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ESRA Italian Chapter

# XXVIII CONGRESSO NAZIONALE

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# POLITRAUMA E ANESTESIA LOCO-REGIONALE

**DOTT.SSA CHIARA MERENDA**

**DIRIGENTE MEDICO ANESTESIA 1 RIANIMAZIONE E MEDICINA DEL DOLORE**

**AZIENDA OSPEDALIERA SANTA MARIA DELLA MISERICORDIA PERUGIA**

**DIRETTORE FABIO GORI**





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Polytrauma, which was defined using the new Berlin definition, as cases with an Abbreviated Injury Scale (AIS)  $\geq 3$  for two or more different body regions and one or more additional variables from five physiologic parameters

- 1) hypotension [systolic blood pressure  $\leq 90$  mmHg]
- 2) unconsciousness [Glasgow Coma Scale score  $\leq 8$ ]
- 3) acidosis [base excess  $\leq -6.0$ ],
- 4) coagulopathy [INR  $\geq 1.4$ ]
- 5) age  $\geq 70$  years



International Journal of  
*Environmental Research  
and Public Health*



### **Polytrauma Defined by the New Berlin Definition: A Validation Test Based on Propensity-Score Matching Approach**

Cheng-Shyuan Rau <sup>1,†</sup>, Shao-Chun Wu <sup>2,†</sup>, Pao-Jen Kuo <sup>3</sup>, Yi-Chun Chen <sup>3</sup>, Peng-Chen Chien <sup>3</sup>,  
Hsiao-Yun Hsieh <sup>3</sup> and Ching-Hua Hsieh <sup>3,\*</sup>

Published: 11 September 2017



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Trauma is a significant public health problem.

It is the leading cause of death for the age group  
1–44 years

Third leading cause of death for all age groups.

The economic burden of trauma exceeds \$400  
billion in the US annually.





The management of pain in the acutely injured patient can be challenging. Resuscitation and the assessment and treatment of life-threatening injuries are first priority in a trauma patient, and provision of adequate analgesia must frequently be delayed until the patient is stable. However, there is increasing evidence that the pain associated with injury is undertreated, a condition termed “**oligoanalgesia**”.



Holdgate A, Shepherd SA, Huckson S. Patterns of analgesia for fractured neck of femur in Australian emergency departments. *Emerg Med Australas.* 2010;22(1):3-8.



> [Emerg Med Australas. 2010 Feb;22\(1\):3-8. doi: 10.1111/j.1742-6723.2009.01246.x.](#)  
Epub 2009 Dec 14.

## Patterns of analgesia for fractured neck of femur in Australian emergency departments

Anna Holdgate <sup>1</sup>, Shamus A Shepherd, Sue Huckson

Affiliations + expand

PMID: 20015246 DOI: [10.1111/j.1742-6723.2009.01246.x](#)



In a study of 36 Australian emergency departments, patients who presented with hip fracture (n=645) were found to have a mean time to first treatment of their fracture-related pain of 126 minutes.



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Review

> Am J Phys Med Rehabil. 2004 Feb;83(2):142-61.  
doi: 10.1097/01.PHM.0000107499.24698.CA.

## **Pain management in trauma patients**

Steven P Cohen <sup>1</sup>, Paul J Christo, Lee Moroz

In a study by Whipple et al.<sup>1</sup> assessing pain treatment in 17 patients with multiple trauma wounds, whereas 95% of house staff and 81% of nurses reported adequate analgesia, 74% of patients rated their pain as either moderate or severe.



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There are multiple reasons for poor pain management in trauma patients

- 1) under-appreciation of pain
- 2) excessive concern about hemodynamic instability and respiratory depression, and an unfounded fear of addiction. Yet to properly manage trauma, it is incumbent to aggressively treat pain, for the ramifications of inadequate pain control are more than just psychological.





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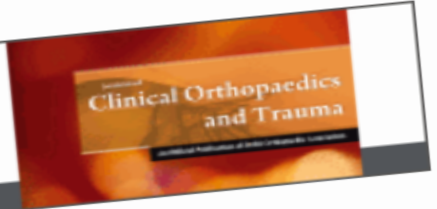


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Guide for Authors | About | Explore this Journal



[J Clin Orthop Trauma](#). 2021 Jul; 18: 38–43.

Published online 2021 Apr 20. doi: [10.1016/j.jcot.2021.03.025](https://doi.org/10.1016/j.jcot.2021.03.025)

## Oligoanalgesia in the emergency setting – An Indian review

[Mayank Vijayvargiya](#),<sup>a</sup> [Snehal Panchal](#),<sup>b</sup> [Ketan Asawale](#),<sup>c,\*</sup> and [Akshay Desai](#)<sup>c</sup>

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Potential factors for Oligoanalgesia in an emergency setting:<sup>6,7</sup>

Patient Factors	HCP Factors
Failure to report pain Underlying factors: <ul style="list-style-type: none"> <li>•Consciousness of patients during admission</li> <li>•Diagnosis at admission</li> </ul>	<b>Failure to acknowledge the presence of pain</b> Pain is assumed to be an expected byproduct of trauma and ignored Management of other symptoms take priority over pain management Studies over the years have shown that only 60% of patients received analgesics with delays up to 90 min. 74% of patients were discharged in moderate to severe pain.

Potential factors for Oligoanalgesia in an emergency setting:<sup>6,7</sup>

Patient Factors	HCP Factors
Ethnicity and racial factors Patients who are part of racial or ethnic minorities are at a greater risk of being under-evaluated and undertreated for their painful conditions in the emergency setting.	<b>Failure to assess pain</b> There are multiple factors responsible: <ul style="list-style-type: none"> <li>•Nature of primary cause of the admission.</li> <li>•Training received by the HCPs attending the patient.</li> <li>•Non-availability of pain assessment systems.</li> </ul> Studies show that HCPs gave statistically significant lower pain ratings than the patients and no pain scale assessments were employed while reviewing patient's charts.



