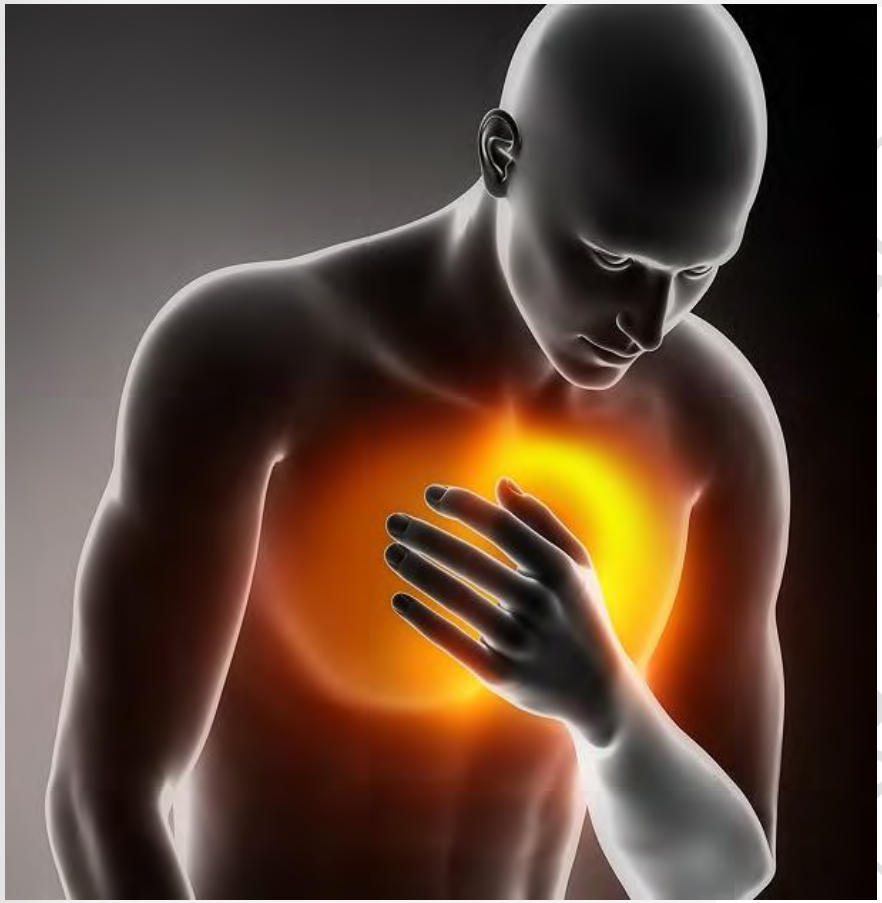
CONSORCIO
HOSPITAL GENERAL
UNIVERSITARIO
DE VALENCIA

TÉCNICAS DE ANALGESIA REGIONAL EN CIRUGÍA TORÁCICA

Dr JE Morales Sarabia MD
Dr P Kot Baixauli MD

SARTD-CHGUV Sesión de Formación Continuada
Valencia 14 de Octubre de 2019

CIRUGÍA TORÁCICA



Es uno de los procedimientos quirúrgicos **más dolorosos** que se conocen[1,2].

Puede causar **complicaciones** respiratorias como hipoxia, atelectasias o neumonía[2].

La respuesta inflamatoria y la transmisión nociceptiva provocan una sensibilización periférica (tiempo e intensidad) → central, siendo el origen de la **cronificación del dolor**[3]

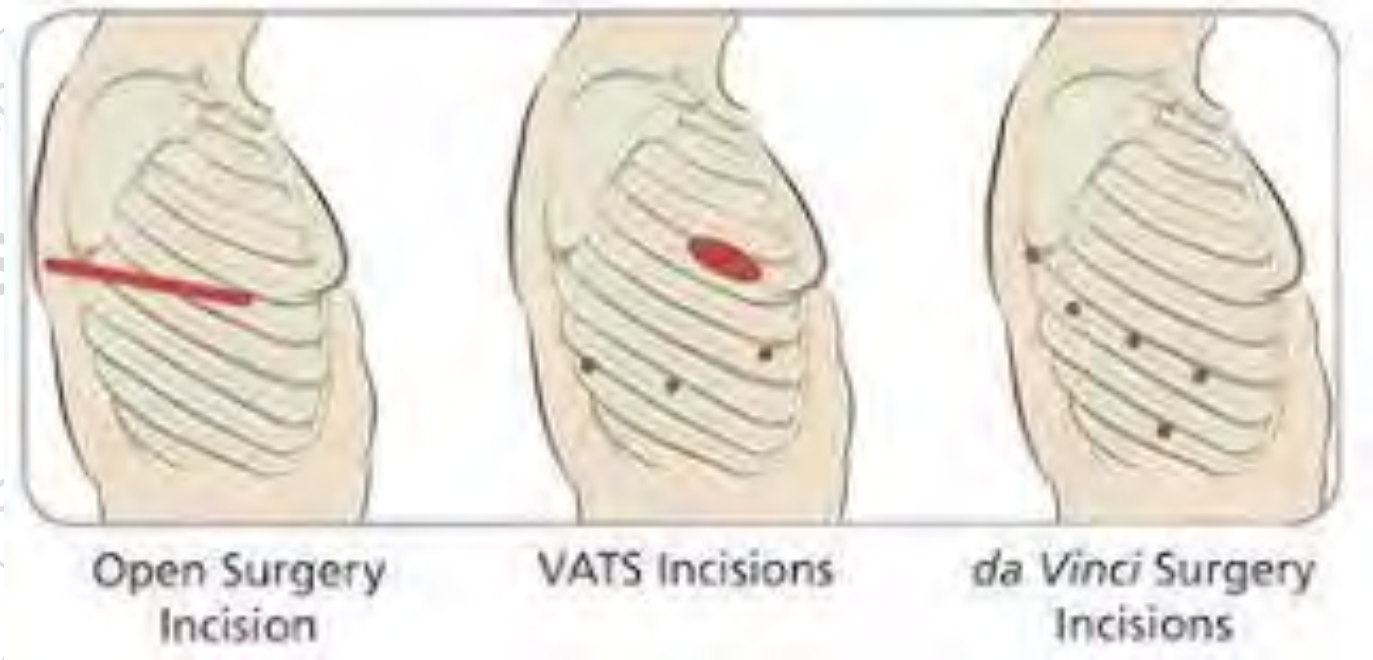
1. Rodriguez-Aldrete, el al (2016). Trends and new evidence in the management of acute and chronic post-thoracotomy pain an overview of the literature from 2005 to 2015. *J of cardiothoracic and vasc anest 30*(3), 762-772.
2. Goto, T. (2018). What is the best pain control after thoracic surgery?. *Journal of thoracic disease*, *10*(3), 1335.
3. J. E. Morales Sarabia, J. de Andrés Ibáñez, R. Guijarro Jorge y M. Granell Gil. Dolor crónico tras la cirugía torácica. Prevención y tratamiento. Anestesia y Reanimación en cirugía torácica. 6 Ed. Panamericana 2019.

