

STRATEGIES ANALGESIQUES EN CHIRURGIE THORACIQUE

Dr GERMAIN Arnaud
SAR 2/CHIRURGIE THORACIQUE

PLAN

- ▶ INTRODUCTION
- ▶ ENJEUX
- ▶ TECHNIQUES ANALGESIQUES
 - ▶ APD
 - ▶ KTPV
- ▶ STRATEGIES
- ▶ CONCLUSION



INTRODUCTION

- ▶ Chirurgie douloureuse
- ▶ Patients altérés
- ▶ Multiplicité des cibles possibles
 - ▶ Progrès chirurgicaux (Vidéo-thoracoscopie)
 - ▶ ALR
- ▶ Bénéfices à court, moyen et long termes
 - ▶ Douleurs
 - ▶ Complications
 - ▶ Récurrences cancéreuses





LES ENJEUX

ENJEUX

- ▶ DOULEURS:
 - ▶ Aigue
 - ▶ Chronique
- ▶ COMPLICATIONS
 - ▶ Respiratoires
 - ▶ Cardiaques
 - ▶ Emboliques
- ▶ CARCINOLOGIQUE



LA DOULEUR

- ▶ Aigue:

- ▶ Supériorité des techniques d'ALR sur l'IV
- ▶ Fortement impliquée dans les complications postopératoires
- ▶ Fait le lit de la DCPO

- ▶ Chronique:

- ▶ Environ 50% des patients en chirurgie thoracique
- ▶ Lésions quasi-systématique du nerf IC en per-opératoire
- ▶ Impact socio-professionnel important



COMPLICATIONS

Tableau II. Fréquence des principales complications médicales pulmonaires et cardiovasculaires après chirurgie thoracique (sélection de références des dix dernières années).

<i>Complications médicales</i>	<i>Type d'exérèse*</i>	<i>Fréquence (médiane et extrêmes)</i>	<i>Références</i>
Pulmonaires			
Pneumopathie	PNE/RP/RVP	7,7 % (2,0-22,0)	[2, 10-14, 17-19, 21, 22]
Insuffisance respiratoire aiguë	PNE/RP/RVP	6,75 % (2,4-17,0)	[2, 10-14, 16-18]
Atélectasie	PNE/RP	6,5 % (3,0-11,0)	[10-14, 16, 19]
Bronchospasme	PNE/RP	1,8 % (1,5-2,2)	[10, 19]
Embolie pulmonaire	PNE/RP	1,0 % (0,5-5,4 %)	[10, 11, 14, 17, 18]
SDRA	PNE/RP/RVP	1,4 % (1-3)	[10, 16, 21]
Œdème aigu du poumon	PNE/RP	2,0 % (0,4-15)	[10, 11, 13, 14, 16, 23]
Cardiovasculaires			
Troubles du rythme (supra ventriculaires en majorité)	PNE/RP	17,0 % (4,2-41,0)	[9-14, 16-18, 21, 22]
Infarctus du myocarde/Angor	PNE/RP/RVP	1,3 % (0,6-4,2)	[2, 9, 10, 12, 14, 16, 17, 21, 22]
Accident vasculaire cérébral	PNE/RP	1,0 % (1-1,7)	[10, 11, 17]

* certaines complications ne sont pas mentionnées pour certains types de chirurgie (en particulier pour la chirurgie de réduction pulmonaire).
PNE : pneumonectomie ; RP : résection partielle (lobectomie et wedge) ; RVP : réduction des volumes pulmonaires ; SDRA : syndrome de détresse respiratoire aiguë.

F. Stéphan*

Complications respiratoires :

- ▶ Modifications de la mécanique ventilatoire par la chirurgie:
 - ▶ $\simeq$ CV, $\simeq$ Vt, $\simeq$ CRF
 - ▶ Dysfonction diaphragmatique
 - ▶ Apparition dans les 24h et pouvant durer 5-7 jours.
- ▶ FDR :
 - ▶ Patient : ATCDS. Bilan fonctionnel préop.
 - ▶ Chirurgie : Ampleur de la résection. Délabrement pariétal.
 - ▶ Anesthésie : Analgésie (ALR), Ventilation perop.



Troubles du rythme

- ▶ Fréquence de TdR supra-ventriculaires : 17%
- ▶ Etiologie principalement d'origine chirurgicale:
 - ▶ Lésions des nerfs parasympathiques
 - ▶ Suture des veines pulmonaires
- ▶ Majoré par défaut d'analgésie
- ▶ Pic au 3^{ème} - 4^{ème} jour
- ▶ Peu d'influence sur la mortalité



Autres...

- ▶ Non spécifique de la chirurgie thoracique:
 - ▶ EP/TVP:
 - ▶ Contexte carcinologique
 - ▶ Retentissement rapide de l'EP sur réduction chirurgicale du lit vasculaire
 - ▶ IDM:
 - ▶ Importance de l'analgésie sur la FC
 - ▶ AVC



Effet de l'ALR

- ▶ Complications cardiovasculaires:

- ▶ Bloc sympathique

- ▶ Amélioration de la perfusion coronaire
 - ▶ Diminution de l'incidence de l'IDM postop

Beattie WS. Anesth Analg 2001

- ▶ Diminution AC/FA

Oka T. Anesth Analg 2001

- ▶ Emboliques:

- ▶ Diminution de l'incidence des thromboses PO

- ▶ Amélioration des flux sanguins
 - ▶ Normalisation de l'activité fibrinolytique, de l'aggrégabilité plaquettaire et de l'anti-thrombine III

Tuman KJ. Anesth Analg 1991



Effet de l'ALR

- ▶ Complications respiratoires:
 - ▶ Amélioration de la compliance
 - ▶ Restauration de la CRF
 - ▶ Diminution des atélectasies
 - ▶ Meilleure participation aux soins de kiné

⇒ DIMINUTION DES COMPLICATIONS RESPIRATOIRES



EFFETS sur la récurrence carcinologique ?



Immunité et ALR

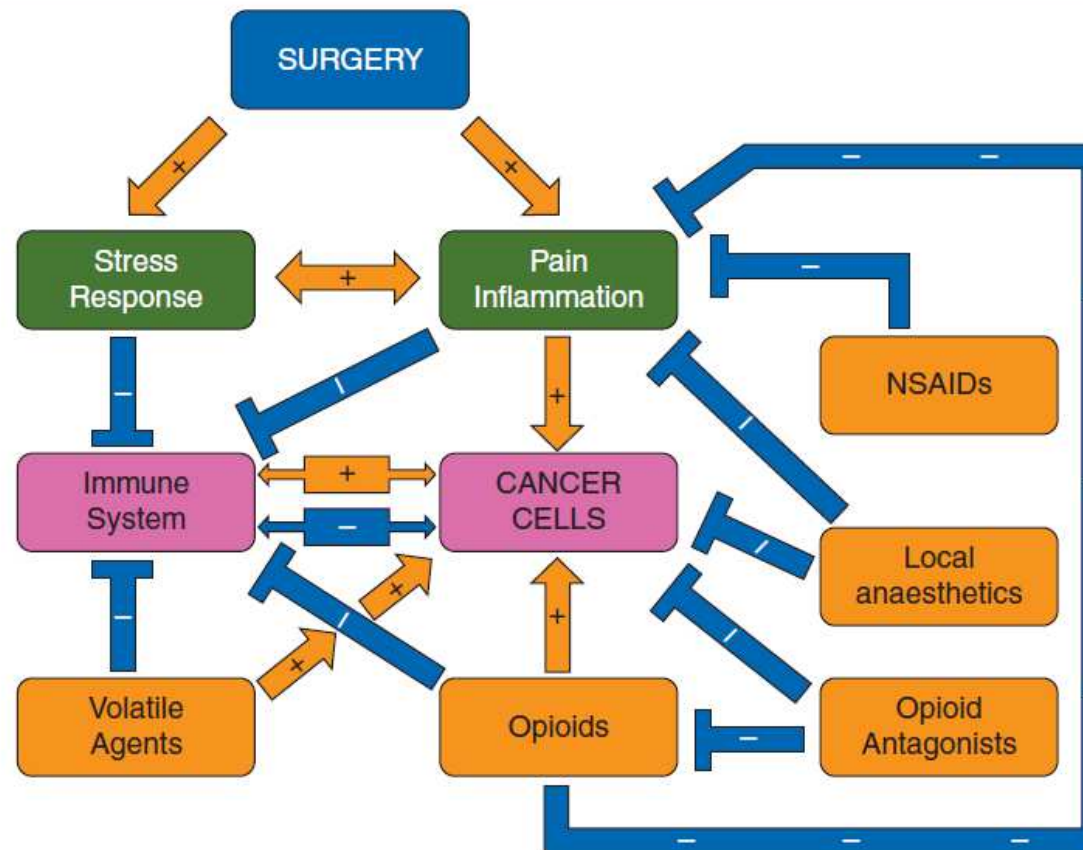
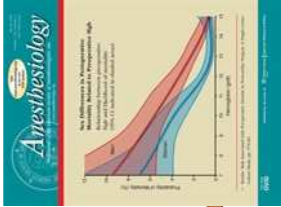


Fig 1 The complex interplay between cancer cells, the immune system, and anaesthetic agents. NSAIDs, non-steroidal anti-inflammatory drugs.



Can Anesthetic Technique for Primary Breast Cancer Surgery Affect Recurrence or Metastasis?