Potential factors for Oligoanalgesia in an emergency setting:<sup>6,7</sup>

**Patient Factors**

**HCP Factors**

Biases related to age and sex of the patient

Studies show that the female gender received higher dose and stronger pain medications as compared to males. In the elderly population, pain medicines are frequently under prescribed.

**Failure to document pain**

Studies have shown that pain scale based documentation of the symptom is done in only 23%–44.5% patients.

**Failure to implement pain management guidelines**

Management of other symptoms take up priority over pain management. Studies show as much as 91% patients with unsatisfactory analgesia in the emergency setting.

**Opiophobia in the emergency department**

Studies show that due the prejudice against the use and prescription of opioid analgesics, the patients might be under-prescribed with such drugs.

**Behavioral Factors**

Failure to convey to patient the details about his management and medications increases anxiety and subsequently pain. Distrust of the practitioner to accept patient's reporting of pain intensity

Age

Gender

Race

No

documentation

No

guidelines



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Improved pain management has not only led to increased comfort in trauma patients, but has also been shown to reduce morbidity and improve long-term outcomesrld.





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## **Table 2. NEUROHUMORAL RESPONSE TO TRAUMA**

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### **Activators**

Neural stimuli (A-delta, C fiber afferents)  
Cytokines—Inflammatory factors

### **Systemic Response**

Increased catecholamines and sympathetic nerve activity  
Increased cortisol, growth hormone, ACTH, prolactin  
Increased renin, angiotensin, aldosterone, vasopressin  
Acute phase reactants—increased coagulability  
Altered immune response

### **Focal Responses**

Chest-upper abdomen trauma: pulmonary dysfunction  
Abdominal trauma: gastrointestinal dysfunction  
Musculoskeletal trauma: spasm and immobility

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Tratto da “Analgesia for trauma and burns”, R Hedderich , T J Ness, Crit  
Care Clin. 1999 Jan;15(1):167-84



# When ?





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## Early analgesia

.....since the FIRST pre-hospital phase, to counteract the pathophysiological consequences of acute pain and the stress response BUT also to reduce the incidence of chronic post-traumatic pain syndromes





**Where** does  
**regional anesthesia**  
**fit in?**





Approximately, **60%** of multiply injured patients with an Injury Severity Score greater than 16 have an extremity injury, and **30%** have two or more extremity injuries.

**20%** of multiply injured patients have both upper and lower extremity injuries. Since the majority of regional anesthesia procedures involve the extremities, their role in analgesia for trauma patients seems well suited.





## Fractured ribs

25% of annual traumatic deaths result from chest trauma.

12% Rib fractures

The number of rib fractures are directly related to the associated mortality:

- ❑ 5% for 1–2 ribs
- ❑ 15% for 3–5 ribs
- ❑ 34% for  $\geq 6$  ribs

The cause of mortality is related primarily to pulmonary injury (lung contusion, Pnx) and delayed pulmonary processes (pneumonia and ARDS)





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**Why?**



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The principal benefit of regional anesthetic techniques, and peripheral nerve blocks in particular, is the provision of high-quality analgesia that is site-specific and devoid of any systemic side effects.

**Regional anesthesia for the trauma patient: improving patient outcomes**

[Jeff Gadsden](#) and [Alicia Warlick](#)



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- 1) ↓ adverse effects compared to some conscious sedation techniques (eg, hypoxia, agitation, nausea/vomiting)
- 2) ↓ need for sedatives, an improved neurologic assessment
- 3) ↓ in opioid requirement and ORAEs
- 4) ↓ in length of stay in emergency or critical care units
- 5) ↑ comfort and safety for transport
- 6) ↓ need for staffing (secondary to decreased need for monitoring compared to procedural sedation)
- 7) ↓ in the stress response to injury
- 8) ↓ cost compared with conscious sedation (largely related to monitoring and staffing costs)

**Regional anesthesia for the trauma patient: improving patient outcomes**

[Jeff Gadsden](#) and [Alicia Warlick](#)



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# Who?







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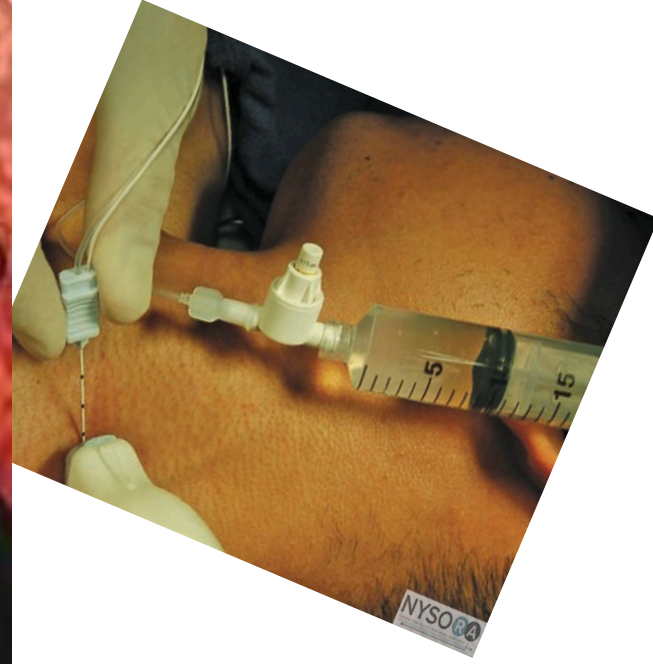
In most hospitals,  
**anesthesiologists**  
are the physicians  
most qualified  
to perform nerve blocks





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CPNB techniques prolong the duration of analgesia well beyond 16–24 h that can be expected from a single-injection nerve block

The pain intensity associated with trauma is often severe and longstanding, making CPNBs a useful tool.

Catheters can be left in for days to weeks, depending on the indication.

Patients with complex injuries that require repeated debridement, fracture fixation, and/or skin grafting frequently benefit from such long-term catheterization



## PubMed

U.S. National Library of Medicine  
National Institutes of Health

Display Settings: **Abstract**

Anaesth Intensive Care. 1978 Aug;6(3):256-8.