CIRUGÍA TORÁCICA

Toracotomía → VATS → Robótica

ERAS

Analgesia



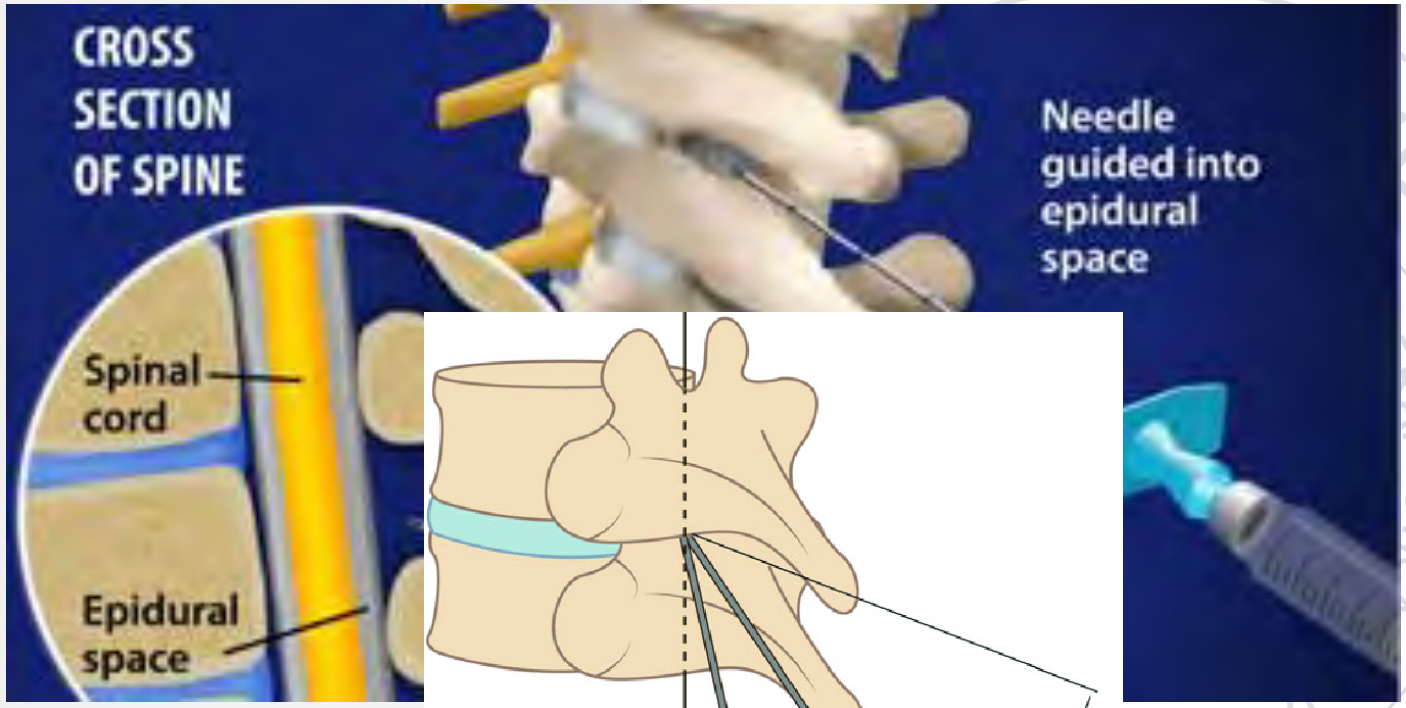
CIRUGÍA TORÁCICA

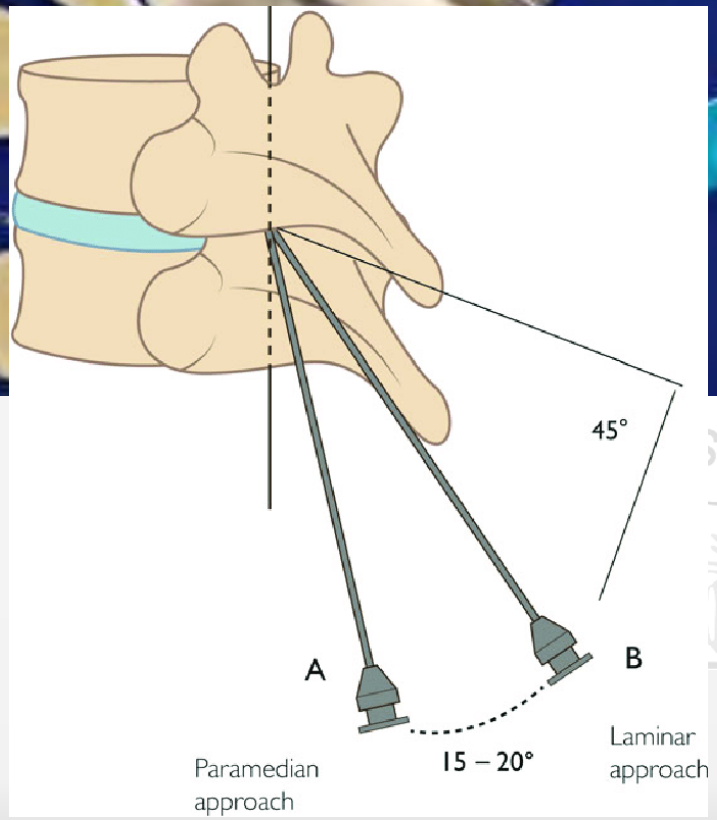
Estrategias Analgesia

- Opioides IV
- AINEs
- Analgesia Regional
- Ketamina
- Gabapentinoides ¿?

ÍNDICE

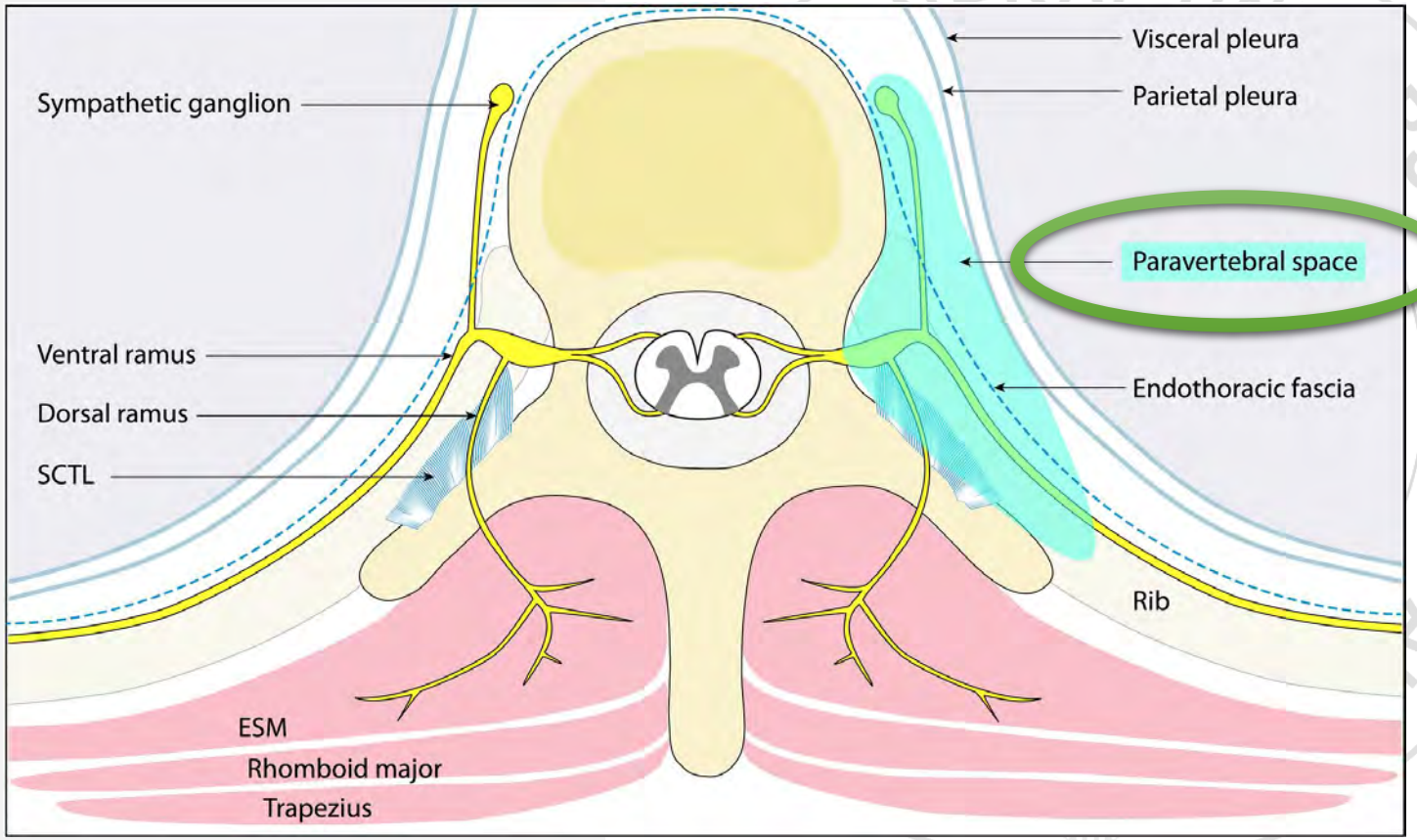
EPIDURAL TORÁCICA





Paciente en sedestación
Espacio epidural
Pérdida resistencia
Colocación catéter
Médula, espinosas, distribución grasa
Enfoque