Aristomenis K. Exadaktylos, M.D.,* Donal J. Buggy, M.D., M.Sc., D.M.E., F.R.C.P.I., F.C.A.R.C.S.I., F.R.C.A.,†
Denis C. Moriarty, F.C.A.R.C.S.I.,‡ Edward Mascha, Ph.D.,§ Daniel I. Sessler, M.D., Ph.D.||

Table 3. Cancer Recurrence

	Paravertebral (n = 50)	General Anesthesia (n = 79)
Crude recurrence	3 (6)	19 (24)
Percent of patients recurrence-free at 24 months (95% CI)	94 (87–100)	82 (74–91)*
Percent of patients recurrence-free at 36 months (95% CI)	94 (87–100)	77 (68–87)†
Recurrence location		
Local or axillary nodes	1	11
Liver metastasis	1	3
Bone metastasis	1	3
Lung metastasis	0	2

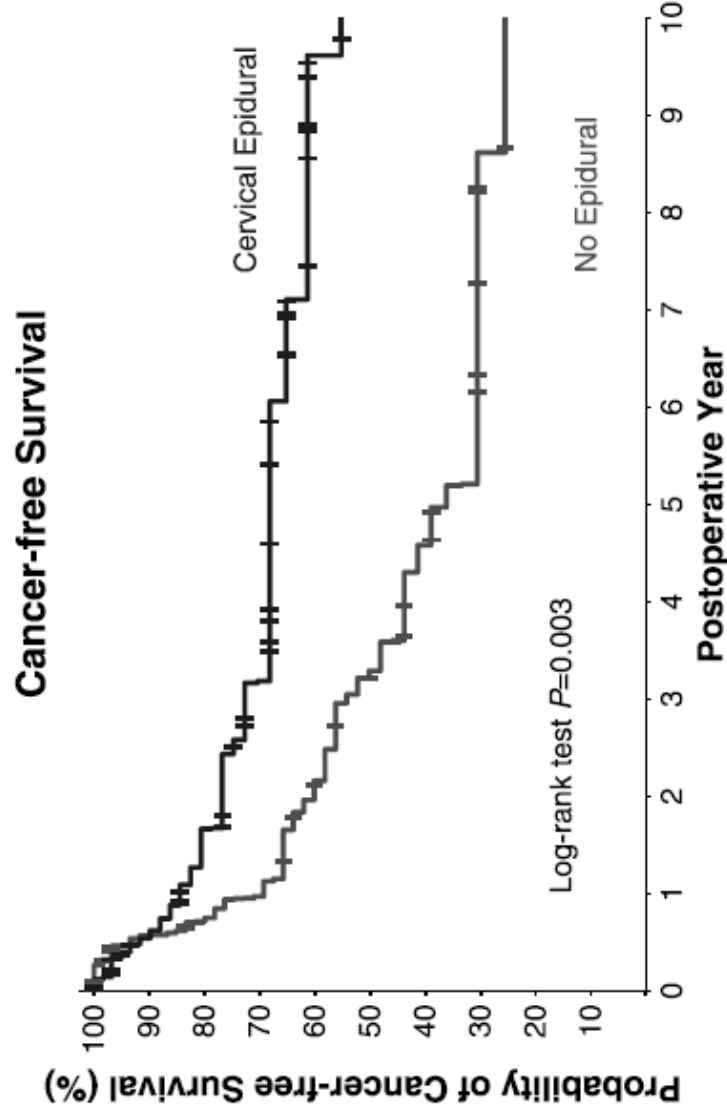
Data are number (%) or Kaplan-Meier survival estimate (95% confidence interval).

* $P = 0.038$ comparing groups on Kaplan-Meier estimates at 24 months (z test). † $P = 0.007$ comparing groups on Kaplan-Meier estimates at 36 months (z test).

Cervical Epidural Anesthesia Is Associated With Increased Cancer-Free Survival in Laryngeal and Hypopharyngeal Cancer Surgery

A Retrospective Propensity-Matched Analysis

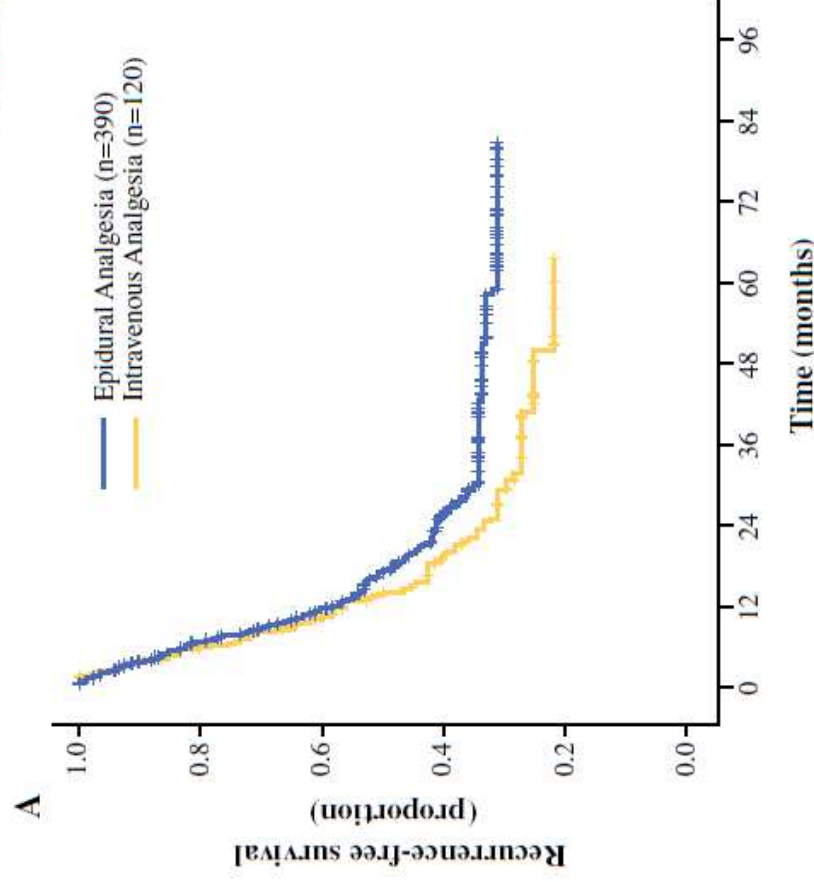
Fanette Merquiol, MD,* Anne-Sophie Montelimaud, MD,* Alice Nourissat, MD,† Serge Molliex, MD, PhD,*
and Paul Jacques Zufferey, MD, PhD*



Positive Impact of Epidural Analgesia on Oncologic Outcomes in Patients Undergoing Resection of Colorectal Liver Metastases

Giuseppe Zimmitti, MD¹, Jose Soliz, MD², Thomas A. Aloia, MD¹, Vijaya Gottumukkala, MD², Juan P. Cata, MD², Ching-Wei D. Tzeng, MD³, and Jean-Nicolas Vauthey, MD¹

Ann Surg Oncol (2016) 23:1003–1011



Annals of

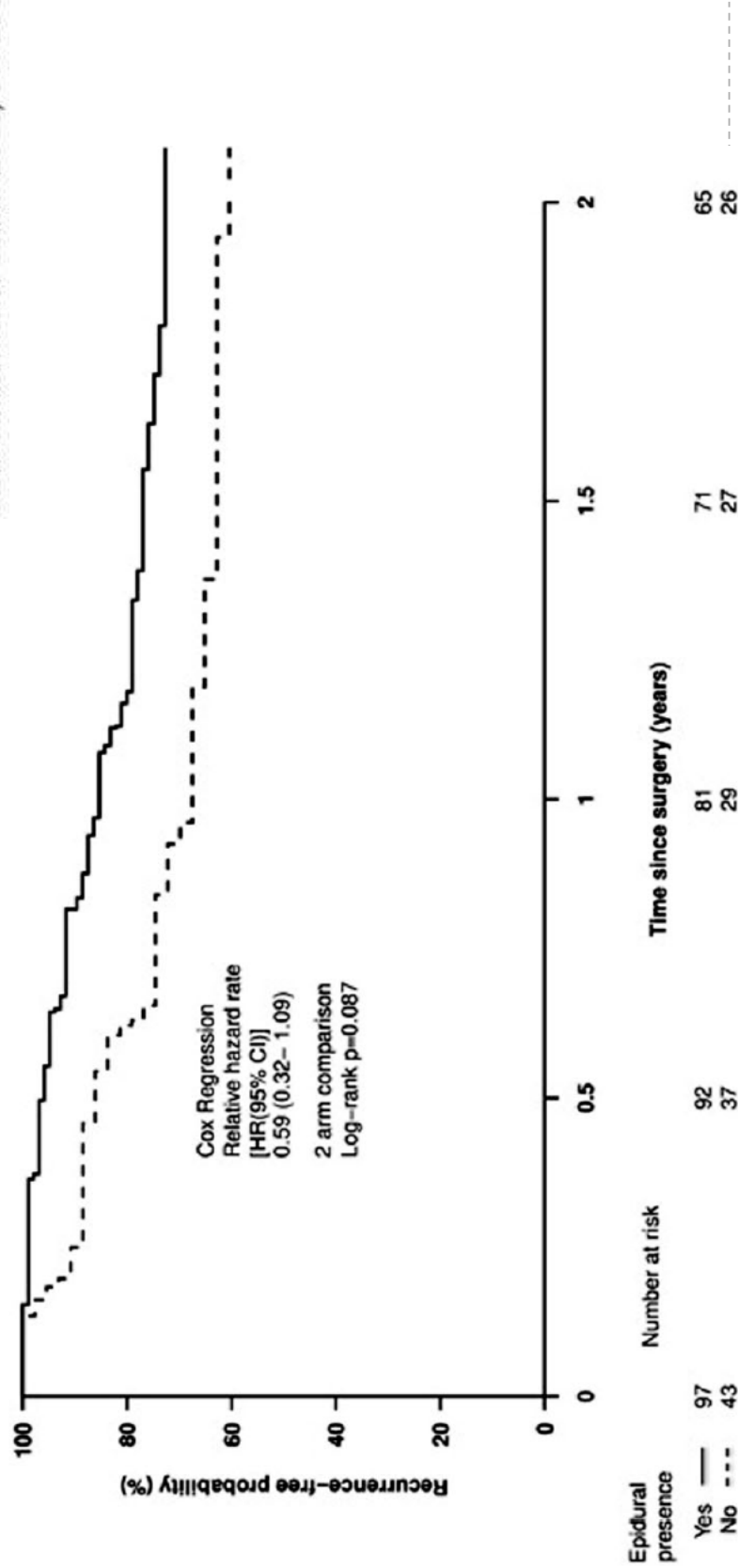
SURGICAL ONCOLOGY

OFFICIAL JOURNAL OF THE SOCIETY OF SURGICAL ONCOLOGY

Perioperative epidural analgesia reduces cancer recurrence after gastro-oesophageal surgery

J. G. HILLER^{*1,2}, M. B. HACKING¹, E. K. LINK³, K. L. WESSELS¹ and B. J. RIEDEL²

Acta Anaesthesiol Scand 2014; 58: 281–290



A Comparison of the Effects of Epidural Analgesia Versus Traditional Pain Management on Outcomes After Gastric Cancer Resection

A Population-Based Study

Kenneth C. Cummings, III, MD, MS,* Meatal Patel, MPH,† Phyvo Than Htoo, MD, MPH,†
 Paul M. Bakaki, MD, PhD,† Linda C. Cummings, MD, MS,‡ and Siran Koroukian, PhD§

TABLE 3. Association Between Type of Pain Management and Tumor Recurrence

Models*	OR	95% CI	P
Model 1A	1.38	0.98–1.95	0.06
Model 1B	1.40	0.96–2.05	0.08
Model 1C	1.37	0.97–1.93	0.07
Model 1D	1.38	0.98–1.94	0.07

Model 1A—epidural alone (unadjusted).

