 | 5 | 0 | 85 | 10 | 5 | 0 | 70 | 6 | 6 | 6 |
| Dysesthesia (%) | — | — | — | — | 20 | 5 | 5 | 0 | 41† | 30† | 12 | 0 |
| Local complications (%) | — | — | — | — | — | 20 | 10 | 0 | — | 17 | 6 | 0 |

| Postoperative Hours | PCA (n = 19) | | | | CFB (n = 20) | | | | CEI (n = 17) | | | |
|-------------------------------------|--------------|---------|--------|--------|--------------|---------|--------|--------|--------------|---------|---------|---------|
| | PACU | 24 h | 48 h | 72 h | PACU | 24 h | 48 h | 72 h | PACU | 24 h | 48 h | 72 h |
| Arterial hypotension (%) | 24 | 26 | 13 | 5 | 52* | 50* | 17 | 5 | 78† | 76† | 23.5† | 9 |
| Mean arterial blood pressure (mmHg) | 79 ± 7 | 88 ± 11 | 83 ± 7 | 84 ± 8 | 78 ± 10 | 77 ± 11 | 78 ± 9 | 79 ± 7 | 67 ± 7† | 69 ± 9† | 76 ± 9† | 77 ± 10 |

Anaesthesia
Journal of the Association of Anaesthetists of Great Britain and Ireland
Anaesthesia, 2008, 63, pages 1105-1123 doi:10.1111/j.1365-2044.2008.05565.x

REVIEW ARTICLE

A procedure-specific systematic review and consensus recommendations for postoperative analgesia following total knee arthroplasty

H. B. J. Fischer,¹ C. J. P. Simanski,² C. Sharp,³ F. Bonnet,⁴ F. Camu,⁵
E. A. M. Neugebauer,⁶ N. Rawal,⁷ G. P. Joshi,⁸ S. A. Schug⁹ and H. Kehlet¹⁰

REGIONAL ANESTHESIA
SECTION EDITOR
TERESE T. HORLOCKER

Continuous Femoral Nerve Blockade or Epidural Analgesia After Total Knee Replacement: A Prospective Randomized Controlled Trial

Michael J. Barrington, FANZCA, David Olive, FANZCA, Keng Low, FANZCA,
David A. Scott, PhD, FANZCA, Jennifer Brittain, MBA, BScPT, and Peter Choong, MD, FRACS

Analgetické techniky by neměly narušit pooperační plán a rehabilitaci

A ty prodělaly za 20 let značný vývoj !!!

- LOS 1999- 20d , 2010 – 4d (10d), 2020 -1-3d (4d)
- Rehabilitace – motorová dlaha vs aktivní rehabilitace a vertikalizace POD 0-1

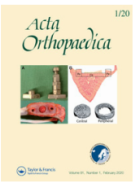
Summary and recommendations—Epidural analgesia is not recommended for routine use in hip and knee replacement because of the potential for adverse effects which delay recovery

Evidence level—High (analgesic efficacy), moderate (negative safety and side-effect profile)

Recommendation grade—Strong

Epidurals

Lumbar epidurals have been accepted as providing favorable analgesia postoperatively for lower limb surgery. However, there are potential side effects that delay recovery and these include hypotension, urinary retention, pruritus, and motor blockade. Also, serious complications such as permanent nerve damage are rare, but remain a concern (Choi et al. 2003, Rawal 2012). Alternative means of postoperative analgesia are now more effective and commonly used after uncomplicated knee or hip replacement.



Acta Orthopaedica



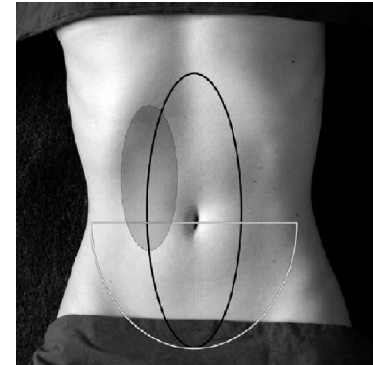
ISSN: 1745-3674 (Print) 1745-3682 (Online) Journal homepage: <https://www.tandfonline.com/loi/ort20>

Consensus statement for perioperative care in total hip replacement and total knee replacement surgery: Enhanced Recovery After Surgery (ERAS®) Society recommendations

Thomas W Wainwright, Mike Gill, David A McDonald, Robert G Middleton, Mike Reed, Opinder Sahota, Piers Yates & Olle Ljungqvist

TEA vs periferní bloky na trupu-rectus sheat , TAP, QLB, ESP, PVB.....