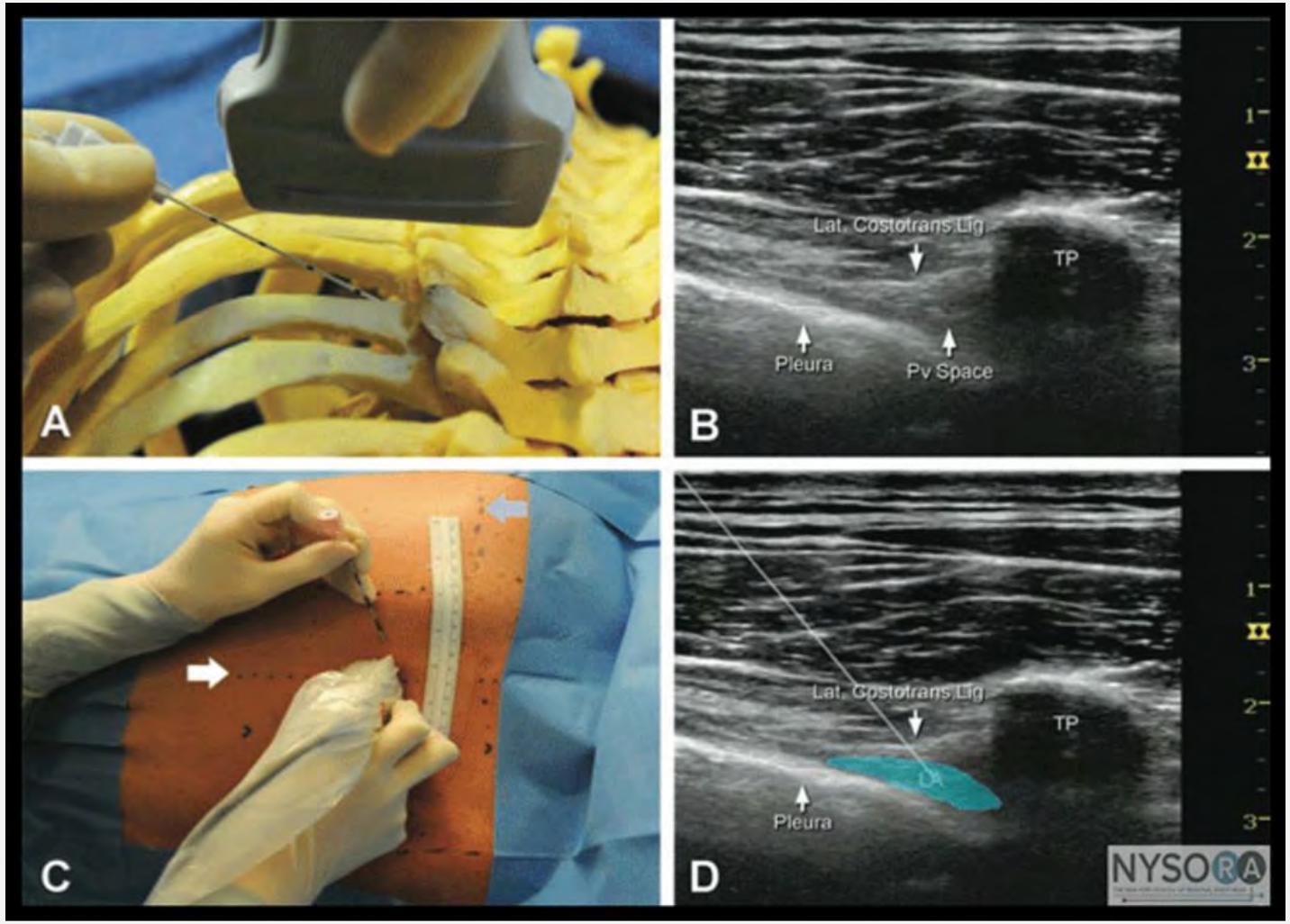
PARAVERTEBRAL



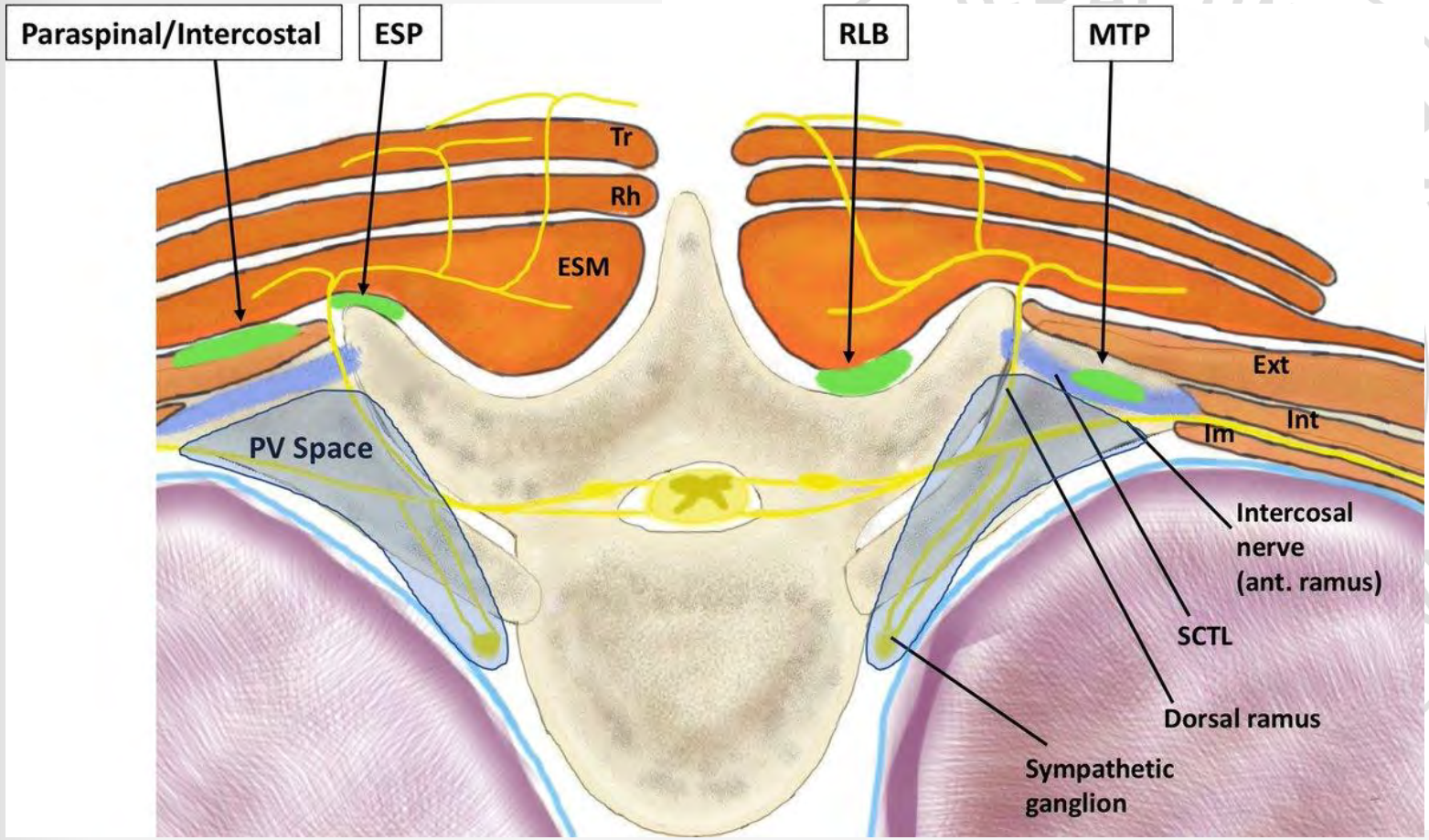
Paciente en sedestación, decúbito lateral/prono
Espacio paravertebral
Ecoguiado
Pérdida resistencia
Colocación catéter
Pleura

D'Ercole, F., Arora, H., & Kumar, P. A. (2018). Paravertebral block for thoracic surgery. *Journal of cardiothoracic and vascular anesthesia*, *32*(2), 915-927.

PARAVERTEBRAL

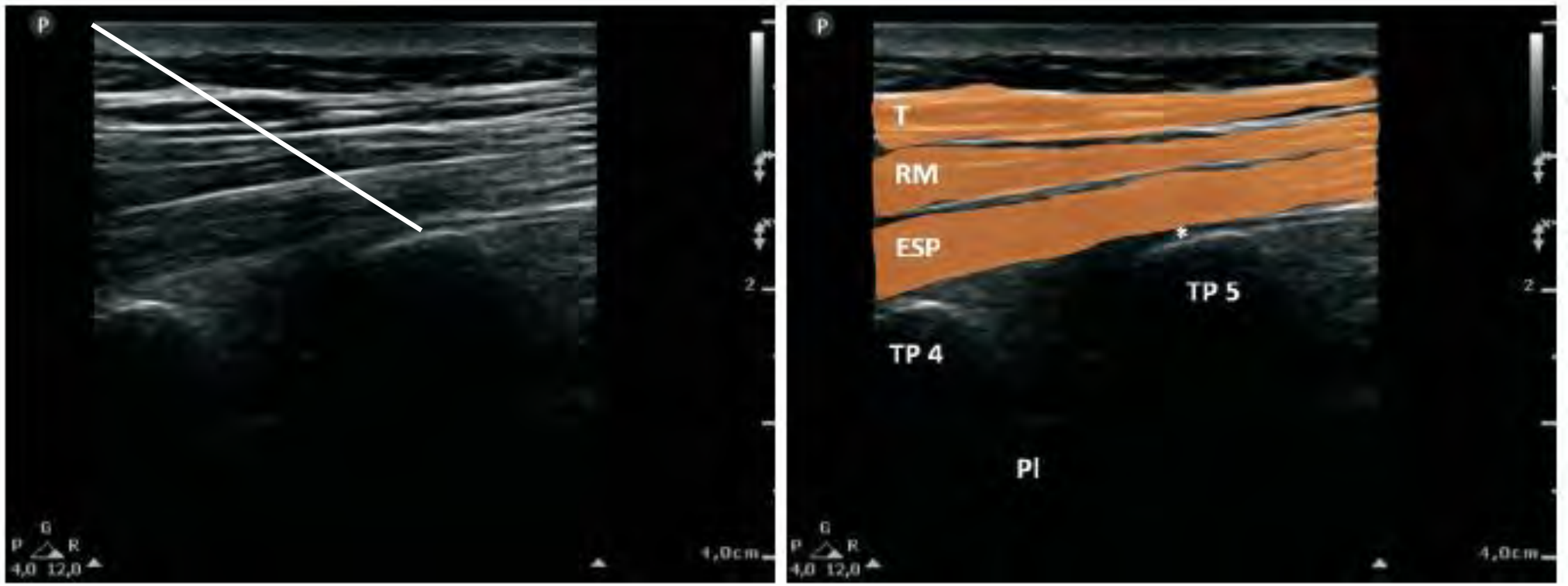


Fascial Blocks



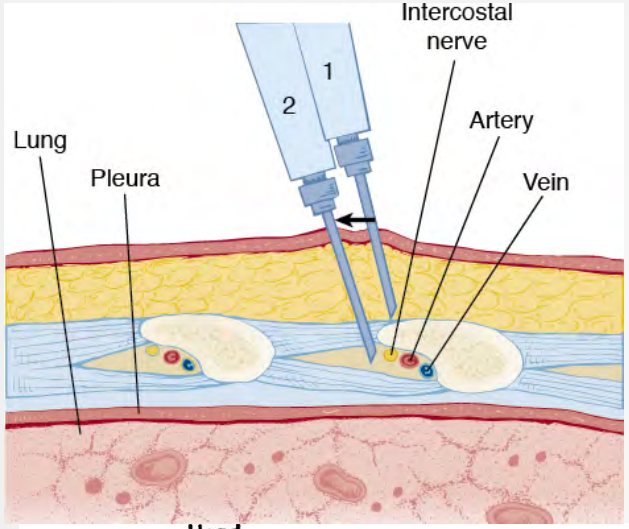
Paciente en sedestación, decúbito lateral/prono
Target variable
Ecoguiado
Ramos ventrales, dorsales y PVB
Fácil, seguro, alternativa
Catéter vs SS

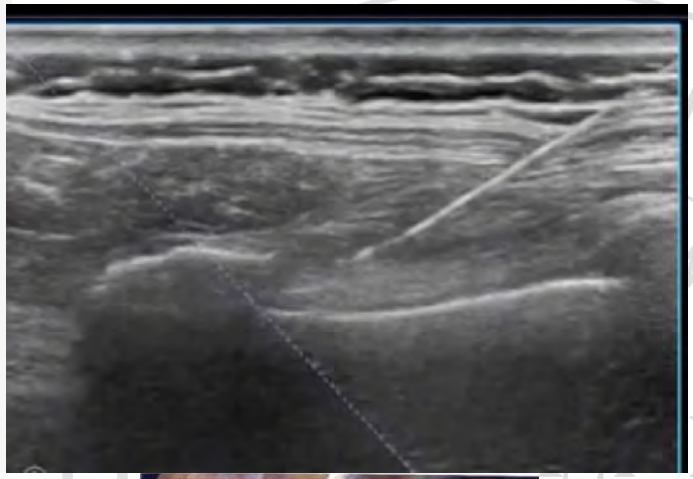
Fascial Blocks

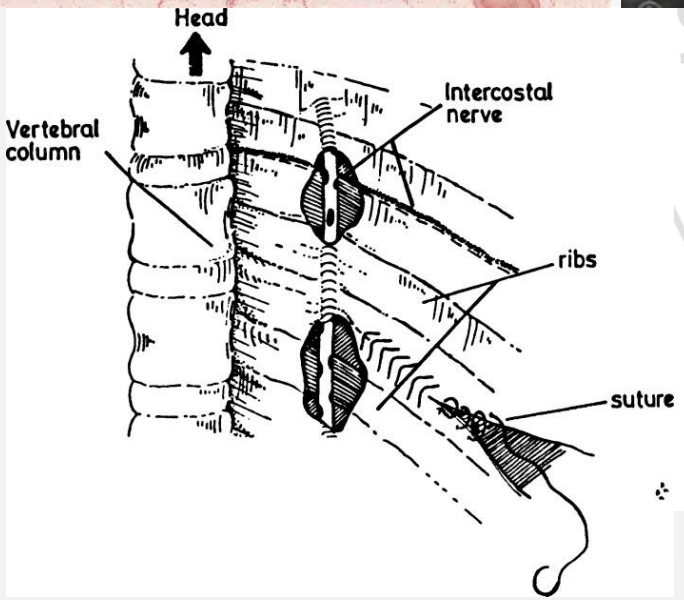


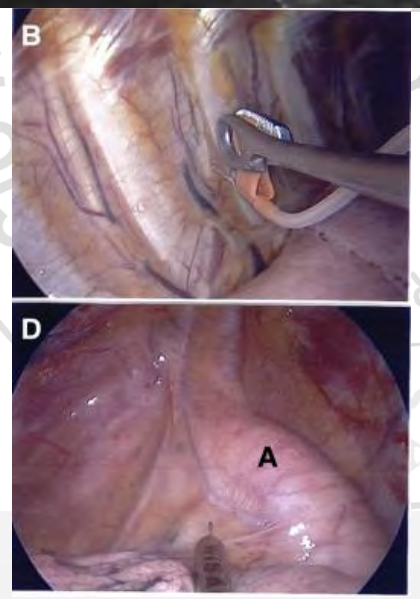
Kot, P., Rodriguez, P., Granell, M., Cano, B., Rovira, L., Morales, J., Broseta, A. & De Andrés, J. (2019). The erector spinae plane block: a narrative review. *Korean journal of anesthesiology*, *72*(3), 209.