Model 1B—epidural adjusted by age, sex, race, marital status, education, median income, year of diagnosis, blood transfusion, Charlson score, tumor grade, stage, cancer site, and surgical complications.

Model 1C—epidural adjusted by surgical complications only (surgical complication is not predictive of recurrence in the adjusted model).

Model 1D—epidural adjusted by blood transfusion only (blood transfusion is not predictive of recurrence in the adjusted model).

*Conditional logistic regression models adjusting for hospital effect.

Association between neuraxial analgesia, cancer progression, and mortality after radical prostatectomy: a large, retrospective matched cohort study

BJA

F. Scavonetto^{1†}, T. Y. Yeoh^{1,4†}, E. C. Umbreit², T. N. Weingarten¹, M. T. Gettman², I. Frank², S. A. Boorjian², R. J. Karnes², D. R. Schroeder³, L. J. Rangel³, A. C. Hanson³, R. E. Hofer¹, D. I. Sessler⁵ and J. Sprung^{1*}

British Journal of Anaesthesia **113** (S1): i95–i102 (2014)

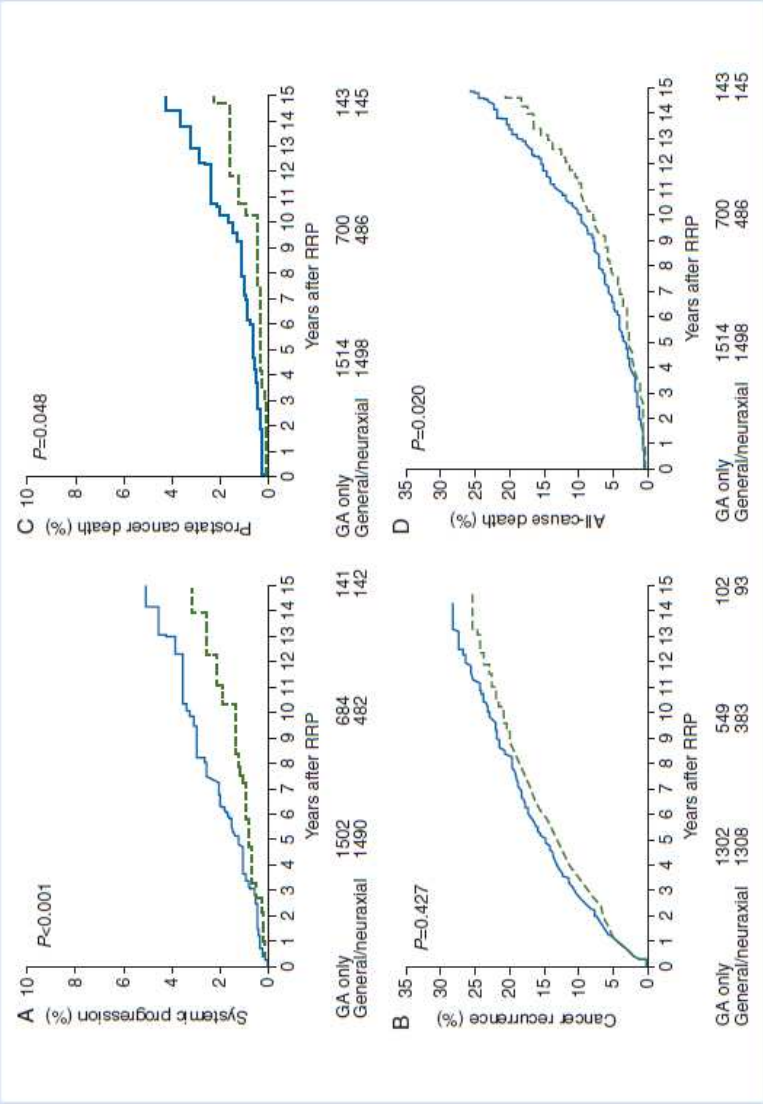
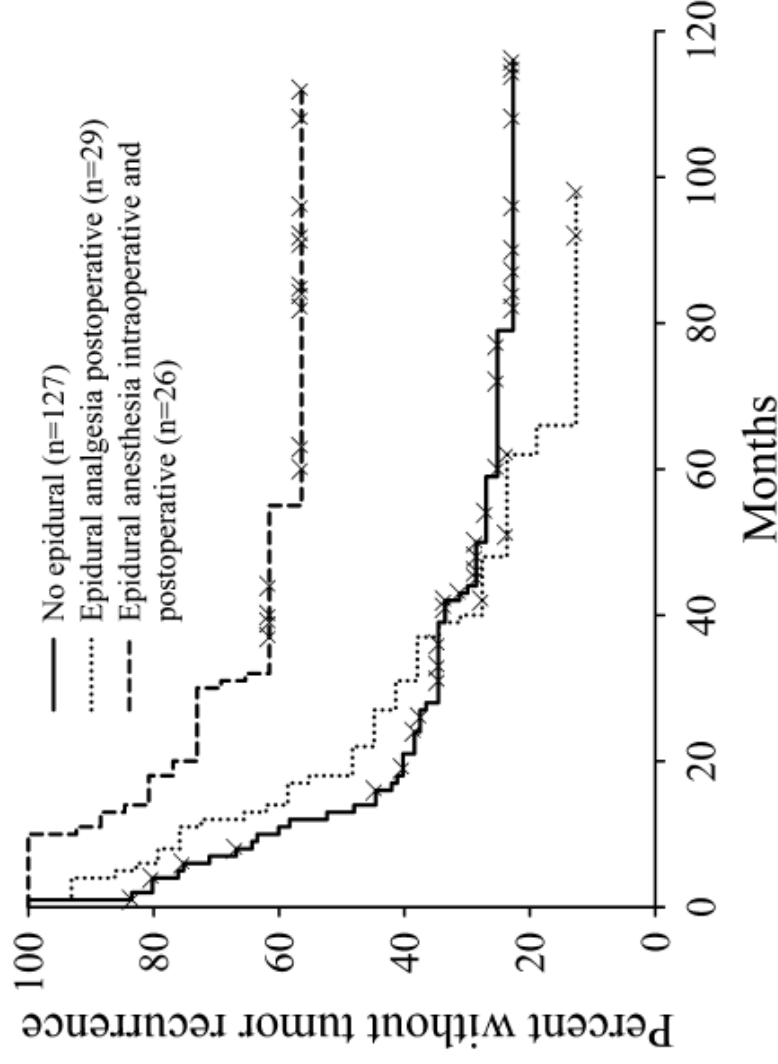


Fig 1 Cumulative percentage of patients experiencing systemic progression (A), cancer recurrence (B), prostate cancer death (C), and all-cause death (D) in patients undergoing RRP with general anaesthesia only (general only, solid line) and with general anaesthesia supplemented with neuraxial analgesia (general/neuraxial, dashed line). Numbers of patients at risk are shown at 5, 10, and 15 yr after surgery.

Intraoperative Neuraxial Anesthesia But Not Postoperative Neuraxial Analgesia Is Associated With Increased Relapse-Free Survival in Ovarian Cancer Patients After Primary Cytoreductive Surgery

Gildasio S. de Oliveira Jr, MD,* Shireen Ahmad, MD,* Julian C. Schink, MD,† Diljeet K. Singh, MD,†
Paul C. Fitzgerald, MS, RN,* and Robert J. McCarthy, PharmD*



Anaesthetic techniques for risk of malignant tumour recurrence (Review)

Cakmakaya OS, Kolodzie K, Apfel CC, Pace NL



Cochrane Database of Systematic Reviews

RCTs is inadequate to show whether regional anaesthesia might influence tumour recurrence. Clinical decisions should not be made on these grounds until additional high-level evidence data become available.

Cochrane Database of Systematic Reviews 2014, Issue 11. Art. No.: CD008877.

Trial record 1 of 10 for: epidural AND cancer recurrence

Previous Study | Return to List | Next Study

Example: "Heart attack" AND "Los Angeles"

Search for studies:

Advanced Search | Help | Studies by Topic | G

ClinicalTrials.gov

A service of the U.S. National Institutes of Health

Home: ClinicalTrials.gov

A service of the U.S. National Institutes of Health

Search for studies:

Example: "Heart attack" AND "Los Angeles"

Advanced Search | Help | Studies by Topic | G

ClinicalTrials.gov

A service of the U.S. National Institutes of Health

Search for studies:

Example: "Heart attack" AND "Los Angeles"

Advanced Search | Help | Studies by Topic | G

Trial record 8 of 10 for: epidural AND cancer recurrence

Previous Study | Return to List | Next Study

Analgesia and Pancreatic Cancer Surgery

This study is currently recruiting participants. (see Contacts and Locations)

ClinicalTrials.gov Identifier:

Verified July 2015 by National Taiwan University Hospital

NCT01929915



LES TECHNIQUES

Deux favoris...

- ▶ Anesthésie Péridurale
- ▶ Bloc Paravertébral

- ▶ Les sortants...
 - ▶ Bloc intercostal
 - ▶ Insuffisant
 - ▶ Anesthésie intrapleurale
 - ▶ Insuffisant
 - ▶ Et dangereux!
 - ▶ Rachi-analgésie
 - ▶ Durée trop courte
 - ▶ Sensibilisation/hyperalgésie