**Limits Activated:** only items with abstracts, Humans, Clinical Trial, Meta-Analysis, Randomized Controlled Trial, Review, English, Core clinical journals

### **Continuous lumbar plexus block--analgesia for femoral neck fractures.**

Brands E, Callanan VI.

In a series of 21 patients with fractures of the neck of the femur, continuous lumbar plexus block provided effective pain relief in 17 cases. The technique for continuous lumbar plexus block is described. The technique has advantages over conventional methods of analgesia.

PMID: 717775 [PubMed - indexed for MEDLINE]

MeSH Terms, Substances

LinkOut - more resources

Femoral nerve block: a simple and safe method of i... [Aust N Z J Surg. 1979] - Pub... Pagina 1 di 1

## PubMed

U.S. National Library of Medicine  
National Institutes of Health

Display Settings: **Abstract**

Aust N Z J Surg. 1979 Oct;49(5):592-4.

**Limits Activated:** only items with abstracts, Humans, Clinical Trial, Meta-Analysis, Randomized Controlled Trial, Review, English, Core clinical journals

### **Femoral nerve block: a simple and safe method of instant analgesia for femoral shaft fractures in children.**

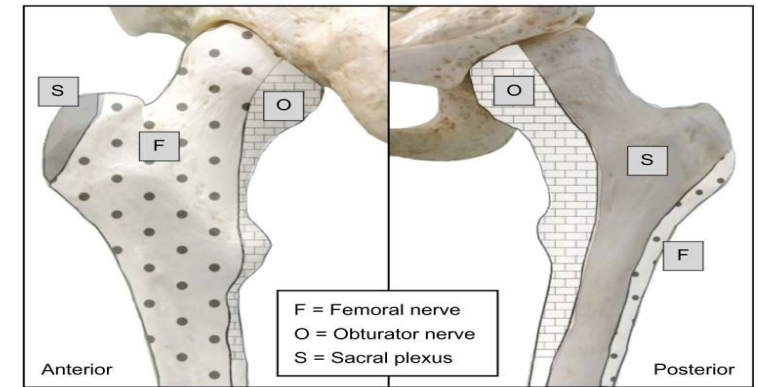
Grossbard GD, Love BR.

A simple safe technique of providing rapid, effective analgesia in children with femoral shaft fractures is described. It is particularly useful in patients who have associated head or abdominal injuries in the presence of which opiates should be withheld. The technique is recommended to all practitioners involved in the early care of femoral shaft fractures.

PMID: 292412 [PubMed - indexed for MEDLINE]



The femoral nerve innervates much of the femur and hip joint



Several studies have demonstrated that a femoral nerve block reduces pain intensity following hip fracture and are valuable adjuncts in this population, allowing patients to sit up, move in bed, deep breathe, and cough with reduced pain while awaiting surgery.

A Cochrane collaboration review of nerve blocks in patients with hip fractures concluded that femoral nerve block resulted in significant reductions in both pain intensity and opioid requirements both preoperatively and during surgery



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## Orthopaedics & Traumatology: Surgery & Research

journal homepage: [www.elsevier.com](http://www.elsevier.com)



Review article

### The effect of regional nerve block on perioperative delirium in hip fracture surgery for the elderly: A systematic review and meta-analysis of randomized controlled trials

Chul-Ho Kim<sup>a</sup>, Jae Young Yang<sup>b</sup>, Chan Hong Min<sup>b</sup>, Hyun-Chul Shon<sup>b</sup>, Ji Wan Kim<sup>c</sup>,  
Eic Ju Lim<sup>b,\*</sup>

<sup>a</sup> Department of Orthopaedic Surgery, Chung-Ang University Hospital, Chung-Ang University College of Medicine, Seoul, Republic of Korea

<sup>b</sup> Department of Orthopaedic Surgery, Chungbuk National University Hospital, Chungbuk National University College of Medicine, 776 1sunhwan-ro, Seowon-gu, Cheongju, Republic of Korea

<sup>c</sup> Department of Orthopaedic Surgery, Asan Medical Center, University of Ulsan College of Medicine, Seoul, Republic of Korea





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ULTRASOUND CASE REVIEWS



# Ultrasound-Guided Popliteal Sciatic Nerve Block for an Ankle Laceration in a Pediatric Emergency Department

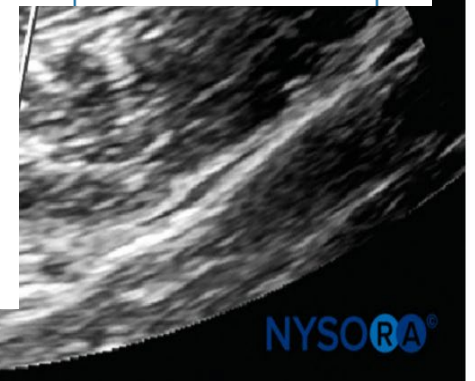
Mori, Takaaki MD; Hagiwara, Yusuke MD, MPH

Communicator(s): Mori, Takaaki MD; Hagiwara, Yusuke MD, MPH  
Editor(s): Deanehan, J. Kate MD, RDMS, Associate Editor

**Bloc s** [Author Information](#)

**prého** *Pediatric Emergency Care* 33(12):p 803-805, December 2017. | DOI: 10.1097/PEC.0000000000001334

## Sciatic nerve block in prehospital care



NYSORA®



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# Ultrasound-guided supra-inguinal fascia iliaca compartment block for older adults admitted to emergency department with hip fracture: a randomized controlled, double-blind clinical trial

[Liang Chen](#), [Yang Shen](#) , [Shuangmei Liu](#), [Yanyan Cao](#) & [Zhe Zhu](#)



## REGIONAL ANESTHESIA AND ACUTE PAIN

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### BRIEF TECHNICAL REPORT

# Pericapsular Nerve Group (PENG) Block for Hip Fracture

*Laura Girón-Arango, MD,\*† Philip W.H. Peng, MBBS, FRCPC, Founder (Pain Med),\*†*