- Velká heterogenita studií
- Primárně jednostranné
- Přesun směrem od periferie centrálněji
- Sympatická blokáda??



Original research

Standardizing nomenclature in regional anesthesia: an ASRA-ESRA Delphi consensus study of abdominal wall, paraspinal, and chest wall blocks

Kariem El-Boghdady^{1,2}, Morné Wolmarans,³ Angela D Stengel,⁴ Eric Albrecht⁵,
Ki Jinn Chin⁶, Hesham Elsharkawy,^{7,8} Sandra Kopp⁹,
Edward R Mariano^{10,11}, Jeff L Xu,^{12,13} Sanjib Adhikary,¹⁴ Başak Altıparmak¹⁵,
Michael J Barrington,¹⁶ Sébastien Bloc^{17,18}, Rafael Blanco,¹⁹ Karen Boretzky,²⁰,
Jens Børglum²¹, Margaretha Breebaart,²² David Burckett-St Laurent,²³
Xavier Capdevila,²⁴ Brendan Carvalho,²⁵ Alwin Chuan²⁶, Steve Coppens,²⁷
Ioana Costache,²⁸ Mette Dam²⁹, Christian Egeler,³⁰ Mario Fajardo,³¹
Jeff Gadsden,³² Philippe Emmanuel Gautier,³³ Stuart Alan Grant,³⁴ Admir Hadzic,^{35,36}
Peter Hebbard,³⁷ Nadia Hernandez,³⁸ Rosemary Hogg,³⁹ Margaret Holtz,⁴⁰
Rebecca L Johnson⁴¹, Manoj Kumar Karmakar⁴², Paul Kessler,⁴³
Kwesi Kwofie,⁴⁴ Clara Lobo,⁴⁵ Danielle Ludwin,⁴⁶ Alan MacFarlane,⁴⁷
John McDonnell,⁴⁸ Graeme McLeod^{49,50}, Peter Merjavy,⁵¹ EML Moran,⁵²
Brian D O'Donnell,⁵³ Teresa Parras,⁵⁴ Amit Pawa^{55,56}, Anahi Perlas⁵⁷,
Maria Fernanda Rojas Gomez,⁵⁸ Xavier Sala-Blanch,^{59,60} Andrea Saporito,⁶¹
Sanjay Kumar Sinha,⁶² Ellen M Soffin⁶³, Athmaja Thottungal,⁶⁴ Ban C H Tsui⁶⁵,
Serkan Tulgar⁶⁶, Lloyd Turbitt,⁶⁷ Vishal Uppal⁶⁸, Geert J van Geffen,⁶⁹
Thomas Volk,^{70,71} Nabil M Elkassabany^{72,73}

Laparotomie-rectus sheat, TAP, QLB, ESP

Randomized Controlled Trial > BJS Open. 2022 May 2;6(3):zrac055.

doi: 10.1093/bjsopen/zrac055.

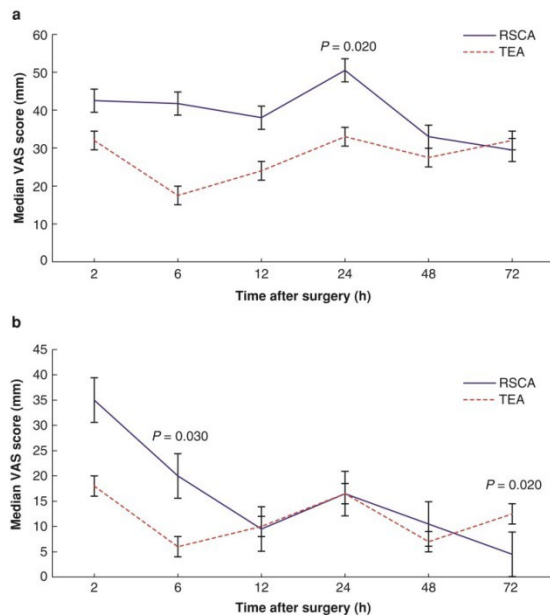
A comparison between thoracic epidural analgesia and rectus sheath catheter analgesia after open midline major abdominal surgery: randomized clinical trial

Anton Krige¹, Sarah G Brearley², Céu Mateus², Gordon L Carlson³, Steven Lane⁴

Affiliations + expand

PMID: 35543263 PMCID: [PMC9092444](#) DOI: [10.1093/bjsopen/zrac055](#)

- TEA lepší analgezie pouze prvních 24h
- Více nežádoucích účinků v TEA



Qin et al. *BMC Anesthesiology* (2020) 20:52
<https://doi.org/10.1186/s12871-020-00969-0>

BMC Anesthesiology

RESEARCH ARTICLE

Open Access

The analgesic efficacy compared ultrasound-guided continuous transverse abdominis plane block with epidural analgesia following abdominal surgery: a systematic review and meta-analysis of randomized controlled trials



Chaosheng Qin¹, Yuanming Liu², Jijun Xiong¹, Xiaogang Wang¹, Qinghua Dong¹, Tingshi Su³ and Jingchen Liu^{1*}

Medicine (Baltimore). 2018 Jun; 97(26): e11261.