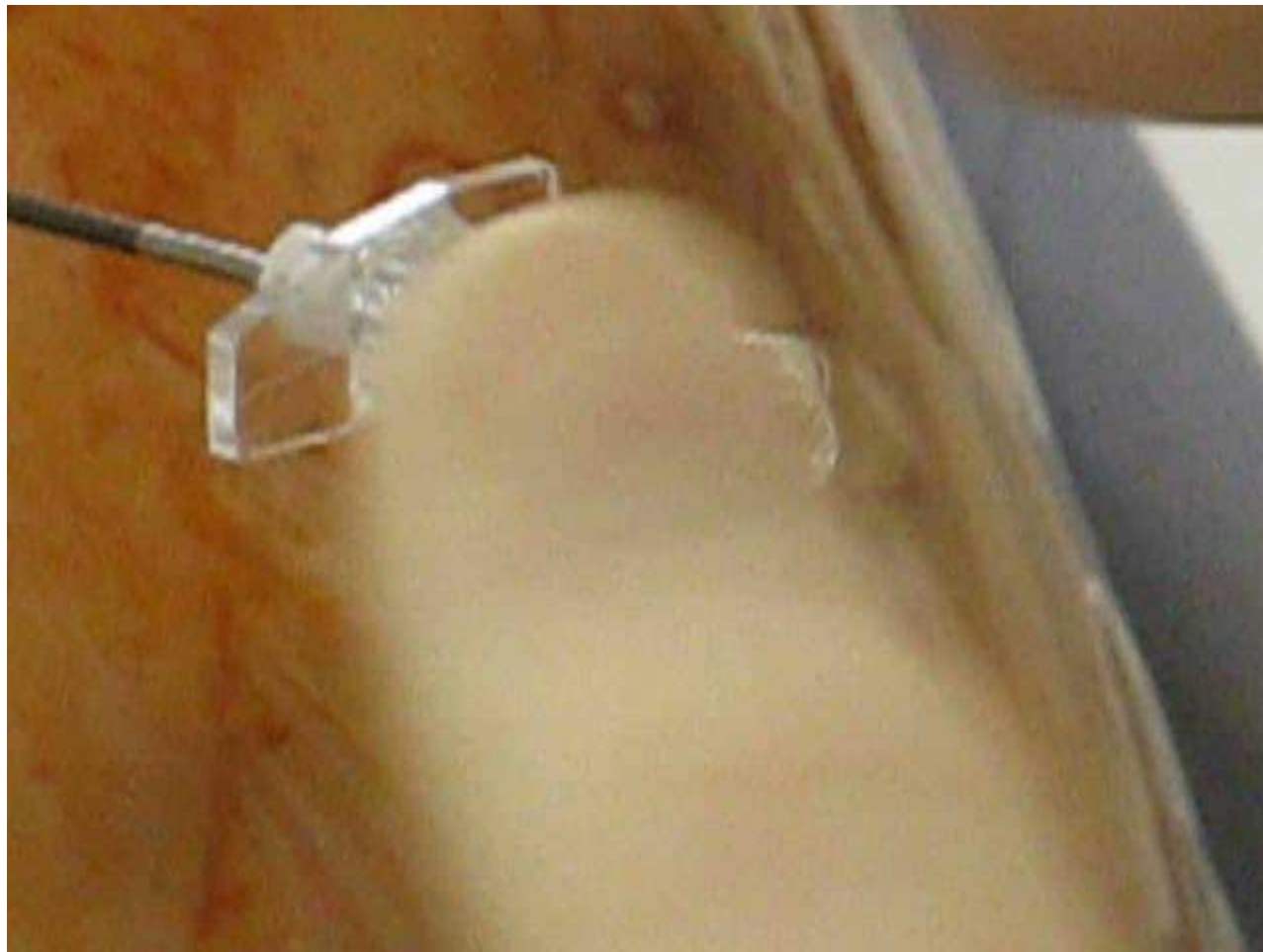


ANESTHESIE PERIDURALE

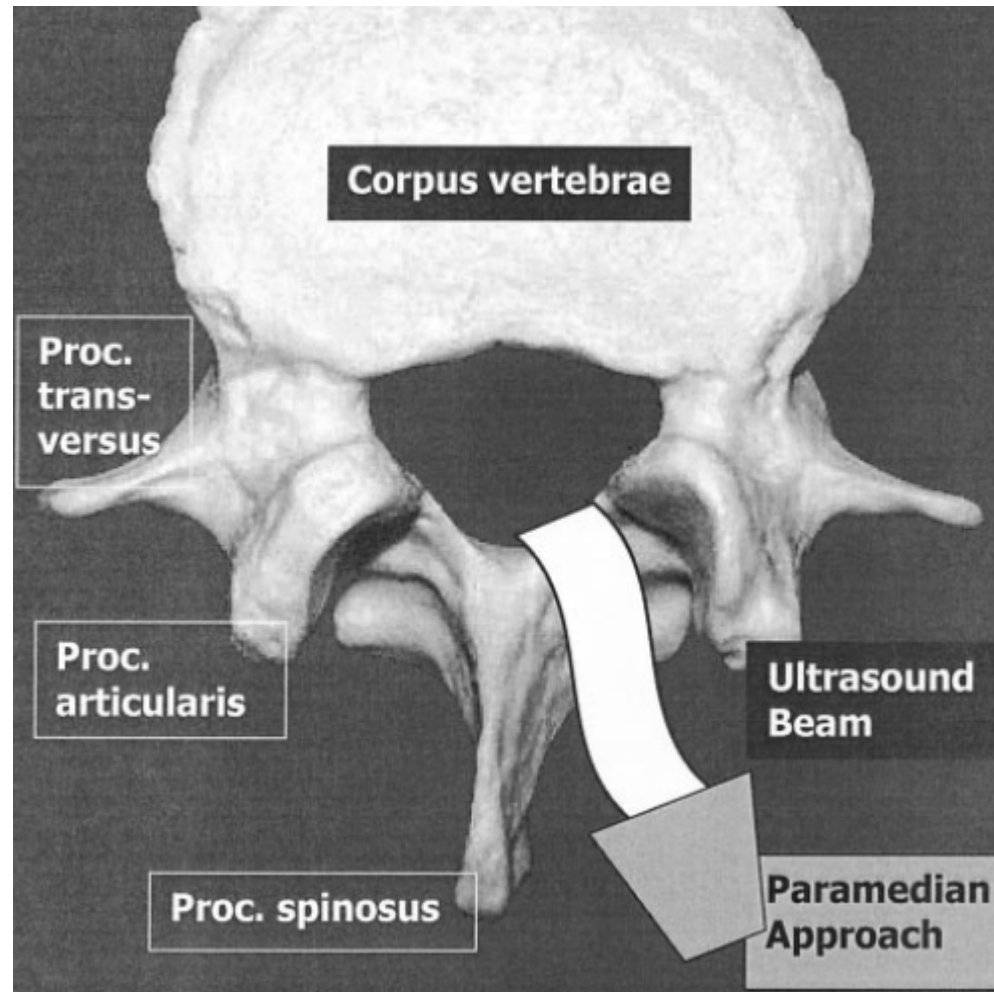
- ▶ Voie d'abord
 - ▶ Médiane ou paramédiane
- ▶ Reconnaissance de l'espace péridural
 - ▶ Perte de résistance
 - ▶ Goutte pendante
- ▶ Echo...
 - ▶ ...Repérage
 - ▶ ...Guidage



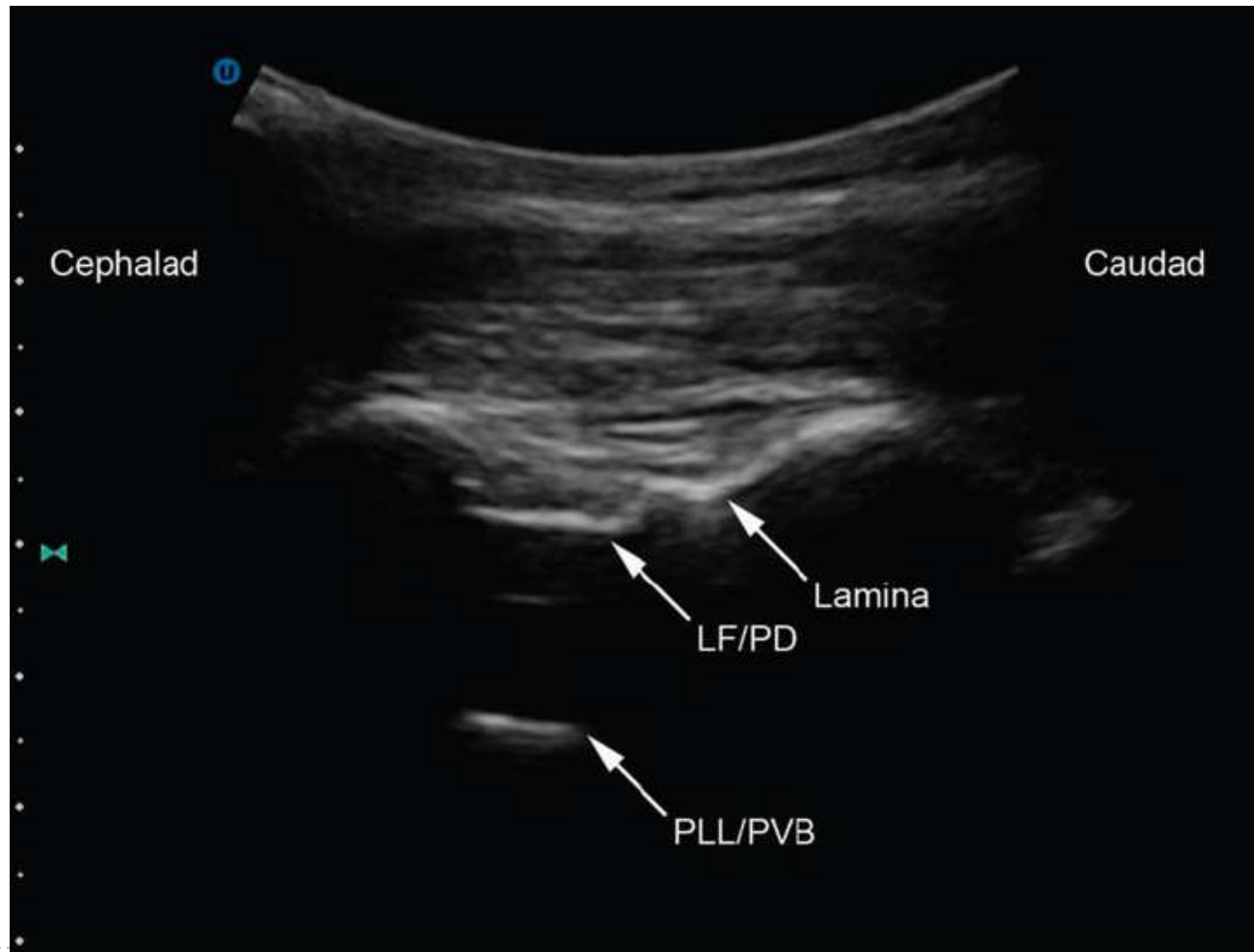
« Goutte pendante »