BLOQUEO INTERCOSTAL





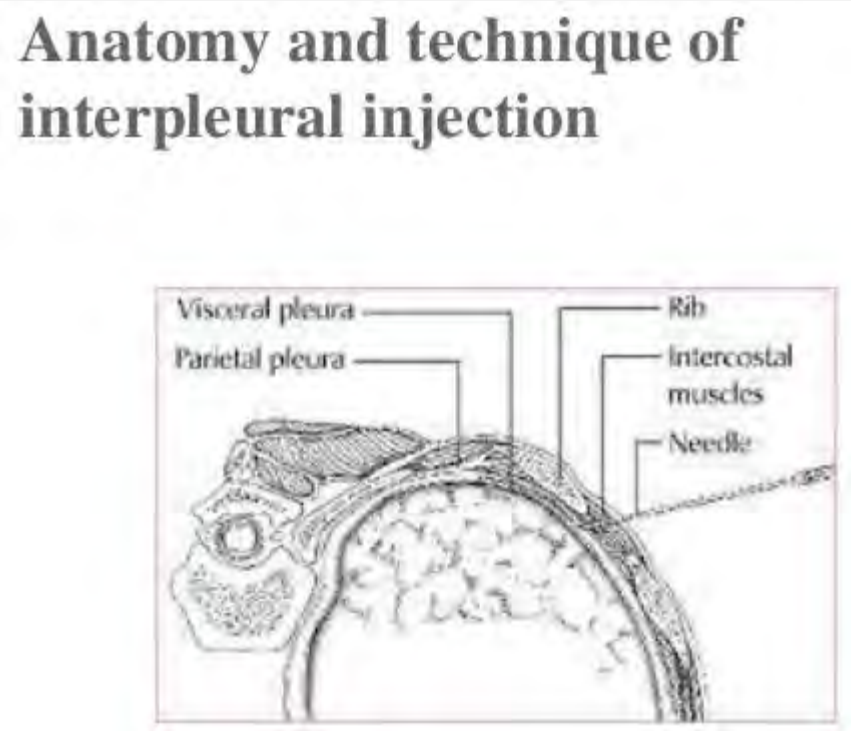




Técnica fácil de realizar
Por palpación, ecografía
o intraoperatorio por CIR
SS o catéter
Las complicaciones son raras
Bloquear 2 espacios superiores
e inferiores a la incisión

De Cosmo, G., Aceto, P., Gualtieri, E., & Congedo, E. (2009). Analgesia in thoracic surgery. *Minerva anest*, *75*(6), 393.

BLOQUEO INTRAPLEURAL



Inyección AL entre pleura visceral y parietal
Inyección simple o catéter
Puede realizarse por el anestesista o por el cirujano en el intraoperatorio
Parte del tratamiento se puede perder por el drenaje torácico

Bachmann-Mennenga, B., Biscoping, J., Kuhn, D. F. M., Schürg, R., Ryan, B., Erkens, U., & Hempelmann, G. (1993). Intercostal nerve block, interpleural analgesia, thoracic epidural block or systemic opioid application for pain relief after thoracotomy?. *European journal of cardio-thoracic surgery*, *7*(1), 12-18.

SilomonM,ClausT,HuwerH,BiedlerA,LarsenR,Molter G. Interpleural analgersia does not influence postthoracot- my pain. Anaesth Analg 2000;91:44-50.

CRIOANALGESIA

THE LANCET
Volume 308, Issue 7992, 30 October 1976, Pages 932-934

CRYOANALGESIA: A NEW APPROACH TO PAIN RELIEF

J.W. Lloyd [1], J.D.W. Barnard [2], C.J. Glynn

Show more

https://doi.org/10.1016/S0140-6736(76)90893-X

Intraoperative Intercostal Nerve Freezing to Prevent Postthoracotomy Pain

K. M. Nelson, M.D., R. G. Vincent, M.D., R. S. Bourke, M.D., D. E. Smith, M.D., W. R. Blakeley, M.D., R. J. Kaplan, M.D., and M. Pollay, M.D.

ABSTRACT Intraoperative intercostal nerve freezing has been found to improve coughing and deep breathing and reduce the need for narcotics postoperatively. The incision is rendered anesthetic, and the procedure does not require repetition. This technique avoids the possible complications of other methods used to relieve thoracotomy pain.

CRIOANALGESIA

2 minutos a -60/65ºC
Lesión neuronal
Preserva al arquitectura celular neuronal
Recuperación total sin secuelas
Analgesia de larga duración
Intraoperatoria (no invasivo)

ÍNDICE

CRIOANALGESIA

Reducción significativa en LOS, estancia UCI, el uso total de opiaceos. Sin embargo tuvieron una tasa mayor de complicaciones postoperatorias comparado con epidural[6].

Se ha descrito aumento de incidencia de neuralgia crónica[13]

6. Keller, Benjamin A., et al. "Intercostal nerve cryoablation versus thoracic epidural catheters for postoperative analgesia following pectus excavatum repair: Preliminary outcomes in twenty-six cryoablation patients." Journal of pediatric surgery 51.12 (2016): 2033-2038.

13. De Cosmo, G., Aceto, P., Gualtieri, E., & Congedo, E. (2009). Analgesia in thoracic surgery. *Minerva anest*, *75*(6), 393.

BLOQUEO INTRAPLEURAL

En contraste con otras técnicas analgésicas, el 70% de los pacientes sometidos a analgesia intrapleural necesitó terapia suplementaria con opiaceos en los estudios. Dada la insuficiente evidencia a favor del bloqueo, la técnica se fue abandonando a favor de bloqueos como TEA y PVB.

Kruger, M. (1999). Is interpleural analgesia better than thoracic epidural analgesia after thoracotomy?. *Journal of cardiothoracic and vascular anesthesia*, *13*(5), 653.

Bachmann-Mennenga, B., Biscoping, J., Kuhn, D. F. M., Schürg, R., Ryan, B., Erkens, U., & Hempelmann, G. (1993). Intercostal nerve block, interpleural analgesia, thoracic epidural block or systemic opioid application for pain relief after thoracotomy?. *European journal of cardio-thoracic surgery*, *7*(1), 12-18.

SilomonM,ClausT,HuwerH,BiedlerA,LarsenR,Molter G. Interpleural analgersia does not influence postthoracot- my pain. Anaesth Analg 2000;91:44-50.

BLOQUEO INTERCOSTAL

El bloqueo intercostal continuo puede ser efectivo en el dolor post-toracotomía, con un adecuado control analgésico y ausencia de efectos secundarios asociados con la TEA (prurito, NVPO o retención urinaria)[14]

Las complicaciones (como neumotórax) son raras, sin embargo la rápida y elevada absorción de la zona puede provocar toxicidad por AL[13]

14. Richardson, J., Sabanathan, S., Eng, J., Mearns, A. J., Rogers, C., Evans, C. S., ... & Majid, M. R. (1993). Continuous intercostal nerve block versus epidural morphine for postthoracotomy analgesia. *The Annals of thoracic surgery*, *55*(2), 377-380.

13. De Cosmo, G., Aceto, P., Gualtieri, E., & Congedo, E. (2009). Analgesia in thoracic surgery. *Minerva anest*, *75*(6), 393.