Published online 2018 Jun 29. doi: [10.1097/MD.00000000000011261](#)

PMCID: [PMC6039642](#)

PMID: [29952997](#)

The analgesic efficacy of transverse abdominis plane block versus epidural analgesia

A systematic review with meta-analysis

[Moira Baeriswyl](#), MD,^a [Frank Zeiter](#), BSc,^a [Denis Piubellini](#), BSc,^a [Kyle Robert Kirkham](#), MD,^b and [Eric Albrecht](#), MD^{a,*}

Kolorektální chirurgie

- 60-70% miniinvazivní, laparoskopická , robotická
- Starší data platící pro otevřené laparotomie neplatí pro laparoskopické techniky
- Prodlužuje LOS i přes zkrácení pooperačního ileu

Randomized Controlled Trial > Ann Surg. 2015 Apr;261(4):648-53.
doi: 10.1097/SLA.0000000000000838.

Randomized clinical trial on epidural versus patient-controlled analgesia for laparoscopic colorectal surgery within an enhanced recovery pathway

Martin Hübner¹, Catherine Blanc, Didier Roulin, Michael Winiker, Sylvain Gander, Nicolas Demartines

Affiliations + expand

PMID: 25119117 DOI: 10.1097/SLA.0000000000000838

Surg Endosc (2013) 27:2581–2591
DOI 10.1007/s00464-013-2794-x



Effect of epidural analgesia on bowel function in laparoscopic colorectal surgery: a systematic review and meta-analysis

Suhail A. Khan · Haseeb A. Khokhar ·
A. R. H. Nasr · Eleanor Carton · Sherif El-Masry

International Journal of Colorectal Disease (2019) 34:27–38
<https://doi.org/10.1007/s00384-018-3207-3>

REVIEW



Thoracic epidural analgesia (TEA) versus patient-controlled analgesia (PCA) in laparoscopic colectomy: a systematic review and meta-analysis

Konstantinos Perivoliotis¹ · Chamaidi Sarakatsianou² · Stavroula Georgopoulou² · George Tzovaras¹ · Ioannis Baloyiannis¹

Systematic review

doi:10.1111/j.1463-1318.2012.03062.x

Evidence-based postoperative pain management after laparoscopic colorectal surgery

G. P. Joshi*, F. Bonnet† and H. Kehlet‡ on behalf of the PROSPECT collaboration¹

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Journal of the American College of Surgeons
Volume 225, Issue 5, November 2017, Pages 622-630



Original scientific article

Randomized Clinical Trial of Epidural Compared with Conventional Analgesia after Minimally Invasive Colorectal Surgery

Presented at the American College of Surgeons 101st Annual Clinical Congress, Scientific Forum, Chicago, IL, October 2015. It was the recipient of a Dedication and Excellence in Research Award.

Mark H. Hanna MD^a, Mehraneh D. Jafari MD^a, Fariba Jafari MD^a, Michael J. Phelan PhD^c, Joseph Rinehart MD^b, Coral Sun MD^b, Joseph C. Carmichael MD, FACS^a, Steven D. Mills MD, FACS^a, Michael J. Stamos MD, FACS^a, Alessio Pigazzi MD, PhD, FACS^a

Laparotomie-TEA- po roce 2000

Original Investigation

Analgesia After Open Abdominal Surgery in the Setting of Enhanced Recovery Surgery A Systematic Review and Meta-analysis

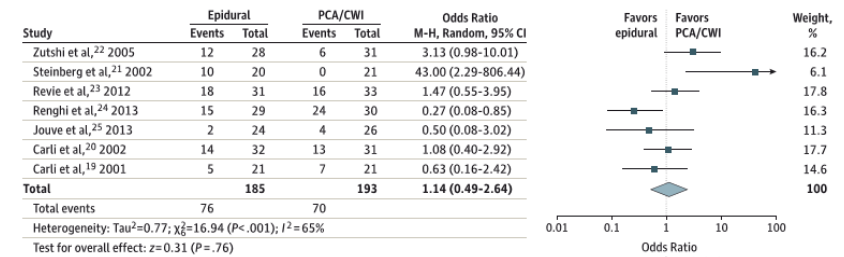
Michael J. Hughes, MBChB, MRCS; Nicholas T. Ventham, MBChB, MRCS; Stephen McNally, PhD, FRCS; Ewen Harrison, PhD, FRCS; Stephen Wigmore, MD, FRCS