ECHOGUIDAGE



ECHOGUIDANCE

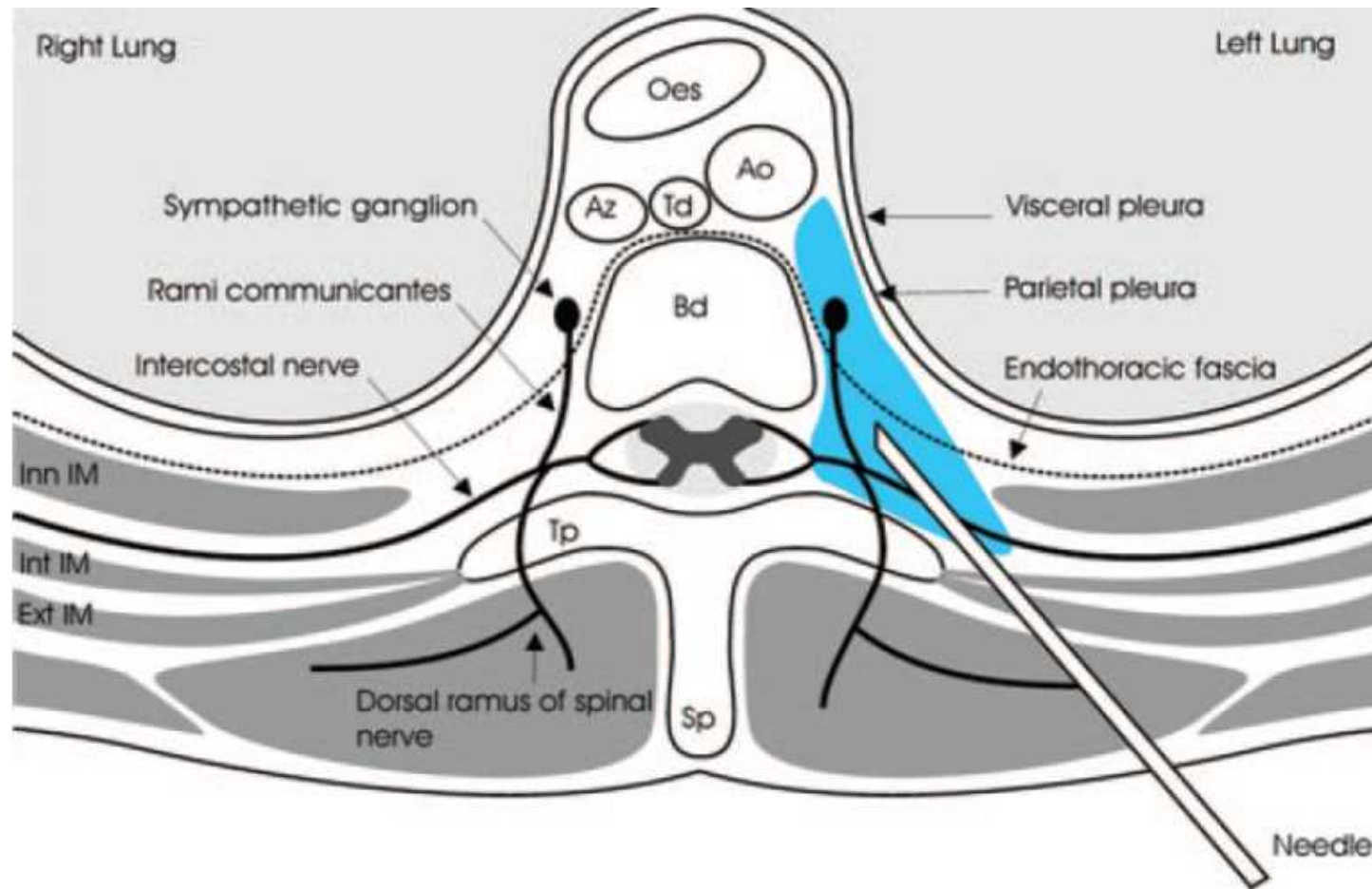


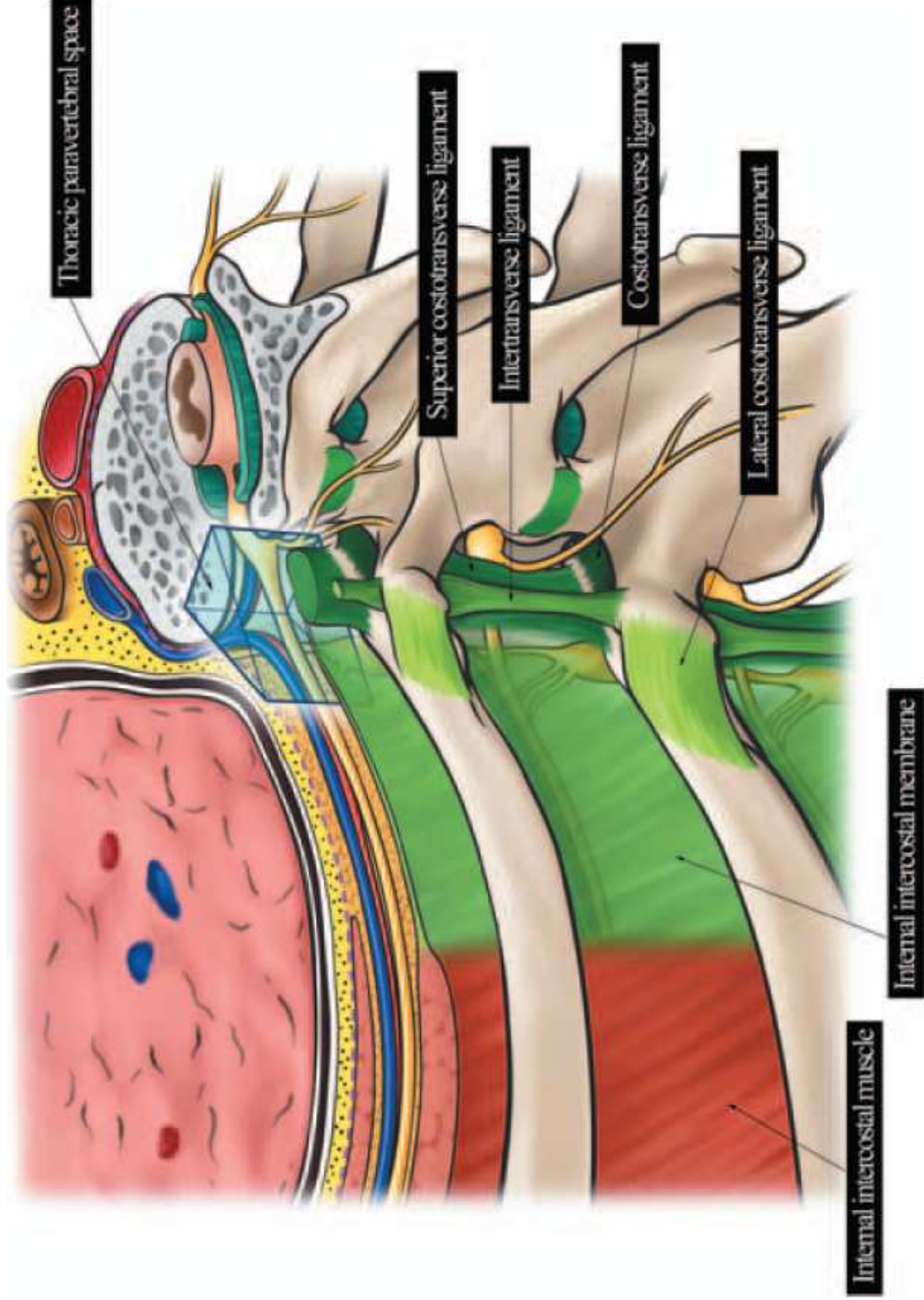
BLOC PARAVERTEBRAL

- ▶ Voie d'abord
 - ▶ Sagittale
 - ▶ Transverse
- ▶ Echoguidage +++
- ▶ Pose chirurgicale
 - ▶ Voie intra-thoracique
 - ▶ $\pm$ Intra-pleural
 - ▶ Voie percutanée