*Ki Jinn Chin, MBBS, MMed, FANZCA, FAMS, FRCPC,\*†*

*Richard Brull, MD, FRCPC,\* and Anahi Perlas, MD, FRCPC\*†*



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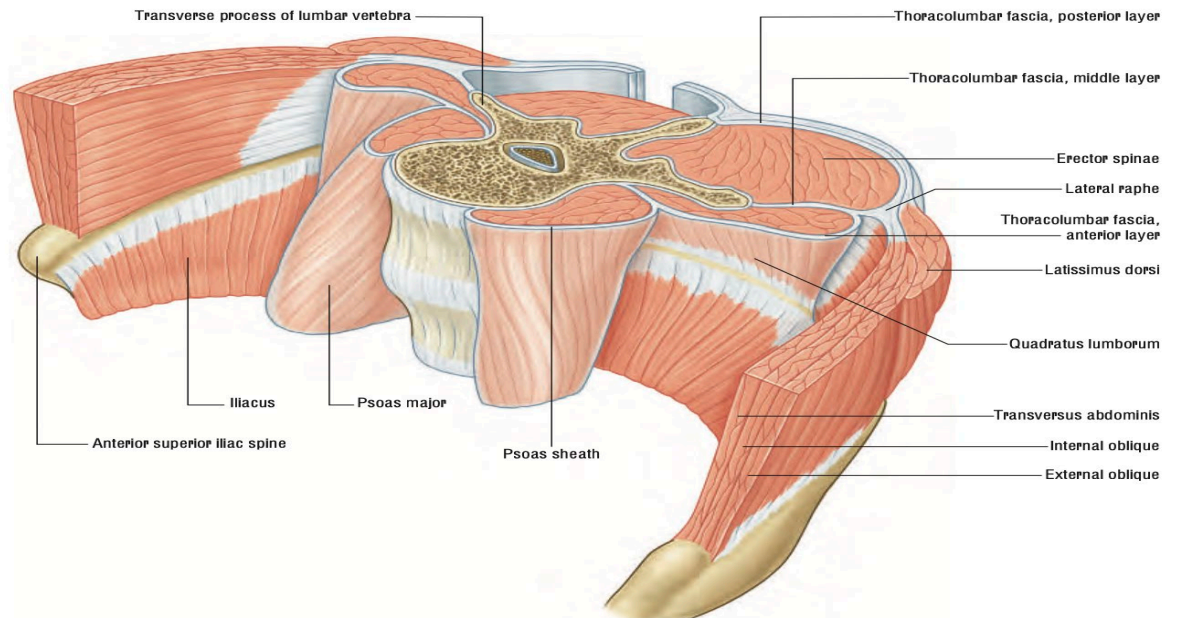
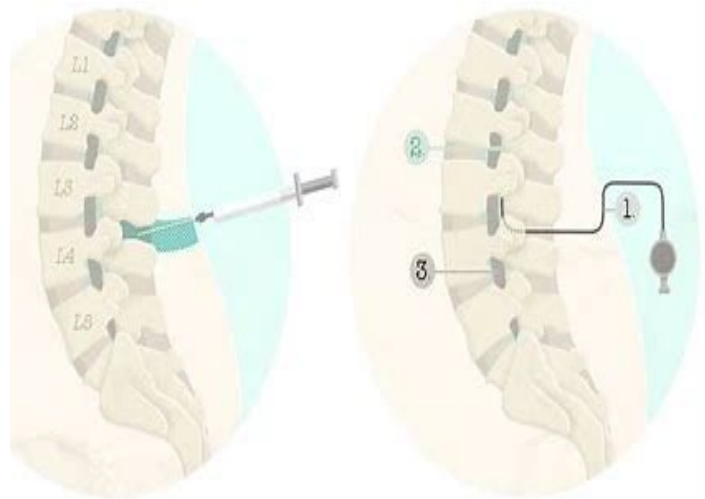


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The goal of therapy should be to minimize respiratory depression and optimize respiratory excursion, while minimizing possible side effects or complications of the technical procedure such as local anesthetic systemic toxicity or iatrogenic pneumothorax.





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# Erector Spinae Plane Block