Table 1. Study Characteristics

| Source | Type of Study | Operation | No. of Patients (Epidural/ Alternative) | Epidural Content | Protocol | Continuous Infusion, Yes/No | Length of Time In Situ | Alternative | Protocol |
|-------------------------------------|---------------|--------------------------|---|---|---|---|--|--------------------------------------|--|
| Carli et al, ¹⁹ 2001 | RCT | Open colorectal surgery | 21/21 | Bupivacaine, 0.1%, and fentanyl, 2 µg/mL | 4-14 mL/h | Yes, plus bolus as required | Up to 4 d | IV PCA morphine | Dose administered until VAS score <50 achieved; up to 4 d |
| Carli et al, ²⁰ 2002 | RCT | Open colorectal surgery | 32/32 | Bupivacaine, 0.1%, and fentanyl, 2 µg/mL | 4-15 mL/h | Yes | Up to 4 d | IV PCA morphine | 1-2 mg every 5 min; continued until POD 3-4 |
| Steinberg et al, ²¹ 2002 | RCT | Open colon surgery | 20/21 | Ropivacaine, 2 mg/mL, and fentanyl, 2 µg/mL at 8 mL/h | 8 mL/h | Yes | Until adequate pain control with oral analgesics was met (or a maximum of 6 d) | IV PCA morphine | 2-3 mg every 3-5 min until verbal pain score below 50/100 achieved; continued until adequate pain control with oral analgesics was met (or a maximum of 6 d) |
| Zutshi et al, ²² 2005 | RCT | Open intestinal surgery | 30/31 | Bupivacaine and fentanyl; concentration NS | NS | Yes, with supplemental 2-4 mL patient-controlled bolus (15-min lockout) | Until morning or second postoperative day | IV PCA morphine | NS: 48 h |
| Revie et al, ²³ 2012 | RCT | Open hepatic surgery | 31/33 | Bupivacaine, 0.1%, and fentanyl, 2 µg/mL | 7-10 mL/h | Yes | 48 h | CWI and IV PCA morphine | Levobupivacaine, 0.375%, 4 mL/h, in transversus abdominis plane and proctrectus sheath with 20-mL block of bupivacaine, 0.25%, for 48 h |
| Renghi et al, ²⁴ 2013 | RCT | Abdominal aortic surgery | 29/30 | Levobupivacaine, 0.25% | 4 mL/h | Yes | 48 h | CWI | Preoperative fascial 20 mL; levobupivacaine, 0.5%, followed by subfascial and subcutaneous double limbed catheter with levobupivacaine, 0.25%, infusion for 48 h |
| Jouve et al, ²⁵ 2013 | RCT | Open colorectal surgery | 24/26 | Ropivacaine, 0.2%, and sufentanil, 0.25 µg/mL | 5 mL/h and 5-mL bolus at 15-min lockout | Yes | 48 h | CWI, IV PCA morphine, and droperidol | Ropivacaine, 0.2%, 10 mL, then 10-mL/h infusion between closed parietal peritoneum and transversalis fascia for 48 h |

- Lepší analgezie
- Kratší pooperační ileus
- Ale bez efektu na komplikace, outcome a LOS

Figure 2. Forest Plot Showing All Complications Within 30 Days of Surgery in Epidural and Nonepidural Groups



Hepatální chirurgie- TEA, LIA, TAP

> Br J Surg. 2015 Jun;102(7):805-12. doi: 10.1002/bjs.9810. Epub 2015 Apr 15.

Epidural analgesia and perioperative kidney function after major liver resection

P Kambakamba¹, K Slankamenac, C Tschuor, P Kron, A Wirsching, K Maurer, H Petrowsky, P A Clavien, M Lesurtel

Affiliations + expand

PMID: 25877255 DOI: 10.1002/bjs.9810

RANDOMIZED CONTROLLED TRIAL

A Randomized Controlled Trial Comparing Epidural Analgesia Versus Continuous Local Anesthetic Infiltration Via Abdominal Wound Catheter in Open Liver Resection

Richard Bell, MRCS,* Deesa Ward, BSc,* Julie Jeffery, BSc, MS,* Giles J. Toogood, MD, FRCS,*
 JPeter A. Lodge, MD, FRCS,* Krishna Rao, MD, FRCA,† Sharmeen Lotia, FRCA,†
 Ernest Hidalgo, PhD, FRCS*