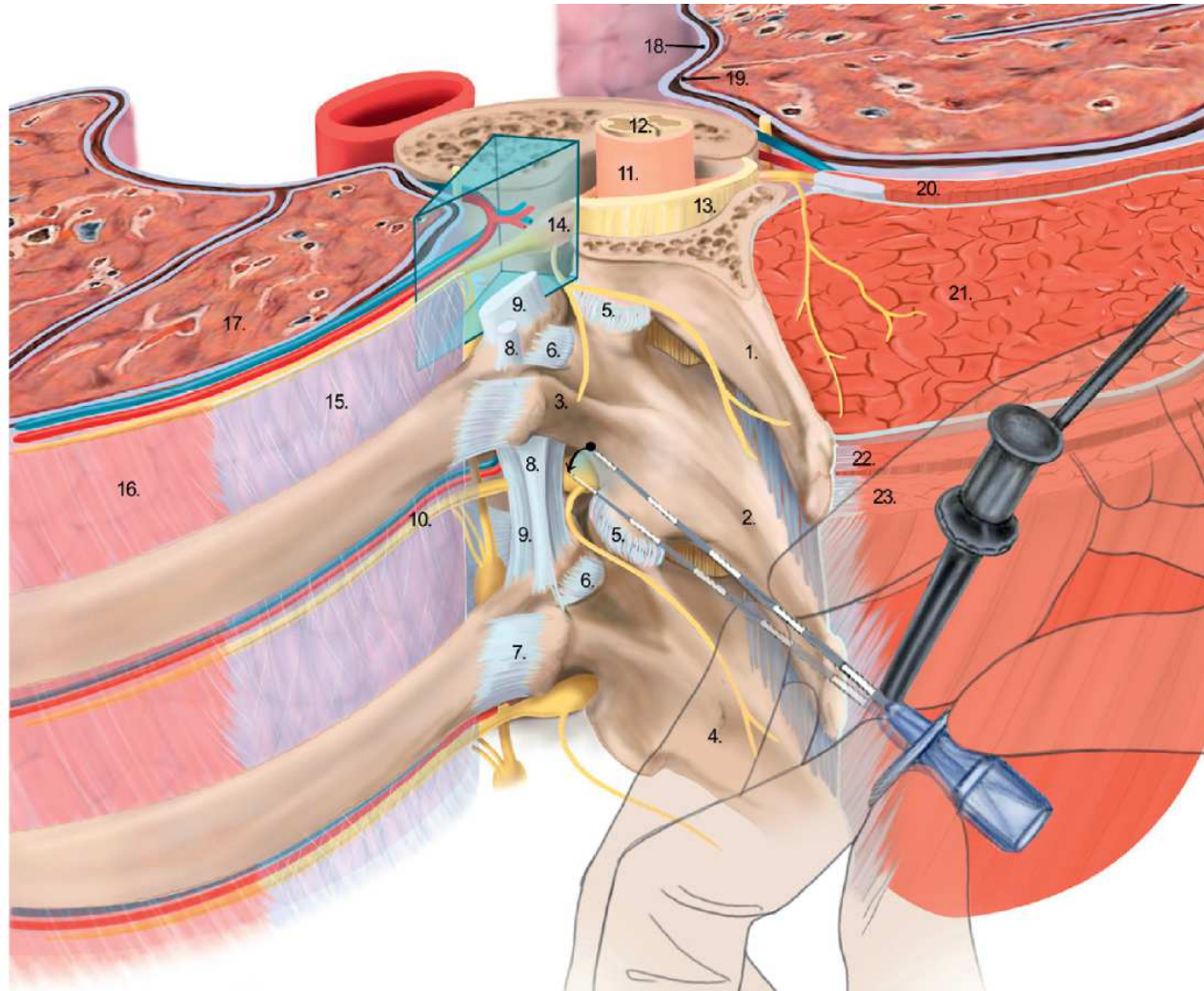


Anatomie

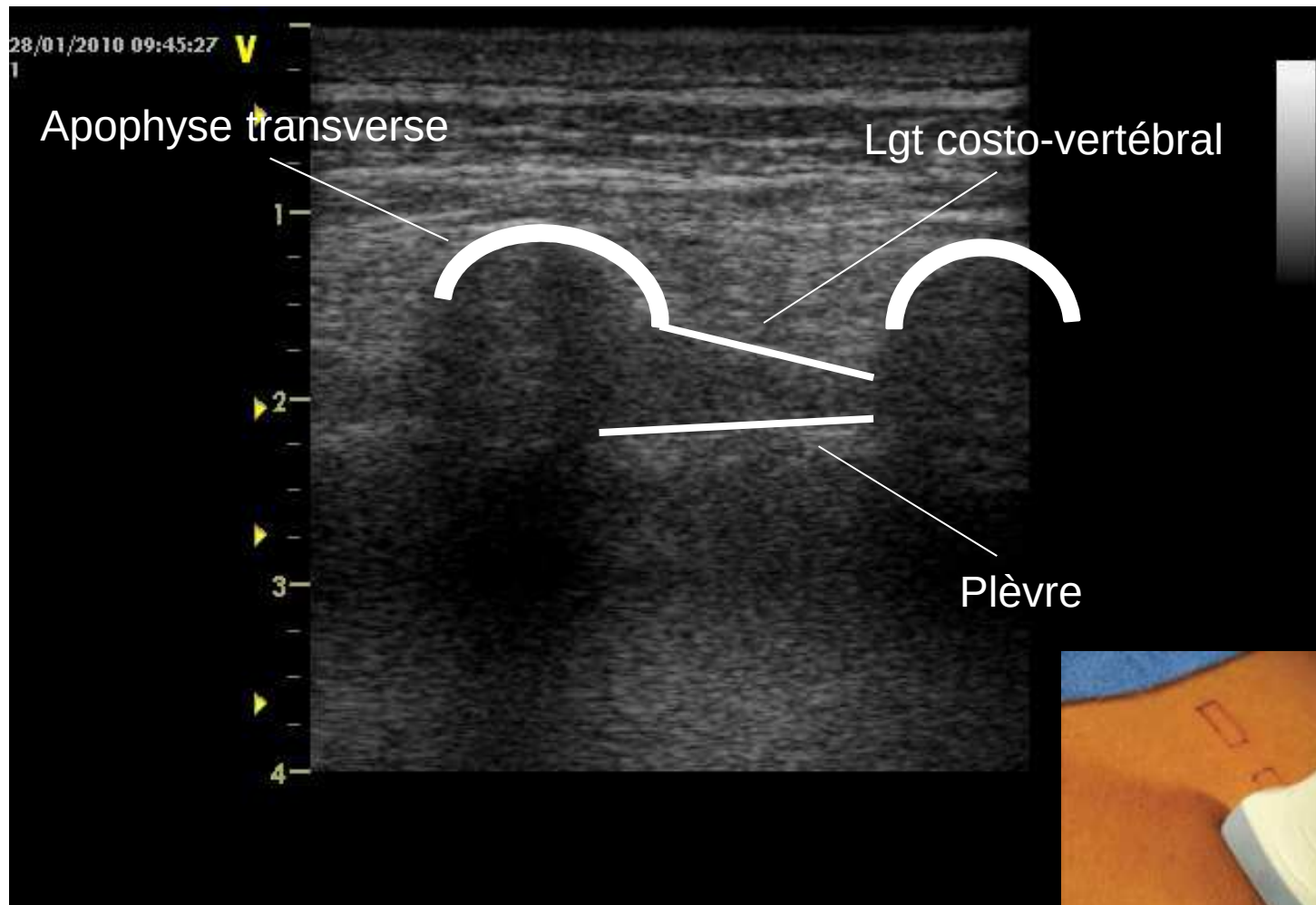




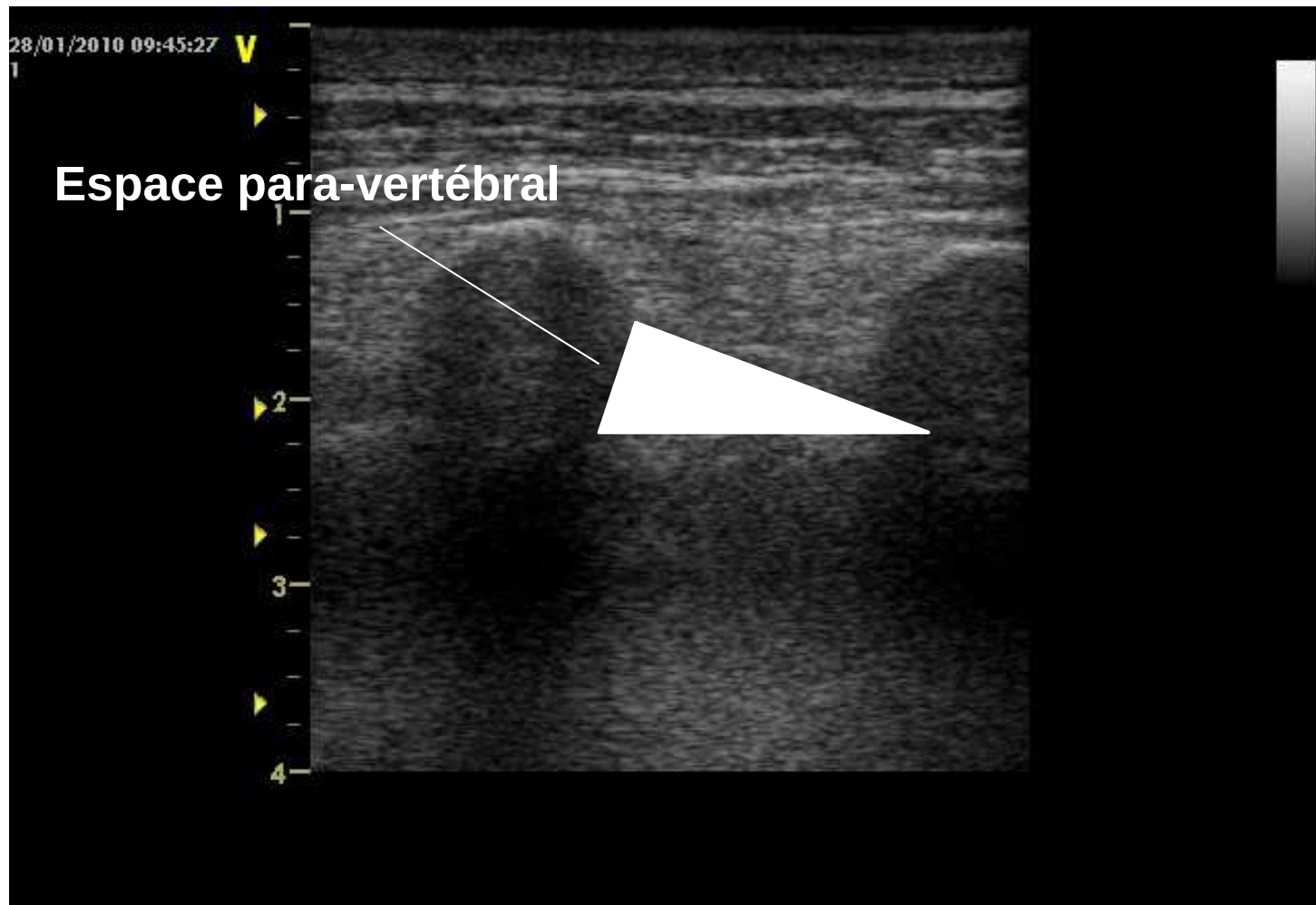
TECHNIQUE A L'AVEUGLE



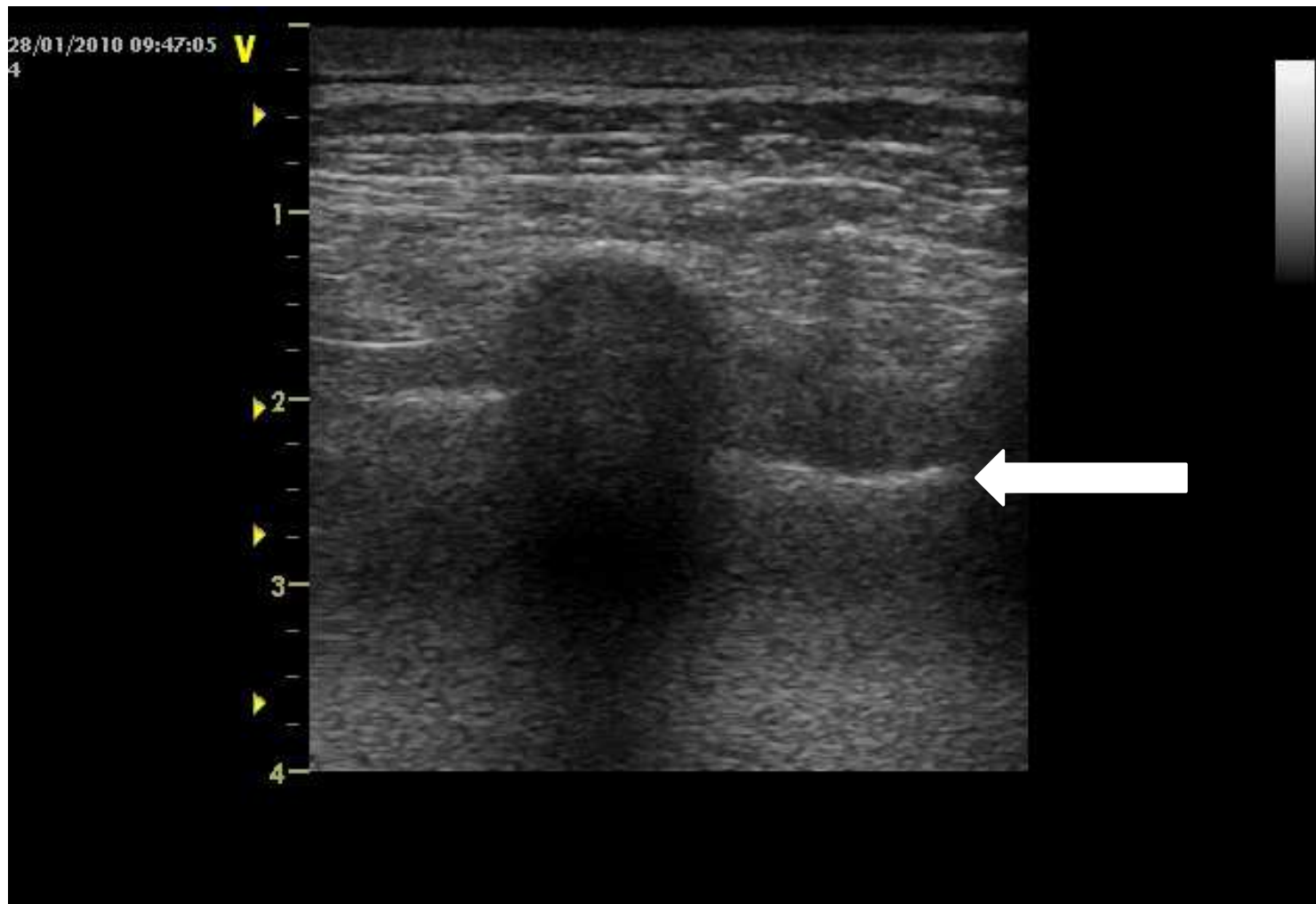