Fascial Blocks

Table 1. Reported Cases of ESP Block

Pain	Region	Intervention	N	Level	SS vs. Catheter	Side	Local anesthetic	Average NRS*	Complications	Notes
Chronic	Cervical	Neuropathic pain [8]	1	T2	1SS	1UL	B	0	No	Plus S
	Upper limbs	Shoulder pain [9]	1	T2–T3	1SS	1UL	B, R	0.3	No	Plus S+ times
	Thorax	Neuropathic pain [1,8,10–16]	17	T2–T6	13SS/4C	17UL	B, R, LB	1.4	No	Plus S [11,15] + times [14,15] Bilevel [13]
	Abdomen	Post-surgical visceral pain [17]	1	T10	1SS	1UL	B	-	No	MRI study
	Lower limbs	Zoster [18], CRPS [19]	2	L3–L4	1SS/1C	2UL	B + L, R	2	No	Plus S
Acute	Cervical	Spine surgery [20]	2	T2–T3	2SS	2BL	LB	-	No	-
		CEA [21]	2	T2–T3	2SS	2UL	LB	-	No	Anesthesia
		Burn [22], zoster [23]	2	T2	1SS/1C	2UL	B + L, LB	0	No	Plus S [23]
	Upper limbs	Amputation [24]	1	C6	1C	1UL	R	0	No	-
	Thorax	Breast surgery [8,25–38]	30	T4–T5	23SS/7C	27UL/3BL	B, R, LB, B + L, R + M, B Lip	0.9	Incomplete analgesia [26] Pneumothorax [38]	Anesthesia [30–32] Plus S [31] Combined blockade [25–27]
		VATS [1,8,39–45]	26	T5	4SS/22C	25UL/1BL	B, R, LB, B + L, R + L	1.6	No	Pediatric [45]
		Rib fractures [7,29,46–48]	9	T3/T5/T8	3SS/6C	8UL/1BL	B, R, LB	2.3	No	Fluoroscopic guidance [7]
		Thoracotomy [49–59]	17	T5/T6/T9	6SS/11C	15UL/2BL	B, R, LB	2.2	No	Pediatric [56–59]
		Costal Wall surgery [60–65]	8	T1/T2/T4/T5/T8	8SS	6UL/2BL	B, B + L	0.3	No	Pediatric [63–65] + times [60] Anesthesia [61,62]
		Valve surgery [66,67]	3	T2/T3/T7	2SS/1C	3UL	B, LB	3	No	-
		Spine surgery [68,69]	3	T4/T5	3SS	3BL	B, LB	-	No	Interfascial Rhomboid-ESM [69]
	Abdomen	Laparoscopy surgery [70–76]	18	T7–T9/T11	2SS/1C	6UL/2BL	B, R, B + L	1.3	No	Plus S [72] Pediatric [73–75]
		Open surgery [76–84]	16	T7–T9/T11/T12	11SS/5C	6UL/10BL	B, R, B + L	2.1	Motor blockade [79]	Pediatric [84]
		Abdominal Wall surgery [8,32,76,85–91]	23	T6–T10/L1	11SS/5C	6UL/10BL	B, R, B + L, L	2.3	No	Pediatric [89–91] + times [88] Anesthesia [85,86] No USG [85]
		Spine surgery [92,93]	7	T10/T12	4SS/3C	7BL	B, R, LB	0.1	No	Plus S [92,93] Plus DXM [92]
		Miscellanea [94–97]	4	T6/T8/T10	3SS/1C	2UL/2BL	B, R, B + L	2	No	Pancreatitis [94], zoster [95], fracture [96], nephrolithotomy [97]
	Lower limbs	Hip surgery [98–102]	17	T12/L4	14SS/3C	17UL	R, B + L	3	No	Pediatric [100] Anesthesia [99] Combined blockade [99]
		Thigh lift surgery [103]	1	L2	1SS	1BI	R	0	No	-

SS: single Shot, C: catheter, NRS: numbering rating scale, UL: unilateral, BL: bilateral, B: bupivacaine, R: ropivacaine, LB: levobupivacaine, L: lidocaine, M: mepivacaine, Lip: liposomal, S: steroids, DXM: dexmedetomidine, MRI: magnetic resonance imaging, CRPS: complex regional pain syndrome, CEA: carotid endarterectomy, VATS: video-assisted thoracoscopic surgery, ICU: intensive care unit. *PLACC or CHPPS scales in pediatric surgery.

Kot, P., Rodriguez, P., Granell, M., Cano, B., Rovira, L., Morales, J., Broseta, A. & De Andrés, J. (2019). The erector spinae plane block: a narrative review. *Korean journal of anesthesiology*, *72*(3), 209.

Fascial Blocks

Table 2. Reported Studies of ESP Block

	Type of study	Intervention	N	Groups	NRS	Opioid consumption	Conclusion
Tulgar et al. [104]	RCT	Laparoscopic Cholecystectomy	30	ESPB vs. control	0–3 h: 1.00 ± 1.13 vs. 2.88 ± 1.79 (P < 0.01)	Fentanyl use: 6.66 ± 11.44 μg vs. 32.33 ± 22.69 μg (P < 0.001)	Bilateral ultrasound guided ESPB leads to effective analgesia and a decrease in opioid requirement in first 12 h
Gürkan et al. [105]	RCT	Breast surgery	50	ESPB vs. control	No statistically significant difference	Morphine at 24 h: 5.76 ± 3.80 mg vs. 16.60 ± 6.92 mg (P < 0.001)	ESPB exhibits a significant analgesic effect in patients undergoing breast cancer surgery.
Oksuz et al. [106]	RCT	Breast surgery	43	ESPB vs. Tumescent anesthesia	0–24 h, all NRS of the ESPB group were significantly lower (P < 0.001)	Tramadol: 122.00 ± 56.74 mg vs. 196.00 ± 67.30 mg (P < 0.05)	Bilateral ESPB in breast reduction surgery was more effective than tumescent anesthesia concerning opioid consumption and pain scores.
Altiparmak et al. [107]	RCT	Breast surgery	38	ESPB vs. PECS	1–24 h, all NRS of the PECS group were significantly lower [illegible]	Tramadol: 196.00 ± 27.03 mg vs. 132.78 ± 22.94 mg [illegible]	Modified PECS block reduced postoperative tramadol consumption and pain scores more effectively than ESPB after radical mastectomy.
Nagaraja et al. [108]	RCT	Cardiac surgery	50	ESPB vs. TEA	0–12 h comparable NRS in both groups. 24–48 h NRS of the ESPB group were significantly lower (P < 0.05)		ESPB is a promising alternative to TEA in optimal perioperative pain management in cardiac surgery.
Krishna et al. [109]	RCT	Cardiac surgery	106	ESPB vs. control	0–24 h, all NRS of the ESPB group were significantly lower (P < 0.001)	Fentanyl use: 82.92 ± 4.29 μg vs. 214.25 ± 5.09 μg (P < 0.001)	ESPB provided significantly better pain relief for longer duration as compared to intravenous paracetamol and tramadol.
Macaire et al. [110]	CBAS	Cardiac surgery	67	ESPB vs. control	2 h after chest tube removal 1 [0–2] vs. 2 [1.5–2.5], and 1 month after surgery 0.5 [0–3] vs. 2 [1–4] (P < 0.05)	Morphine in the first 48 h 0 [0–0] mg vs. 40 [25–45] mg [illegible]	ESPB is associated with a significant decrease in intraoperative and postoperative opioid consumption, optimized rapid patient mobilization, and chest tube removal after open cardiac surgery.
Tulgar et al. [111]	POS	Thoracotomy	12	Single level vs. Bilevel	First 12 h 2.66 [0–6] vs. 1.05 [1–3]	Tramadol (mg/day) 146.6 [100–270] vs. 60 [30–140]	Bi-level ESPB may possibly have an improved effect for postoperative analgesia when compared to conventional single level ESPB
Ueshima et al. [112]	ROS	Lumbar spine surgery	41	ESPB vs. control	0–24 h, all NRS of the ESPB group were significantly lower (P < 0.05)	Fentanyl use: 90 [40–60] μg vs. 100 [80–100] μg (P < 0.05)	ESPB provides effective postoperative analgesic effect for 24 hours in patients undergoing lumbar spinal surgery.

NRS: numbering rating scale, RCT: randomized controlled trial, CBAS: controlled before-and-after study, POS: prospective observational study, ROS: retrospective observational study, ESPB: erector spinae plane block, PECS: pectoral nerve block, TEA: thoracic epidural analgesia.

Kot, P., Rodriguez, P., Granell, M., Cano, B., Rovira, L., Morales, J., Broseta, A. & De Andrés, J. (2019). The erector spinae plane block: a narrative review. *Korean journal of anesthesiology*, *72*(3), 209.


PVB
TEA

PVB VS TEA

British Journal of Anaesthesia 96 (4): 418–26 (2006)
doi:10.1093/bja/ael020 Advance Access publication February 13, 2006

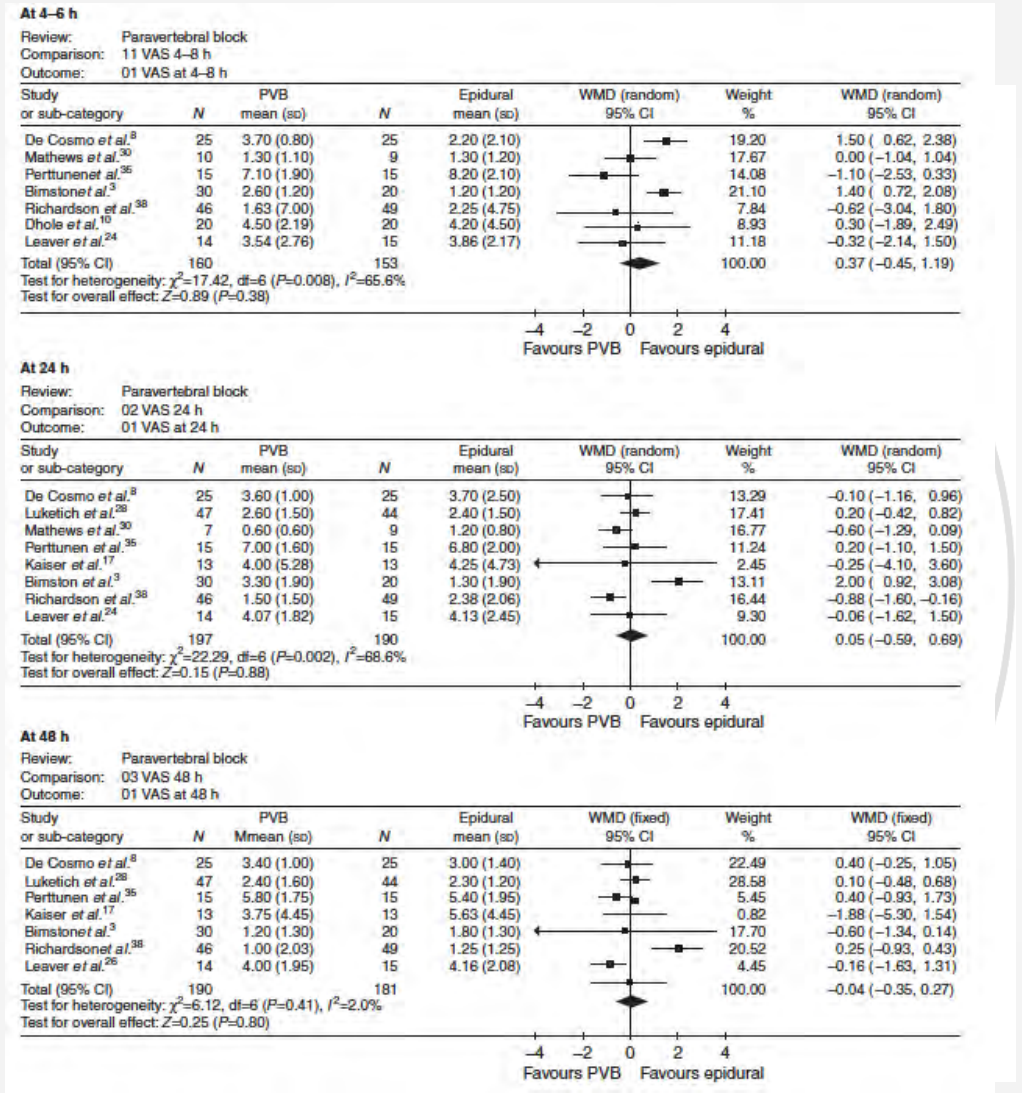
BJA

REVIEW ARTICLE

A comparison of the analgesic efficacy and side-effects of paravertebral *vs* epidural blockade for thoracotomy—a systematic review and meta-analysis of randomized trials