Annals of Surgery • Volume XX, Number XX, Month 2018

Randomized clinical trial

Randomized clinical trial of perioperative nerve block and continuous local anaesthetic infiltration via wound catheter versus epidural analgesia in open liver resection (LIVER 2 trial)

M. J. Hughes¹, E. M. Harrison¹, N. J. Peel¹, B. Stutchfield¹, S. McNally¹, C. Beattie² and S. J. Wigmore¹

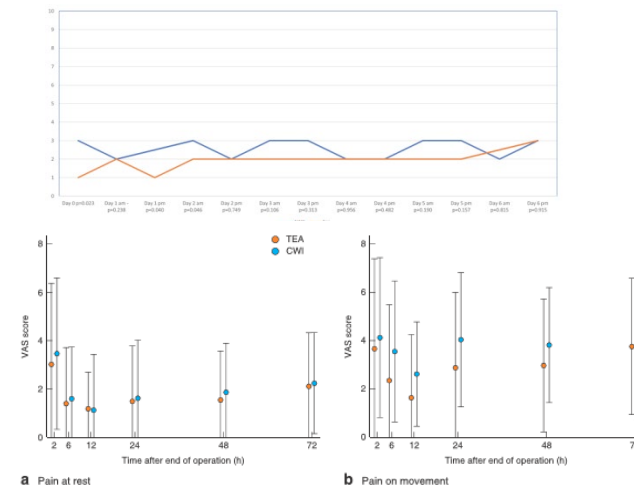
Anaesthesia
 Journal of the Association of Anaesthetists of Great Britain and Ireland
 Anaesthesia, 2011, 66, pages 465-471
 doi:10.1111/j.1365-2044.2011.06700.x

ORIGINAL ARTICLE

Comparison of analgesic efficacy of subcostal transversus abdominis plane blocks with epidural analgesia following upper abdominal surgery

G. Niraj,¹ A. Kelkar,¹ I. Jayapalan,¹ P. Graff-Baker,¹ O. Williams,¹ A. Darbar,²
 A. Maheshwaran² and R. Powell¹

- Retrospektivní, single center study
- 1153 pacientů
- Vyšší incidence AKI u TEA 10,1 vs 3,7%
- TEA větší procento selhání
- Četnější hypotenze a KA
- Složitější management
- Stejná stressová odpověď



Lumbotomie – ESP , aQLB



Journal of International Medical Research
50(3) 1–13
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DOI: 10.1177/03000605221086737
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SAGE

Prospective Clinical Research Report

Effect of ultrasound-guided erector spinae plane block on post-surgical pain in patients undergoing nephrectomy: a single-center, randomized, double-blind, controlled trial

Ayhan Şahin and Onur Baran

Journal of Pain Research

Dovepress
open access to scientific and medical research

ORIGINAL RESEARCH

Ultrasound Guided Continuous Erector Spinae Plane Block versus Patient Controlled Analgesia in Open Nephrectomy for Renal Malignancies: A Randomized Controlled Study

Ahmed Salah Abdelgalil, Ahmed Mansour Ahmed, Reham M Gamal, Mamdouh Mahmoud Elshah, Ahmed Hussein Bakeer, Ehab Hanafy Shaker

Ultrasound guided erector spinae plane block versus quadratus lumborum block for postoperative analgesia in patient undergoing open nephrectomy: A randomized controlled study

Shereen E. Abd Ellatif and Sara M. Abdelnaby

| Variable | Control group (n = 25) | QLB group (n = 25) | ESPB group (n = 25) | P-value |
|---|------------------------|--------------------|---------------------|------------|
| Time to first rescue analgesic (min): Mean ± SD | 60.2 ± 8.2 | 281.2 ± 18.5 | 268.1 ± 13.8 | * <0.001** |
| Total morphine (mg): Mean ± SD | 20.9 ± 1.7 | 11.4 ± 1.5 | 12.1 ± 1.3 | * <0.001** |
| Hospital stay (days): Mean ± SD | 1.8 ± 0.07 | 1.3 ± 0.3 | 1.4 ± 0.07 | * <0.001** |

Table 5. Comparison of the postoperative pain outcomes between the study groups.