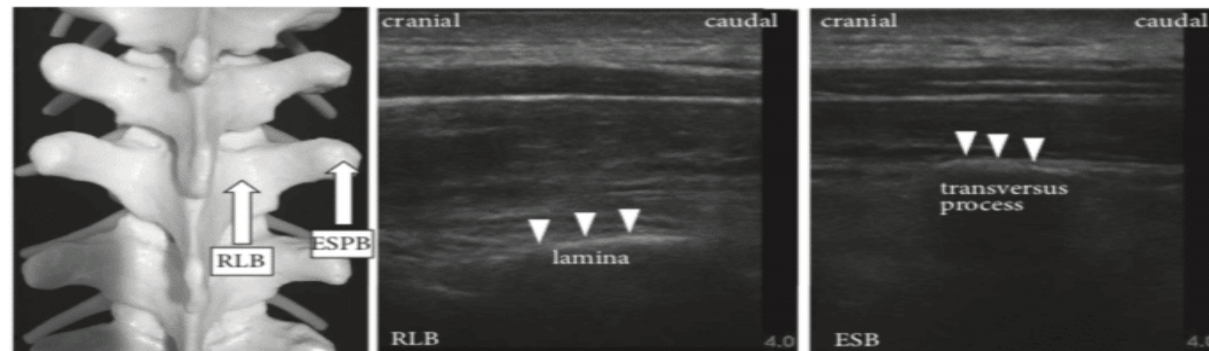
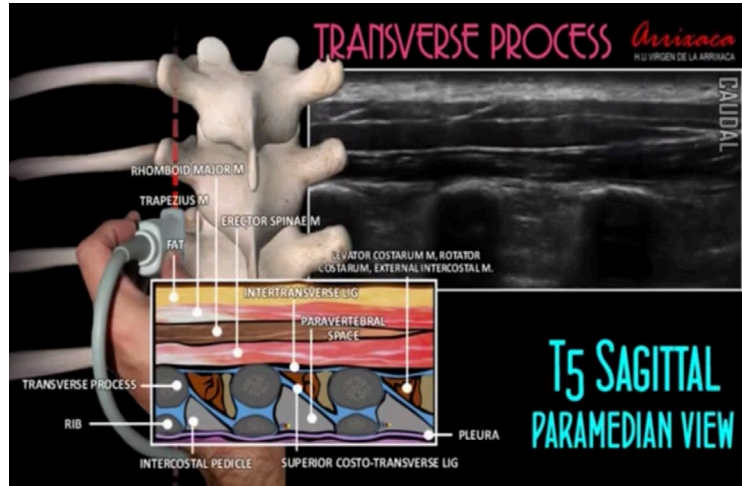
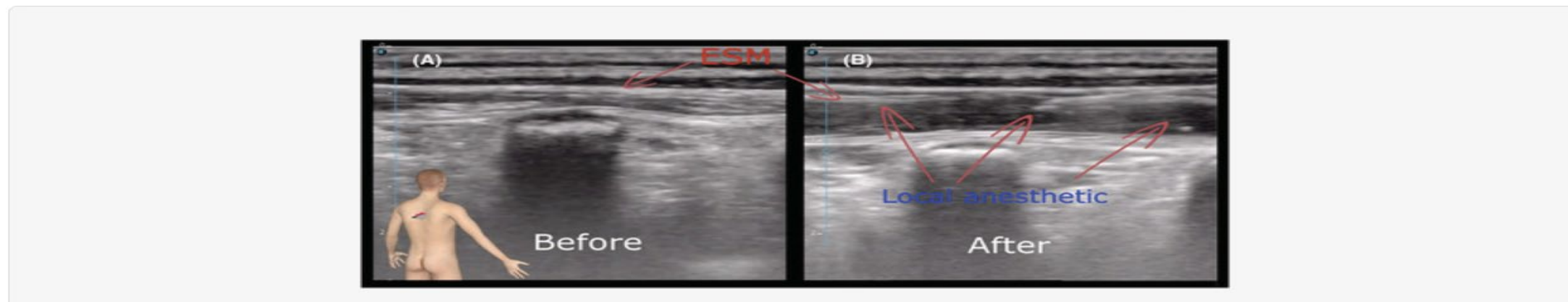


FIGURE 2: Ultrasound images of retrolaminar block and erector spinae plane block. The sagittal plane with a linear ultrasound probe allows for visualization of the laminae or transversus process. The insertion points for retrolaminar block (RLB) and erector spinae plane block (ESPB) are similar. The transversus process is more superficial than the lamina in the ultrasound image, and the injection point for ESPB is close to the pleura.



Erector spinae block is effective and safe in treating severe chest pain caused by penetrating trauma after explosion in war setup.



[Clin Case Rep.](#) 2022 Oct; 10(10): e6433.

Published online 2022 Oct 8. doi: [10.1002/ccr3.6433](https://doi.org/10.1002/ccr3.6433)

PMCID: PMC9547350

PMID: [36245449](https://pubmed.ncbi.nlm.nih.gov/36245449/)

Erector spinae plane block for affective and safe analgesia in a patient with severe penetrating chest trauma caused by an explosion in the battlefield

[Dmytro Dmytriiev](#),<sup>1</sup> [Dan Sebastian Dîrzu](#),<sup>2</sup> [Mykola Melnychenko](#),<sup>1</sup> and [Rudiger Eichholz](#)<sup>3</sup>