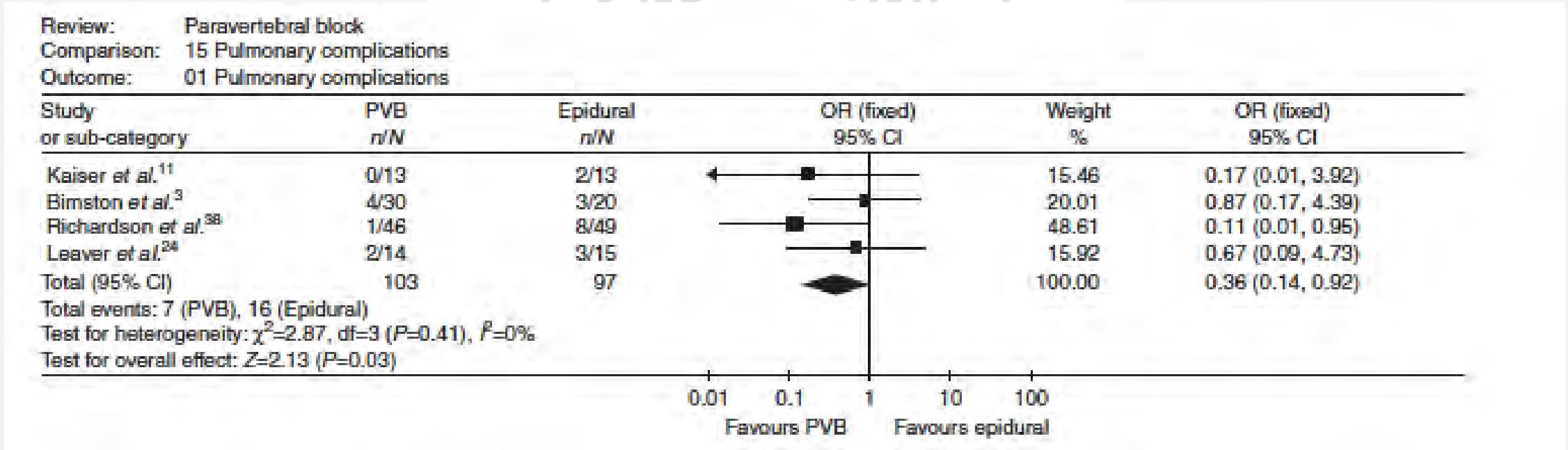
R. G. Davies[1], P. S. Myles[1 2 3]* and J. M. Graham[4]

PVB VS TEA



Davies, R. G., Myles, P. S., & Graham, J. M. (2006). A comparison of the analgesic efficacy and side-effects of paravertebral vs epidural blockade for thoracotomy—a systematic review and meta-analysis of randomized trials. *BJA: British Journal of Anaesthesia*, *96*(4), 418-426.

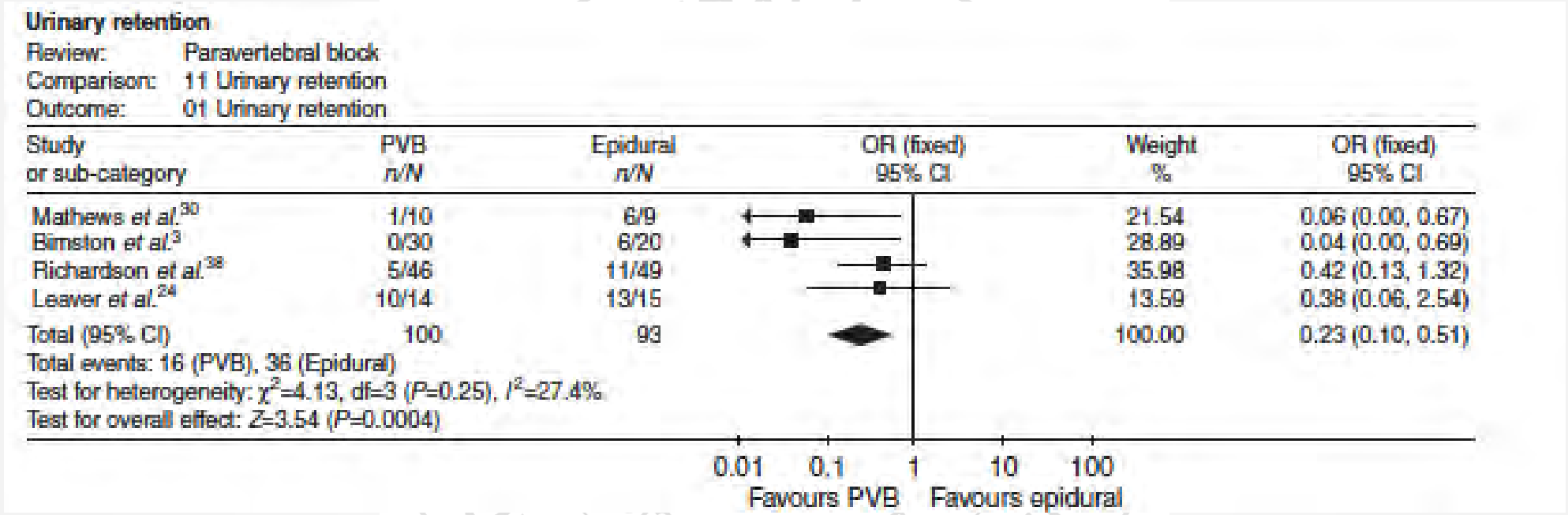
PVB VS TEA



Complicaciones pulmonares

Davies, R. G., Myles, P. S., & Graham, J. M. (2006). A comparison of the analgesic efficacy and side-effects of paravertebral vs epidural blockade for thoracotomy—a systematic review and meta-analysis of randomized trials. *BJA: British Journal of Anaesthesia*, *96*(4), 418-426.

PVB VS TEA



Retención urinaria

Davies, R. G., Myles, P. S., & Graham, J. M. (2006). A comparison of the analgesic efficacy and side-effects of paravertebral vs epidural blockade for thoracotomy—a systematic review and meta-analysis of randomized trials. *BJA: British Journal of Anaesthesia*, *96*(4), 418-426.

PVB VS TEA

Nausea and vomiting

Review: Paravertebral block
Comparison: 12 nausea or vomiting
Outcome: 01 nausea or vomiting

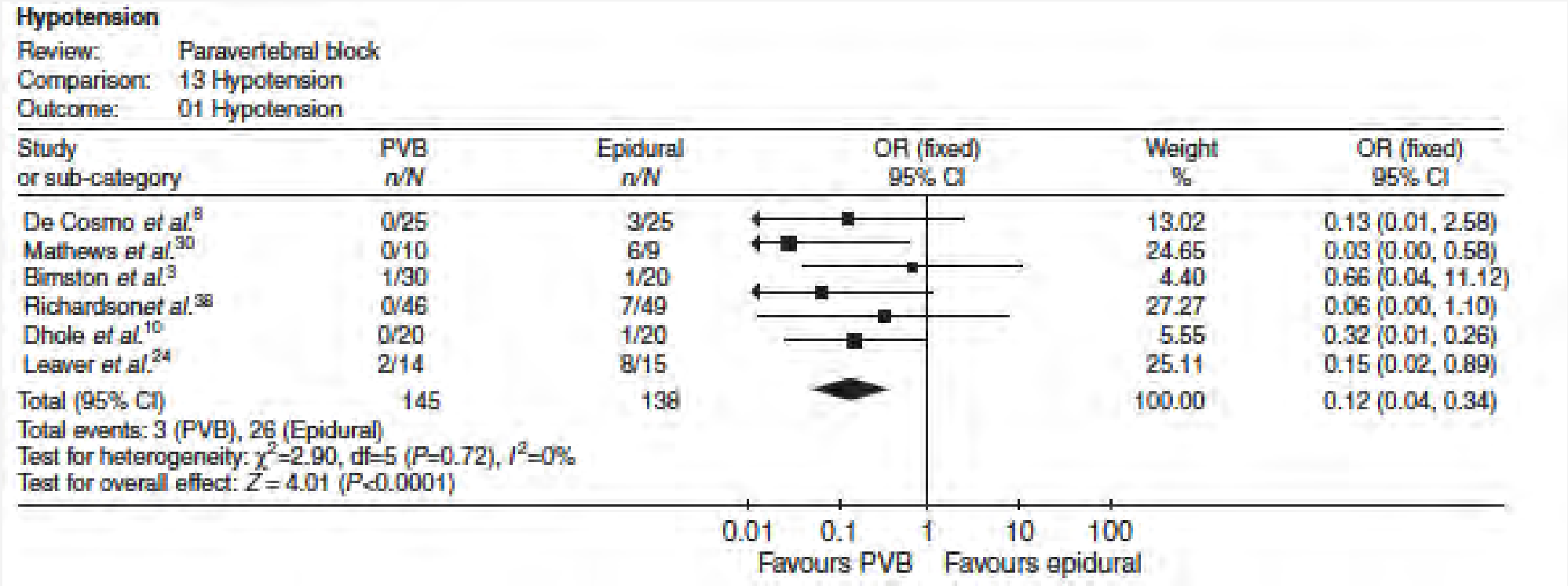
Study or sub-category	PVB n/N	Epidural n/N	OR (fixed) 95% CI	Weight %	OR (fixed) 95% CI
De Cosmo *et al.*[8]	0/25	2/25		9.95	0.18 (0.01, 4.04)
Perttunen *et al.*[35]	3/15	5/15		16.24	0.50 (0.10, 2.63)
Bimston *et al.*[3]	7/30	7/20		26.14	0.57 (0.16, 1.97)
Richardson *et al.*[38]	2/46	10/49		37.60	0.18 (0.04, 0.86)
Leaver *et al.*[24]	5/14	4/15		10.08	1.53 (0.31, 7.44)
Total (95% CI)	130	124		100.00	0.47 (0.24, 0.93)

Total events: 17 (PVB), 28 (Epidural)
Test for heterogeneity: χ^2=4.04, df=4 (P=0.40), I^2=1.1%
Test for overall effect: Z=2.17 (P=0.03)

NVPO

Davies, R. G., Myles, P. S., & Graham, J. M. (2006). A comparison of the analgesic efficacy and side-effects of paravertebral vs epidural blockade for thoracotomy—a systematic review and meta-analysis of randomized trials. *BJA: British Journal of Anaesthesia*, *96*(4), 418-426.