| | Groups | | p-value |
|---|--------------------------|------------------------------|----------|
| | ESP block group (n = 30) | Non-ESP block group (n = 30) | |
| Number of patients in PACU [‡] | 4.0 [0.0–7.0] | 6.0 [4.0–9.0] | <0.001** |
| NRS hour 1 [‡] | 3.0 [0.0–6.0] | 5.5 [3.0–9.0] | <0.001** |
| NRS hour 2 [‡] | 3.0 [0.0–5.0] | 5.0 [3.0–8.0] | <0.001** |
| NRS hour 4 [‡] | 3.0 [1.0–5.0] | 5.0 [2.0–8.0] | <0.001** |
| NRS hour 8 [‡] | 3.0 [1.0–5.0] | 5.0 [2.0–8.0] | <0.001** |
| NRS hour 12 [‡] | 3.0 [1.0–7.0] | 5.0 [2.0–8.0] | 0.001** |
| NRS hour 24 [‡] | 4.0 [2.0–0] | 4.5 [2.0–8.0] | 0.020** |
| Total PCA dosing (mg) [‡] | 114.7 ± 40.0 | 212.0 ± 26.6 | <0.001* |
| Number of rescue analgesic doses [‡] | 1.0 [0.0–3.0] | 4.0 [2.0–5.0] | <0.001** |
| Number of PONV attacks | 0.0 [0.0–1.0] | 0.0 [0.0–1.0] | 0.999* |

Erector spinae plane block for postoperative analgesia in surgeries with lumbotomy approach: Case series

Sedat Hakimoglu, Senem Urfali, Onur Koyuncu, Taner Ozdemir

Table 1. Evaluation of cases underwent erector spinae block

| | Case 1 | Case 2 | Case 3 | Case 4 | Case 5 |
|---|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|---------------------------------------|
| Demographic Data | 45 yrs, 55 kg, 170 cm, Female, ASA 2 | 75 yrs, 80 kg, 160 cm, Female, ASA 3 | 47 yrs, 80 kg, 172 cm, Female, ASA 2 | 42 yrs, 82 kg, 162 cm, Female, ASA 1 | 73 yrs, 100 kg, 158 cm, Female, ASA 3 |
| Preoperative diagnose | Non-cancerous (benign) tumor | Nephrolithiasis | Non-cancerous (benign) tumor | Non-cancerous (benign) tumor | Non-cancerous (benign) tumor |
| Surgery type | Nephrectomy | Open stone surgery | Nephrectomy | Nephrectomy | Nephrectomy |
| •Duration of surgery (min) | 85 | 90 | 75 | 60 | 75 |
| Mean intra-operative remifentanyl consumption (mcg/kg/min) | 0.11 | 0.05 | 0.05 | 0.14 | 0.05 |
| | (Total 550 mcg) | (Total 400 mcg) | (Total 350 mcg) | (Total 700 mcg) | (Total 700 mcg) |
| Time to post-operative analgesic need (hrs) | 32 | 16 and 32 | 32 and 40 | 16 and 40 | 12 and 20 |
| Postoperative total mor-phine (mg/ 48 saat) | 5 | 10 | 5 | 10 | 15 |
| Postoperative total parace-tamole (gr) | 1 | 2 | 2 | 2 | 2 |

Lumbotomie – pokračující incizionální analgezie

Effectiveness of Epidural Analgesia, Continuous Surgical Site Analgesia, and Patient-Controlled Analgesic Morphine for Postoperative Pain Management and Hyperalgesia, Rehabilitation, and Health-Related Quality of Life After Open Nephrectomy: A Prospective, Randomized, Controlled Study

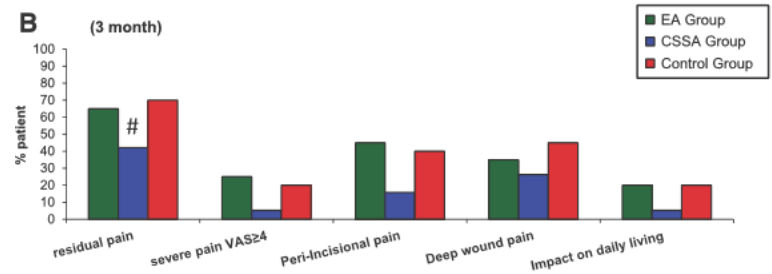
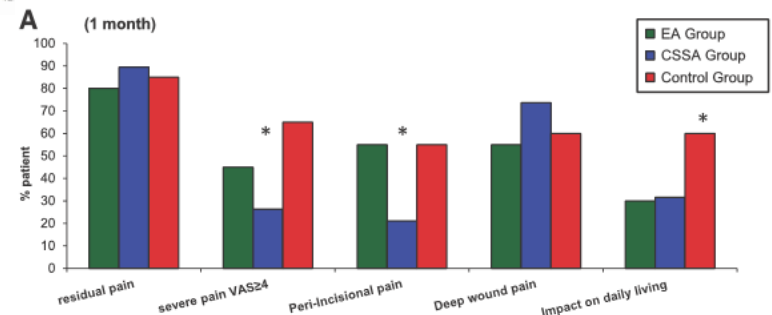
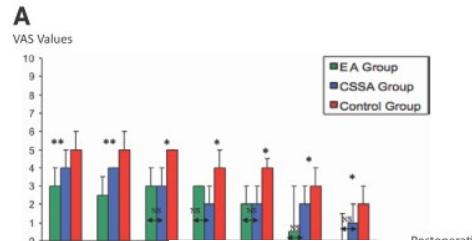
Xavier Capdevila, MD, PhD,* Sebastien Moulard, MD,* Christian Plasse, MD,* Jean-Luc Peshaud, MD,* Nicolas Molinari, PhD,† Christophe Dadure, MD, PhD,* and Sophie Bringuler, PharmD, PhD‡