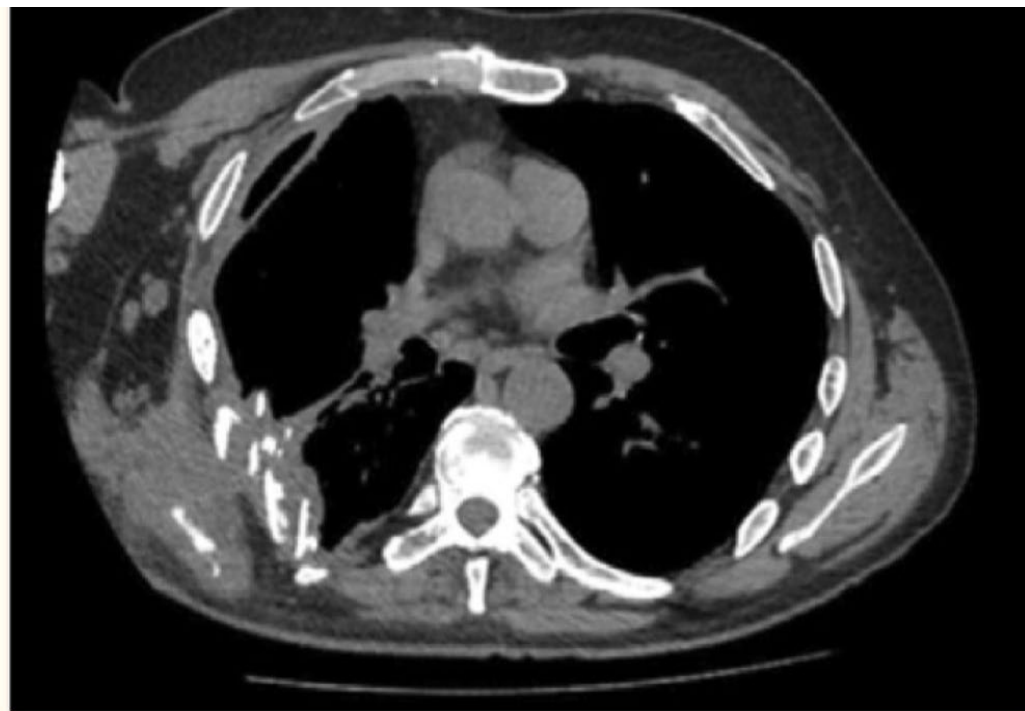


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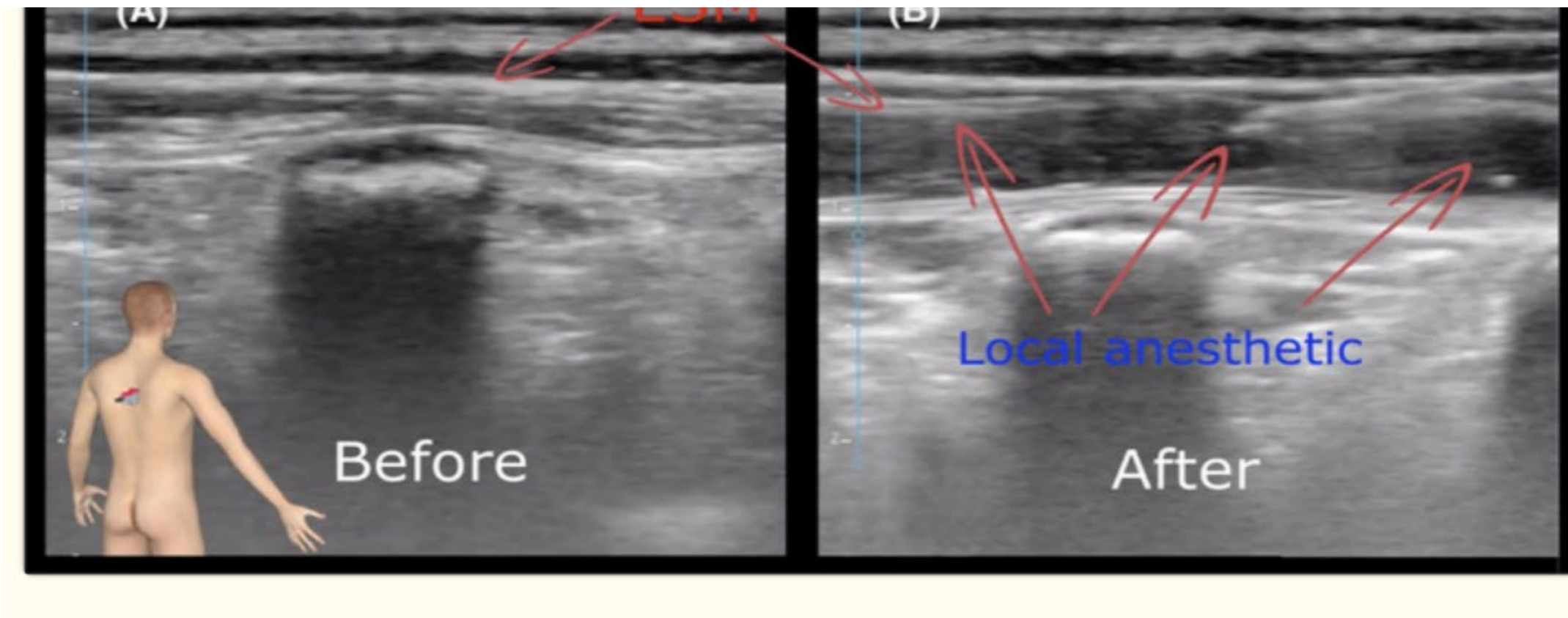
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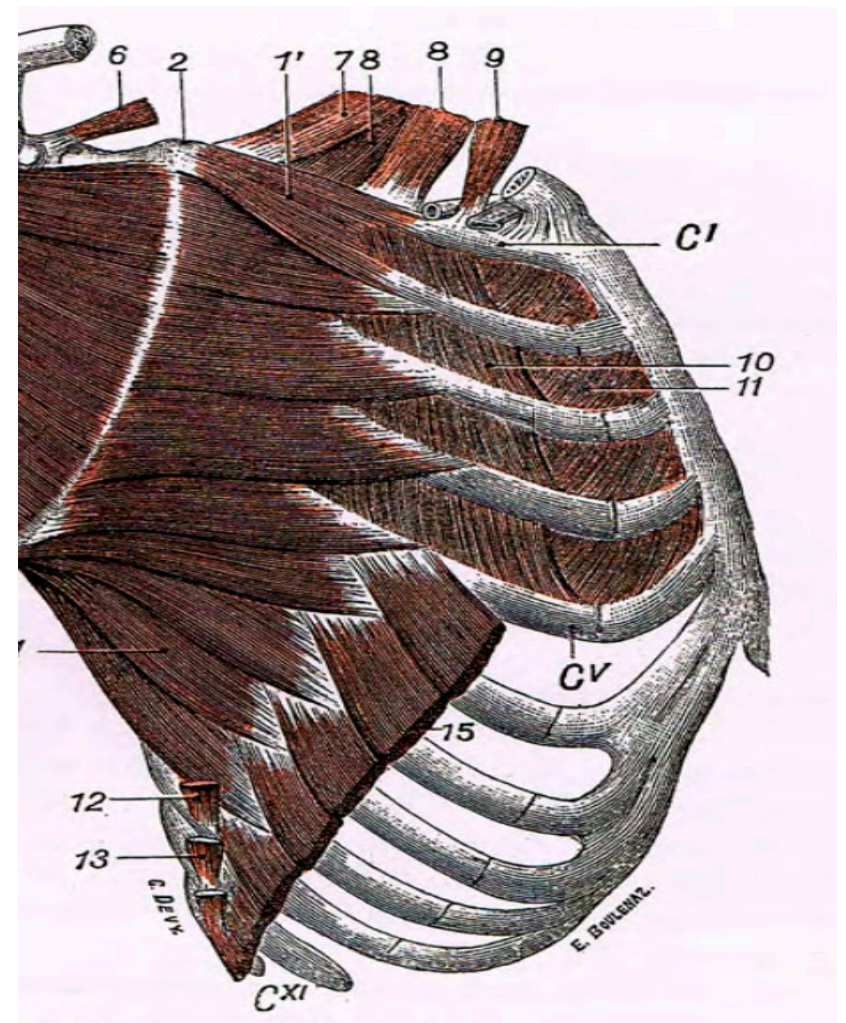
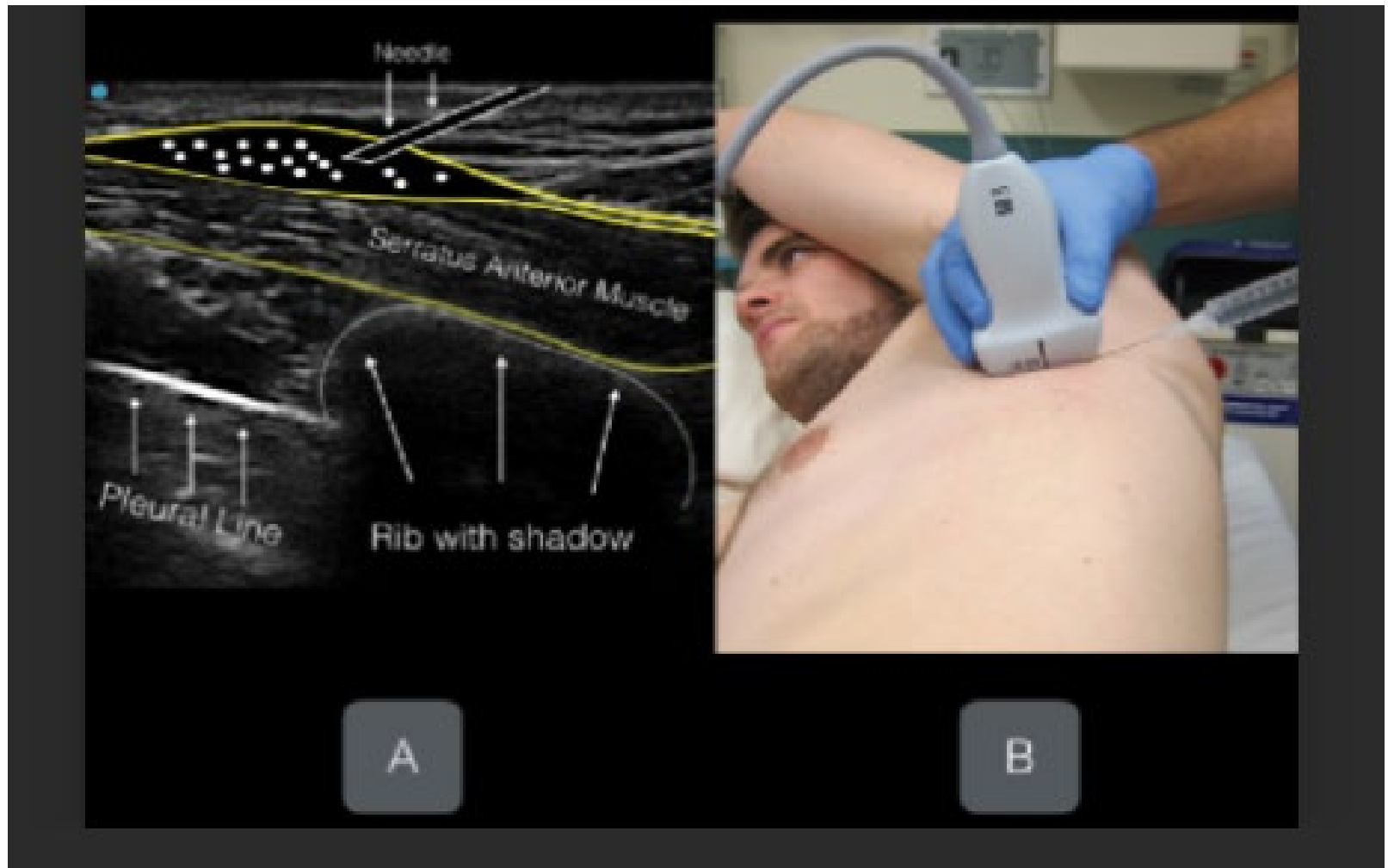