PVB VS TEA



Hypotension
Review: Paravertebral block
Comparison: 13 Hypotension
Outcome: 01 Hypotension

Study or sub-category	PVB n/N	Epidural n/N	OR (fixed) 95% CI	Weight %	OR (fixed) 95% CI
De Cosmo *et al.*[8]	0/25	3/25		13.02	0.13 (0.01, 2.58)
Mathews *et al.*[30]	0/10	6/9		24.65	0.03 (0.00, 0.58)
Bimston *et al.*[3]	1/30	1/20		4.40	0.66 (0.04, 11.12)
Richardson*et al.*[38]	0/46	7/49		27.27	0.06 (0.00, 1.10)
Dhole *et al.*[10]	0/20	1/20		5.55	0.32 (0.01, 0.26)
Leaver *et al.*[24]	2/14	8/15		25.11	0.15 (0.02, 0.89)
Total (95% CI)	145	138		100.00	0.12 (0.04, 0.34)

Total events: 3 (PVB), 26 (Epidural)
Test for heterogeneity: χ^2=2.90, df=5 (P=0.72), I^2=0%
Test for overall effect: Z = 4.01 (P<0.0001)

0.01 0.1 1 10 100
Favours PVB Favours epidural

HipoTA

Davies, R. G., Myles, P. S., & Graham, J. M. (2006). A comparison of the analgesic efficacy and side-effects of paravertebral vs epidural blockade for thoracotomy—a systematic review and meta-analysis of randomized trials. *BJA: British Journal of Anaesthesia*, *96*(4), 418-426.

PVB VS TEA

El éxito del bloqueo paravertebral depende de la experiencia del operador, progresar el catéter no es sencillo y la tasa de fallos puede ser mayor que la TEA

Las complicaciones menores de la TEA descrita en los estudios se debe probablemente al uso inapropiado de fármacos. La combinación de opioides y AL reduce el ratio de complicaciones de la epidural[16]

16. De Andrés J., Morales JE, Sentürk M. Change in gold standard of thoracic epidural analgesia in thoracic surgery. Anesthesia in thoracic surgery. Springer 2019

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DOLOR CRÓNICO TRAS CTO

Narrative Review

PAIN

The IASP classification of chronic pain chronic postsurgical or posttraumatic p

Stephan A. Schug[a], Patricia Lavand'homme[b], Antonia Barke[c], Beatrice Korwisi[c], Winfr
Rolf-Detlef Treede[d,*], The IASP Taskforce for the Classification of Chronic Pain

Table 1

Incidence of chronic postsurgical pain (CPSP), severe CPSP, and the proportion of neuropathic pain in CPSP.

Type of surgery	Incidence of all CPSP	Incidence of severe CPSP (>5/10 of 10/10)	Proportion of neuropathic pain in CPSP
Abdominal surgery (bowel and colorectal)	17%-21%	Not reported	Not reported
Amputation	30%-85%	5%-10%	80%
Caesarean delivery	6%-55%	5%-10%	50%
Cholecystectomy	3%-50%	Not reported	Not reported
Craniotomy	7%-30%	25%	Not reported
Dental surgery	5%-13%	Not reported	Not reported
Hip arthroplasty	27%	6%	1%-2%
Inguinal herniotomy	5%-63%	2%-4%	80%
arthroplasty	13%-44%	15%	6%
noma resection	9%	Not reported	Not reported
tectomy	11%-57%	5%-10%	65%
acotomy	5%-65%	10%	45%
ctomy	0%-37%	Not reported	Not reported

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Review Article

Paravertebral Block for Thoracic Surgery

Francine D'Ercole, MD*, Harendra Arora, MD*,†,
Priya A. Kumar, MD*,†,‡

landmark, ultrasound-guided, or stimulation-based PVB approaches. Moreover, the efficacy of TEA compared with PVB in preventing post-thoracotomy chronic pain syndrome has not been investigated thoroughly and requires future clinical trials.

DOLOR CRÓNICO TRAS CTO

¿Cuál es la incidencia de DCPCTM en nuestro medio?

¿Cuánto componente neuropático?

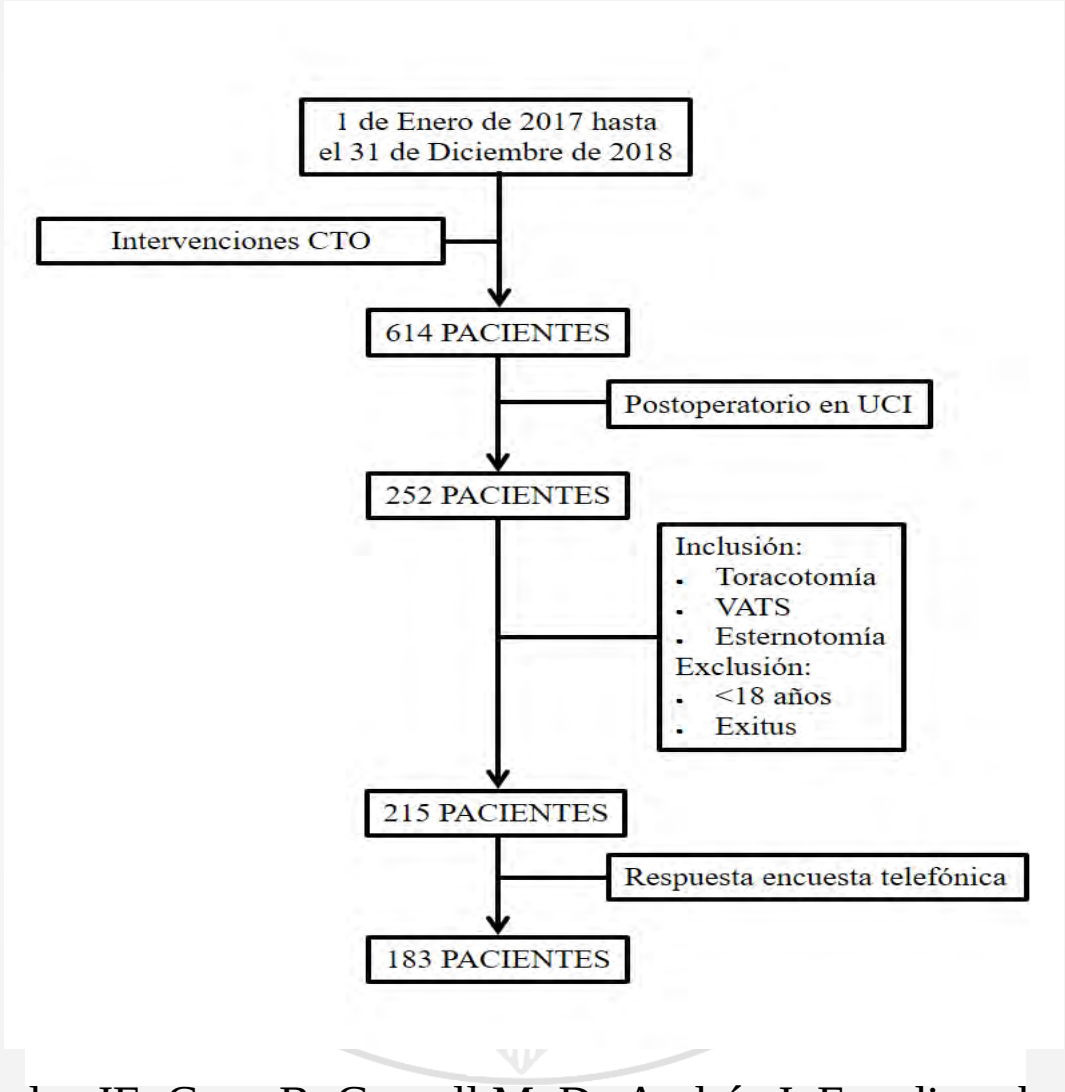
¿Qué técnica regional empleamos más?

¿Existen diferencias en la incidencia dolor crónico en función de técnica quirúrgica?

…¿y en función de la edad, sexo, dolor agudo..?

¿Existen diferencias en la incidencia dolor crónico en función de técnica analgésica?