BACKGROUND: There is no widely recognized effective technique to optimally reduce pain scores and prevent persistent postoperative pain after nephrectomy. We compared continuous surgical site analgesia (CSSA), epidural analgesia (EA), and a control group (patient-controlled analgesic morphine) in patients undergoing open nephrectomy.

METHODS: Sixty consecutive patients were randomized to be part of EA, CSSA, or control groups postoperatively for 72 hours. All patients received patient-controlled analgesic morphine, if needed. Hyperalgesia was assessed on the first, second, and third postoperative days. Chronic pain characteristics and quality of life were analyzed at 1 and 3 months. The primary outcome was the pain score at 24 hours. Secondary outcomes were morphine consumption, postoperative rehabilitation, hyperalgesia, chronic pain incidence, and quality-of-life parameters.

RESULTS: At 24 hours, mean \pm standard deviation pain values at rest (2.4 ± 1.7 , 2.2 ± 1.2 , and 4.2 ± 1.2 , respectively, in EA, CSSA, and control groups, $P < .001$) and during coughing was lower in the EA and CSSA groups. Total morphine consumption was higher in the control group. Rehabilitation parameters improved sooner in the EA and CSSA groups. Median values of area of hyperalgesia differed at 48 hours between the EA group and the control group (36.4 cm^2 and 52 cm^2) ($P = .01$) and at 72 hours among the EA group, CSSA group, and the control group (40 cm^2 , 39.5 cm^2 , and 59 cm^2 , respectively; $P = .002$). CSSA reduced the severity of pain and hyperalgesia at 1 month and optimized quality of life 3 months after surgery (role physical scores, $P = .005$).

CONCLUSIONS: CSSA and EA significantly improve postoperative analgesia, reduce postoperative morphine consumption, area of wound hyperalgesia, and accelerate patient rehabilitation after open nephrectomy. CSSA significantly reduces the severity of residual pain 1 month after surgery and optimizes quality-of-life parameters 3 months after surgery. (*Anesth Analg* 2017;124:336–45)



| VAS Score at | Analysis of Variance | | Mean VAS—(SD) | |
|--------------|----------------------|-------|---------------|-----------|
| | F | p | CWI | TEA |
| POD 0 | (1, 87) = [9.95] | 0.002 | 5.1 (2.9) | 2.8 (3.4) |
| POD 1 | (1, 88) = [5.02] | 0.03 | 4.9 (2.6) | 3.5 (2.7) |
| POD 2 | (1, 89) = [1.48] | 0.96 | 3.5 (2.6) | 3.6 (2.8) |
| POD 3 | (1, 87) = [4.51] | 0.025 | 3.8 (2.5) | 2.6 (2.3) |

Hrudní chirurgie

Thoracotomie –PVB vs EPI (ESP, SABP)

Randomized Controlled Trial > Eur J Anaesthesiol. 2006 Dec;23(12):999-1004.

doi: 10.1017/S0265021506001104. Epub 2006 Jul 7.

A prospective, randomized, blinded comparison between continuous thoracic paravertebral and epidural infusion of 0.2% ropivacaine after lung resection surgery

A Casati ¹, P Alessandrini, M Nuzzi, M Tosi, E Iotti, L Ampollini, A Bobbio, E Rossini, G Fanelli

Affiliations + expand

PMID: 16824243 DOI: 10.1017/S0265021506001104

Comparison of Continuous Thoracic Epidural With Paravertebral Block on Perioperative Analgesia and Hemodynamic Stability in Patients Having Open Lung Surgery

Tatjana Stopar Pintaric, MD, PhD,* Iztok Potocnik, MD, MS,* Admir Hadzic, MD, PhD,†
Tomaz Stupnik, MD,‡ Miha Pintaric, PhD,§ and Vesna Novak Jankovic, MD, PhD*
(Reg Anesth Pain Med 2011;36: 256–260)