REPERES ECHOGRAPHIQUES



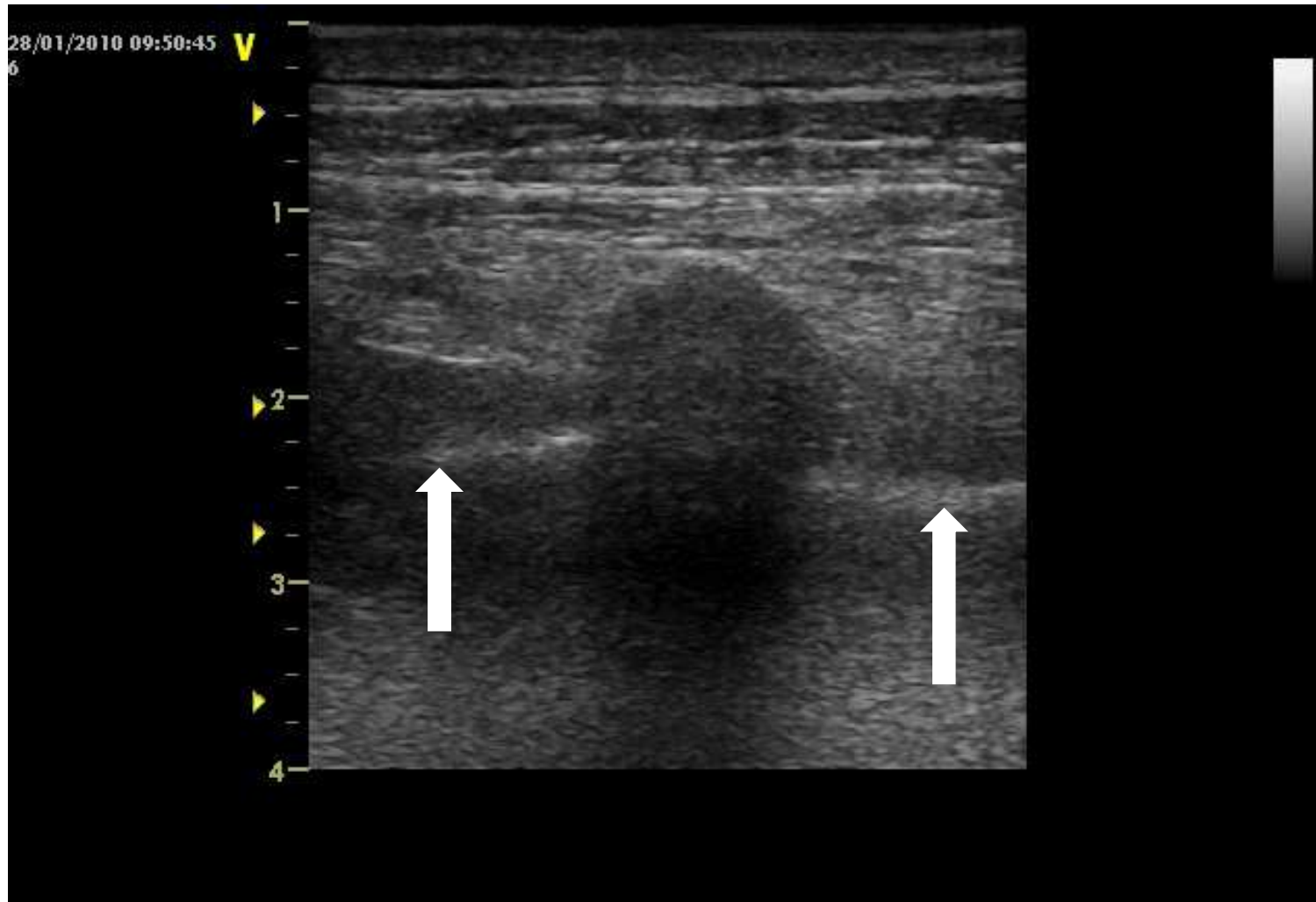
REPERES ECHOGRAPHIQUES



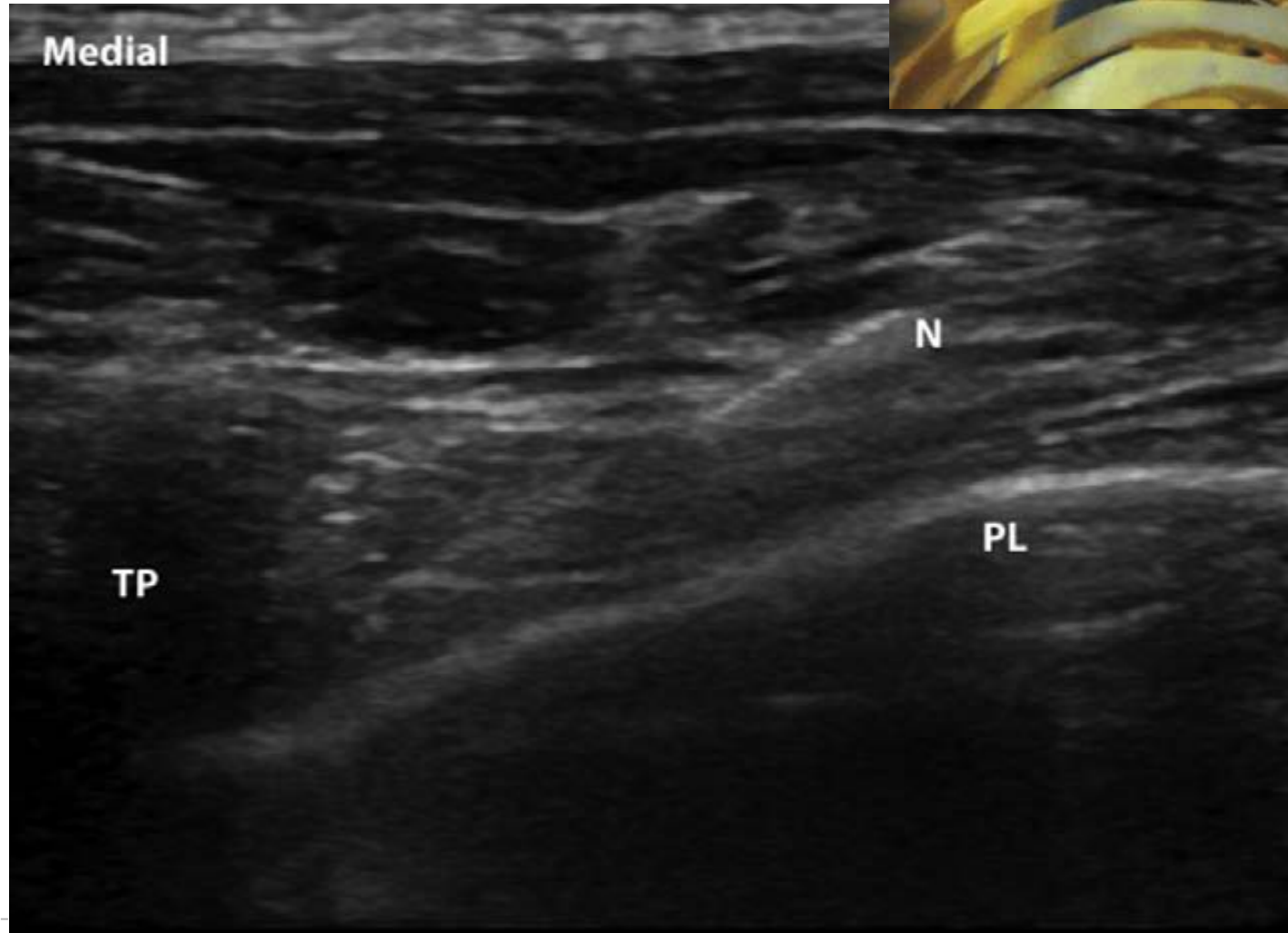
Recul de la plèvre



Diffusion à plusieurs espaces



VOIE TRANSVERSE





APD OU KTPV?