DOLOR CRÓNICO TRAS CTO



Kot P, Rovira L, Rodríguez P, Morales JE, Cano B, Granell M, De Andrés J. Estudio sobre pacientes intervenidos de cirugía torácica. Incidencia de dolor crónico e influencia del tipo de analgesia intraoperatoria. 25 Congreso anual ESRA España

DOLOR CRÓNICO TRAS CTO

Tabla 1	
Descripción variables de los pacientes. Frecuencias absolutas, medias , porcentajes, IC95%	
N	183
Edad	62,80 [60,92-64,67]
Sexo (Hombres/Mujeres)	131/52
Intervención	
• Toracotomía	94 (51,36%)
• VATS	87 (47,54%)
• Esternotomía	2 (1,3%)
Técnica analgésica	
• Epidural	101 (56,11%)
• Paravertebral	40 (22,22%)
• Opioides	35 (19,44%)
• Bloqueo intercostal	2 (1,11%)
• ESPB	2 (1,11%)
EVA postoperatorio	2,94 [2,46-3,41]
Dolor Crónico (SI/NO)	59/124
EVA actual	4 [3,48-4,49]

Kot P, Rovira L, Rodríguez P, Morales JE, Cano B, Granell M, De Andrés J. Estudio sobre pacientes intervenidos de cirugía torácica. Incidencia de dolor crónico e influencia del tipo de analgesia intraoperatoria. 25 Congreso anual ESRA España

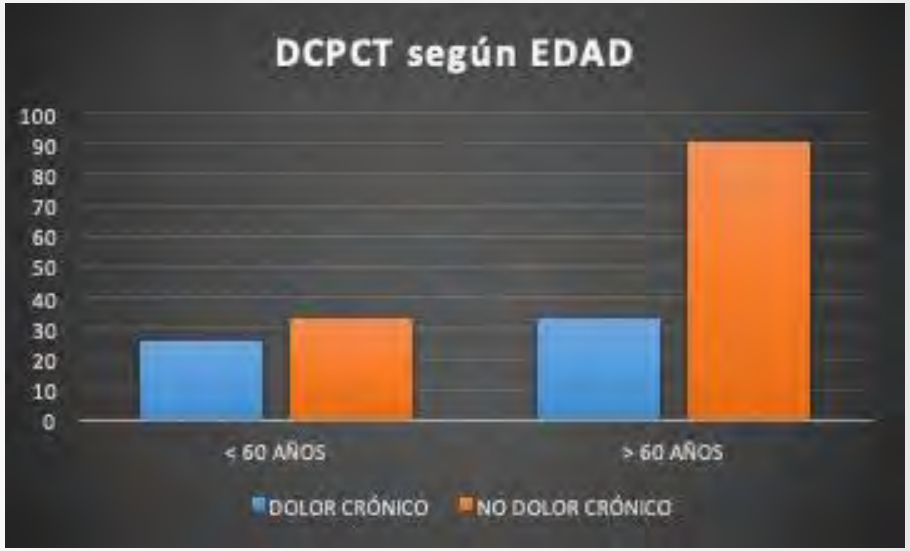
DOLOR CRÓNICO TRAS CTO

SEXO: El riesgo de padecer dolor crónico en esta muestra fue mayor en mujeres (40,38%) que en hombres (29,01%), no siendo significativo: OR 1.39 IC95% [0,91-2,13].

EDAD: El riesgo de padecer dolor crónico en los menores de 60 años fue del 44,07%, y en los mayores de 60 años del 26,61%; teniendo los menores de 60 años un 17,45% [2.6-32] de mayor riesgo: OR 2.163 [1.12-4,17] (p=0,01)

LRG vs Opioides: mismo riesgo de padecer dolor crónico empleándose analgesia loco-regional (32.35%) frente al manejo con opioides (32,41%). La incidencia de dolor neuropático fue del 31,9% cuando se empleó analgesia LRG frente al 33,3% cuando se empleó analgesia con opioides.

EVA agudo → crónico: El riesgo de padecer dolor crónico con valores EVA bajos (<4) frente a valores altos (>4) fue de 33.87% vs 31,4% (p=0,36). Sin correlación (Pearson 0.07)



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DOLOR CRÓNICO TRAS CTO

ABORDAJE QX: En relación a la técnica quirúrgica, el riesgo de padecer dolor crónico en los sometidos a toracotomía fue del 40,42%, y en los sometidos a VATS del 22,99%; teniendo los pacientes intervenidos por toracotomía un 17,43% [4,14-30,72] de mayor riesgo: OR 2,23 [1,18-4,38] (p=0,006).

TÉCNICA LRG: el riesgo de padecer dolor crónico en los sometidos a analgesia epidural fue del 27,72%, y en los sometidos a analgesia paravertebral del 45%; teniendo los pacientes intervenidos con ET un 17,28% menos de riesgo: OR 0,61 [0,38-0,98] (p=0,048).

Kot P, Rovira L, Rodríguez P, Morales JE, Cano B, Granell M, De Andrés J. Estudio sobre pacientes intervenidos de cirugía torácica. Incidencia de dolor crónico e influencia del tipo de analgesia intraoperatoria. 25 Congreso anual ESRA España

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ERAS

Guidelines for enhanced recovery after lung surgery: recommendations of the Enhanced Recovery After Surgery (ERAS®) Society and the European Society of Thoracic Surgeons (ESTS)

Timothy J.P. Batchelor[a,*], Neil J. Rasburn[b], Etienne Abdelnour-Berchtold[c], Alessandro Brunelli[d], Robert J. Cerfolio[e], Michel Gonzalez[c], Olle Ljungqvist[f], René H. Petersen[g], Wanda M. Popescu[h], Peter D. Slinger[i] and Babu Naidu[j]

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ERAS

Table 1: Guidelines for enhanced recovery after lung surgery: recommendations of the ERAS Society and the ESTS

Recommendations	Evidence level	Recommendation grade
Preoperative phase		
Preadmission information, education and counselling		
Patients should routinely receive dedicated preoperative counselling	Low	Strong
Perioperative nutrition		
Patients should be screened preoperatively for nutritional status and weight loss	High	Strong
Oral nutritional supplements should be given to malnourished patients	Moderate	Strong
Immune-enhancing nutrition may have a role in the malnourished patient postoperatively	Low	Weak
Smoking cessation		
Smoking should be stopped at least 4 weeks before surgery	High	Strong
Alcohol dependency management		
Alcohol consumption (in alcohol abusers) should be avoided for at least 4 weeks before surgery	Moderate	Strong
Anaemia management		
Anaemia should be identified, investigated and corrected preoperatively	High	Strong
Pulmonary rehabilitation and prehabilitation		
Prehabilitation should be considered for patients with borderline lung function or exercise capacity	Low	Strong
Admission		
Preoperative fasting and carbohydrate treatm		
Clear fluids should be allowed up until 2 h b		
6 h before induction of anaesthesia		
Oral carbohydrate loading reduces postope		
Preanaesthetic medication		
Routine administration of sedatives to redu		
Perioperative phase		
Venous thromboembolism prophylaxis		
Patients undergoing major lung resection s		
ical VTE prophylaxis		
Patients at high risk of VTE may be conside		
4 weeks		
Antibiotic prophylaxis and skin preparation		
Routine intravenous antibiotics should be a		
incision		
Hair clipping is recommended if hair removal is required	High	Strong
Chlorhexidine–alcohol is preferred to povidone-iodine solution for skin preparation	High	Strong
Preventing intraoperative hypothermia		
Maintenance of normothermia with convective active warming devices should be used perioperatively	High	Strong
Continuous measurement of core temperature for efficacy and compliance is recommended	High	Strong
Standard anaesthetic protocol		
Lung-protective strategies should be used during one-lung ventilation	Moderate	Strong
A combination of regional and general anaesthetic techniques should be used	Low	Strong
Short-acting volatile or intravenous anaesthetics, or their combination, are equivalent choices	Low	Strong
PONV control		
Non-pharmacological measures to decrease the baseline risk of PONV should be used in all patients	High	
A multimodal pharmacological approach for PONV prophylaxis is indicated in patients at mod		Moderate
Regional anaesthesia and pain relief		
Regional anaesthesia is recommended with the aim of reducing postoperative opioid use	High	Strong
Paravertebral blockade provides equivalent analgesia to epidural anaesthesia		
A combination of acetaminophen and NSAIDs should be administered regularly to all patients unless contraindications exist	High	Strong
Ketamine should be considered for patients with pre-existing chronic pain	Moderate	Strong
Dexamethasone may be administered to prevent PONV and reduce pain	Low	Strong
Very restrictive or liberal fluid regimes should be avoided in favour of euvolemia	Moderate	Strong
Balanced crystalloids are the intravenous fluid of choice and are preferred to 0.9% saline	High	Strong
Intravenous fluids should be discontinued as soon as possible and replaced with oral fluids and diet	Moderate	Strong
Atrial fibrillation prevention		
Patients taking β-blockers preoperatively should continue to take them in the postoperative period	High	Strong
Magnesium supplementation may be considered in magnesium depleted patients	Low	Weak
It is reasonable to administer diltiazem preoperatively or amiodarone postoperatively for patients at risk	Moderate	Weak
Surgical technique: thoracotomy		
If a thoracotomy is required, a muscle-sparing technique should be performed	Moderate	Strong

Continued

Regional anaesthesia and pain relief		
Regional anaesthesia is recommended with the aim of reducing postoperative opioid use.	High	Strong
Paravertebral blockade provides equivalent analgesia to epidural anaesthesia		
A combination of acetaminophen and NSAIDs should be administered regularly to all patients unless contraindications exist	High	Strong
Ketamine should be considered for patients with pre-existing chronic pain	Moderate	Strong
Dexamethasone may be administered to prevent PONV and reduce pain	Low	Strong

Batchelor, T. J., Et Al (2018). Guidelines for enhanced recovery after lung surgery: recommendations of the Enhanced Recovery After Surgery (ERAS®) Society and the European Society of Thoracic Surgeons (ESTS). *European journal of cardio-thoracic surgery*, *55*(1), 91-115.

ERAS

Summary and recommendations

A standardized multimodal approach to pain relief, including good regional anaesthesia, is recommended with the aim of reducing postoperative opioid use. Paravertebral blockade provides equivalent analgesia to TEA with evidence of a better side-effect profile. Acetaminophen and NSAIDs should be administered regularly to all patients unless contraindications exist. Dexamethasone may be administered to prevent PONV and reduce pain. Ketamine should be considered for patients with pre-existing chronic pain on long-term opiates. Gabapentin cannot currently be recommended as an adjunct to conventional analgesia.

Evidence level:
Regional anaesthesia: High.
Combination of acetaminophen and NSAIDs: High.
Ketamine: Moderate.
Dexamethasone: Low.

Recommendation grade:
Regional anaesthesia: Strong.
Combination of acetaminophen and NSAIDs: Strong.
Ketamine: Strong.
Dexamethasone: Strong.

La analgesia regional, así como el empleo de AINES, paracetamol, ketamina y dexametasona tienen un grado de recomendación fuerte en la guía ERAS de cirugía torácica.

Batchelor, T. J., Et Al (2018). Guidelines for enhanced recovery after lung surgery: recommendations of the Enhanced Recovery After Surgery (ERAS®) Society and the European Society of Thoracic Surgeons (ESTS). *European journal of cardio-thoracic surgery*, *55*(1), 91-115.

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CONCLUSIONES

La analgesia en CTO debe proporcionarse con un enfoque multimodal, en el que las técnicas regionales forman una parte fundamental.

No podemos recomendar una técnica sobre otra (como gold standar) dado que ambas tienen buenos perfiles analgésicos.

La elección de la técnica se debe basar en la experiencia del anestesista, la familiaridad con el procedimiento y las particularidades clínicas y anatómicas del paciente.

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