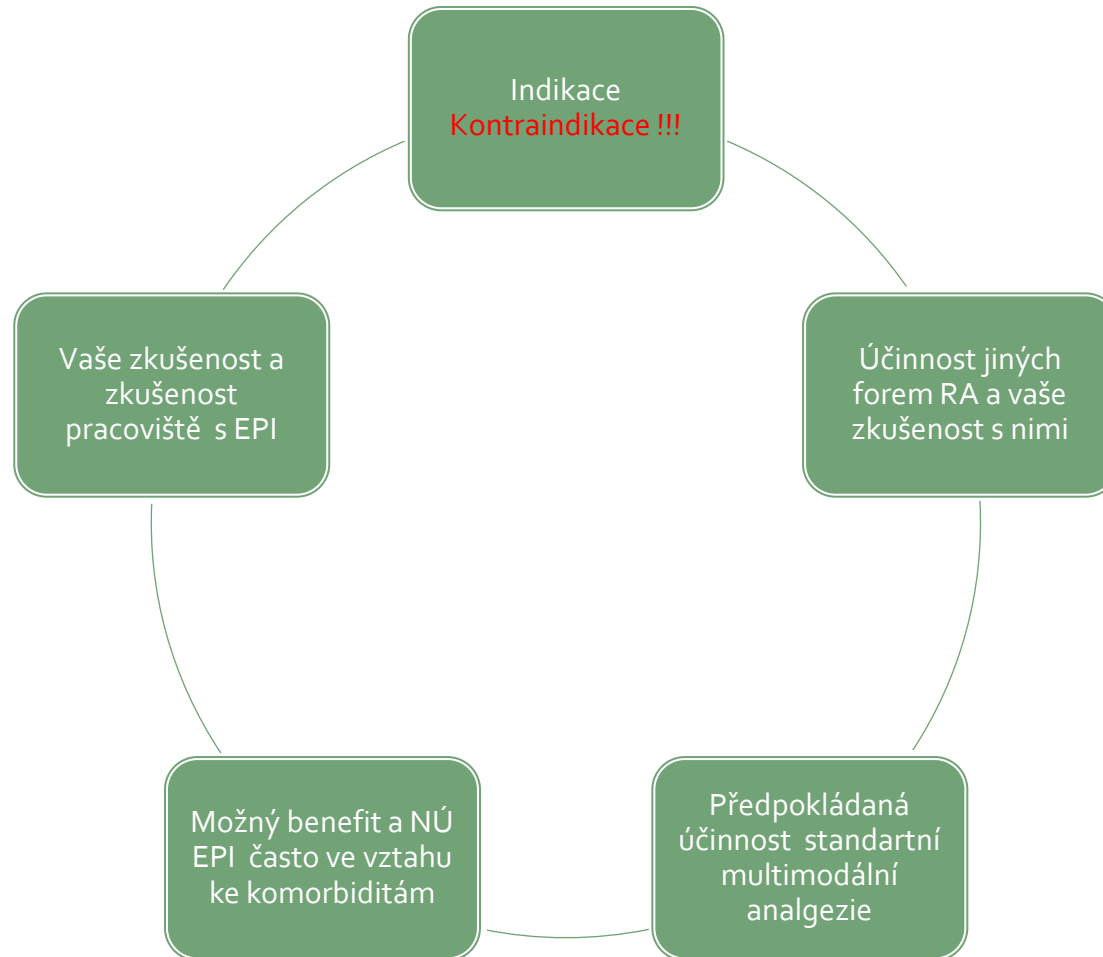
Paravertebral block versus thoracic epidural for patients undergoing thoracotomy (Review)

Yeung JHY, Gates S, Naidu BV, Wilson MJA, Gao Smith F

Cochrane Database of Systematic Reviews 2016, Issue 2. Art. No.: CD009121.
DOI: 10.1002/14651858.CD009121.pub2.

- Stejná analgetická účinnost
- Méně hypotenze, tekutin a KA
- Nelze prokázat vliv na mortalitu a závažné komplikace
- Účinnost nových technik je potřeba ověřit

Pokud uvažujete o EPI



Závěrem

- Vývoj operačních technik, zkrácení délky hospitalizace i zrychlení rehabilitace nás nutí přizpůsobit techniky pooperační analgezie tomuto vývoji
- Epidurální analgezie má své místo u výjimečně rozsáhlých bolestivých výkonů, nicméně její indikace klesá a bude klesat, tak jak se vyvíjí chirurgické postupy i postupy multimodální a regionální analgezie

Děkuji za pozornost