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# Serratus Plane Block









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Case Reports

➤ [Turk J Emerg Med. 2022 Jan 20;22\(1\):51-53. doi: 10.4103/2452-2473.336](#)

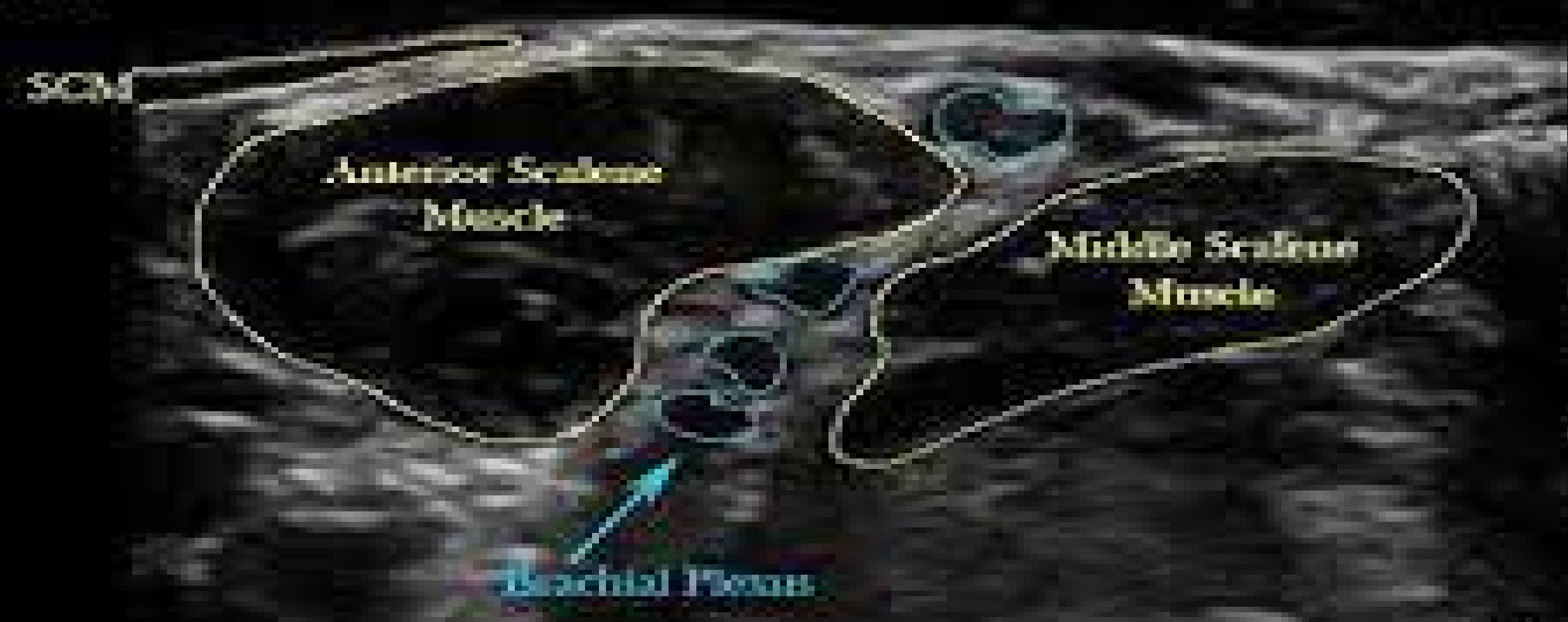
eCollection 2022 Jan-Mar.

# **Bilateral continuous serratus anterior plane block An effective alternative for bilateral multiple rib fracture analgesia**

Anju Gupta <sup>1</sup>, Aasim Ahmed <sup>1</sup>, Amit Kumar Malviya <sup>1</sup>

Medial

Lateral





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Randomized Controlled Trial

➤ *Minerva Anesthesiol.* 2021 May;87(5):523-532.

doi: 10.23736/S0375-9393.21.14865-5. Epub 2021 Feb 16.

# Superficial cervical plexus block alone or combined with interscalene brachial plexus block in surgery for clavicle fractures: a randomized clinical trial

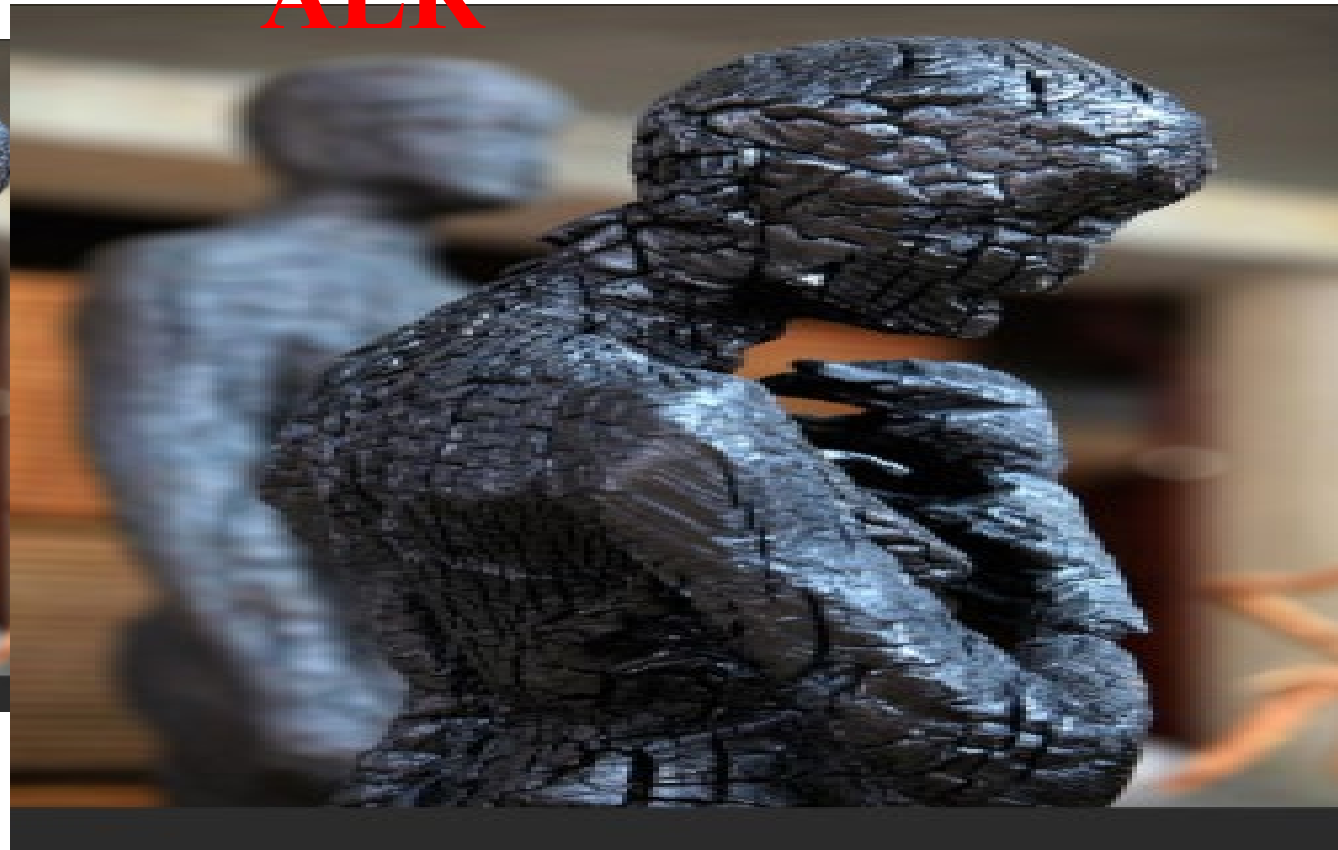
Mohamed S Abdelghany <sup>1</sup>, Sameh A Ahmed <sup>2</sup>, Mohamed E Afandy <sup>1</sup>



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# PAZIENTE USTIONATO E ALR





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**We have a great responsibility to relieve pain  
by all possible appropriate means in a timely,  
efficient and effective manner**

**This is the greatest service a physician can  
provide to a patient”**



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**GRAZIE PER L'ATTENZIONE**