STRATEGIES

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. Davies¹, P. S. Myles^{1 2 3 *} and J. M. Graham⁴

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

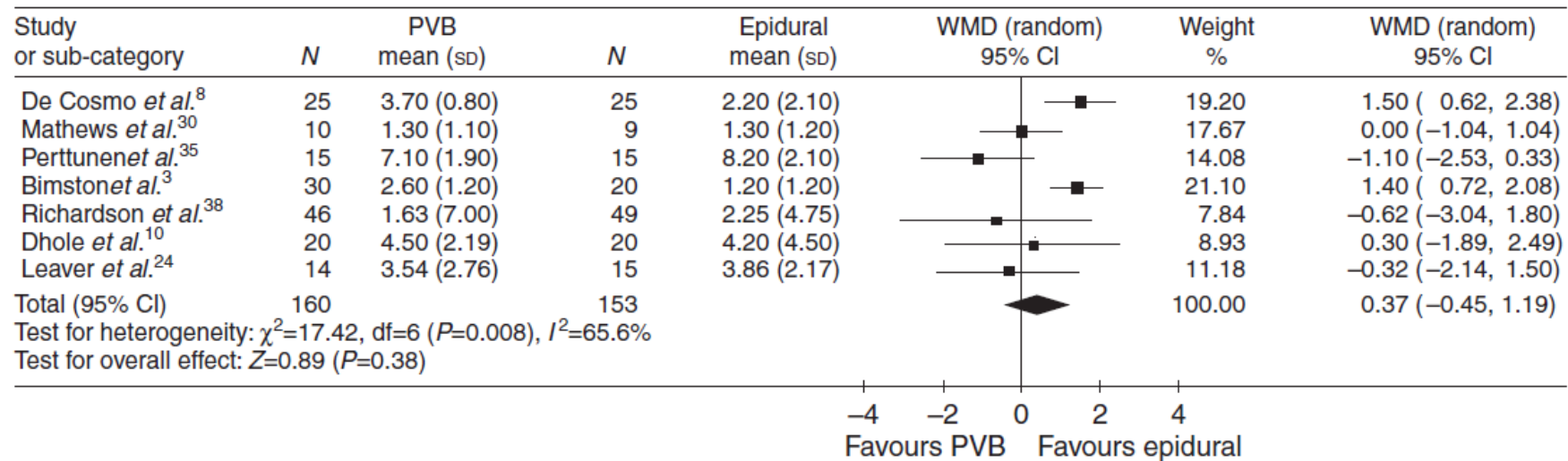
BJA



EFFICACITE IDENTIQUE?

At 4–6 h

Review: Paravertebral block
Comparison: 11 VAS 4–8 h
Outcome: 01 VAS at 4–8 h



EFFICACITE IDENTIQUE?

At 4–6 h

Review: Paravertebral block

Comparison: 11 VAS 4–8 h

Outcome: 01 VAS at 4–8 h

At 24 h

Review: Paravertebral block

Comparison: 02 VAS 24 h

Outcome: 01 VAS at 24 h

Study or sub-category	N	PVB mean (sd)	N	Epidural mean (sd)	WMD (random) 95% CI	Weight %	WMD (random) 95% CI
De Cosmo <i>et al.</i> ⁸	25	3.60 (1.00)	25	3.70 (2.50)		13.29	-0.10 (-1.16, 0.96)
Luketich <i>et al.</i> ²⁸	47	2.60 (1.50)	44	2.40 (1.50)		17.41	0.20 (-0.42, 0.82)
Mathews <i>et al.</i> ³⁰	7	0.60 (0.60)	9	1.20 (0.80)		16.77	-0.60 (-1.29, 0.09)
Perttunen <i>et al.</i> ³⁵	15	7.00 (1.60)	15	6.80 (2.00)		11.24	0.20 (-1.10, 1.50)
Kaiser <i>et al.</i> ¹⁷	13	4.00 (5.28)	13	4.25 (4.73)		2.45	-0.25 (-4.10, 3.60)
Bimston <i>et al.</i> ³	30	3.30 (1.90)	20	1.30 (1.90)		13.11	2.00 (0.92, 3.08)
Richardson <i>et al.</i> ³⁸	46	1.50 (1.50)	49	2.38 (2.06)		16.44	-0.88 (-1.60, -0.16)
Leaver <i>et al.</i> ²⁴	14	4.07 (1.82)	15	4.13 (2.45)		9.30	-0.06 (-1.62, 1.50)
Total (95% CI)	197		190			100.00	0.05 (-0.59, 0.69)

Test for heterogeneity: $\chi^2=22.29$, $df=6$ ($P=0.002$), $I^2=68.6\%$

Test for overall effect: $Z=0.15$ ($P=0.88$)

-4 -2 0 2 4
Favours PVB Favours epidural

EFFICACITE IDENTIQUE?

At 4–6 h

Review: Paravertebral block

Comparison: 11 VAS 4–8 h

Outcome: 01 VAS at 4–8 h

At 24 h

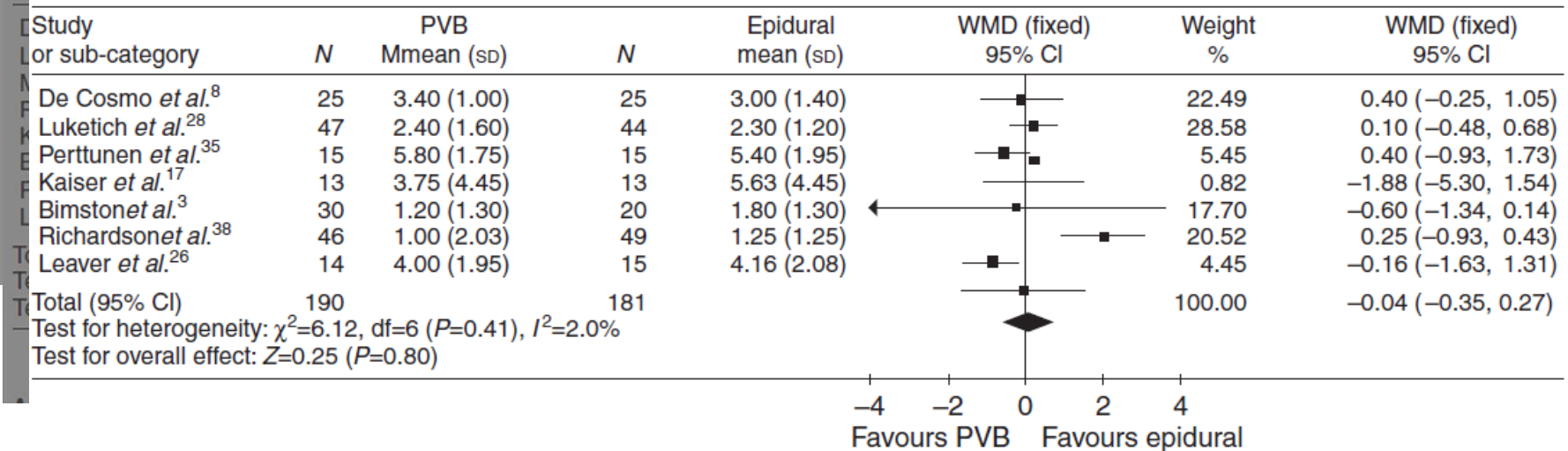
Review: Paravertebral block

At 48 h

Review: Paravertebral block

Comparison: 03 VAS 48 h

Outcome: 01 VAS at 48 h

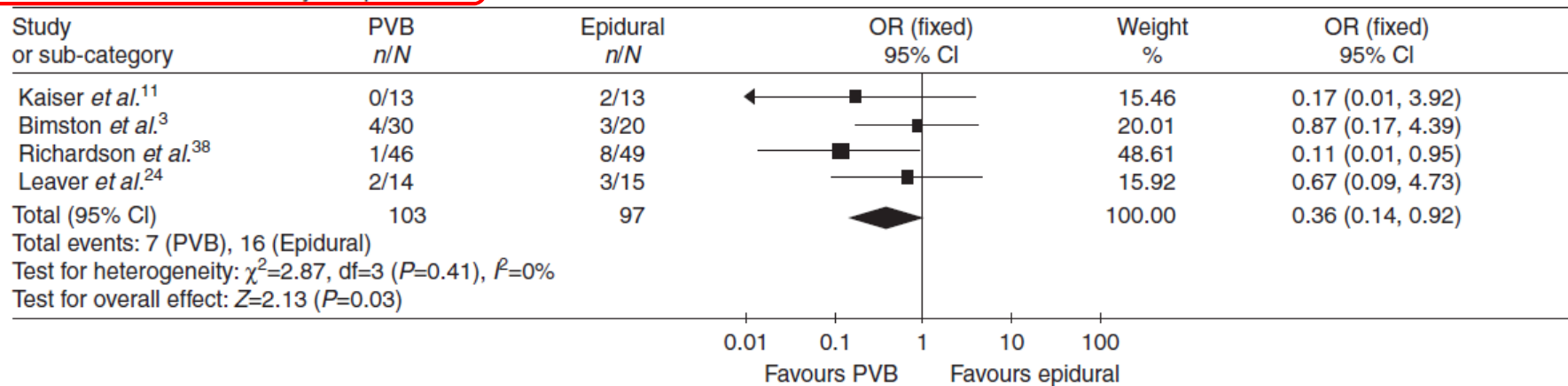


COMPLICATIONS post-opérateurs

Review: Paravertebral block

Comparison: 15 Pulmonary complications

Outcome: 01 Pulmonary complications



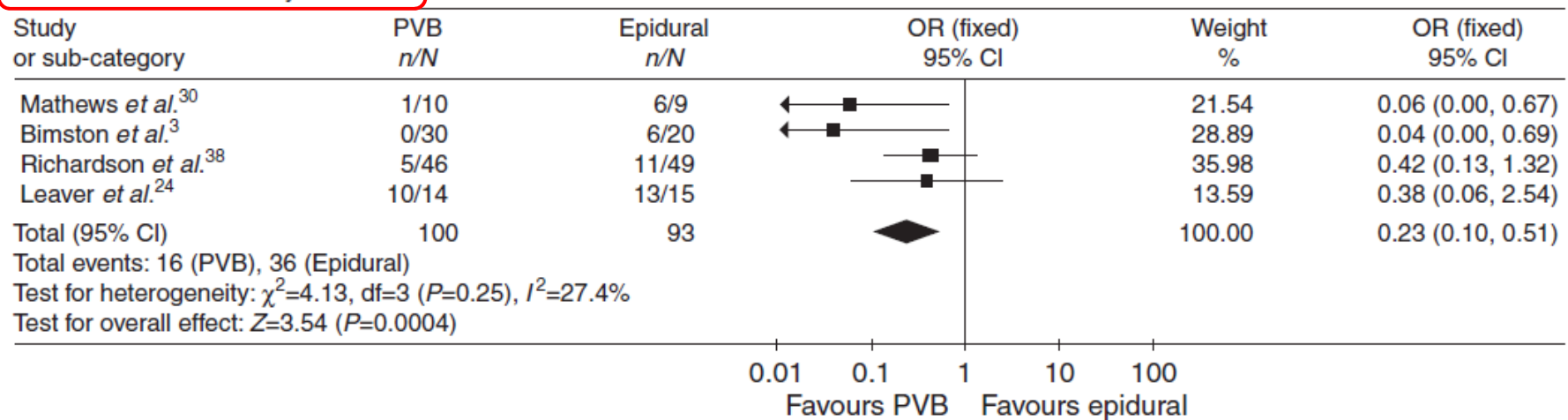
EFFETS SECONDAIRES

Urinary retention

Review: Paravertebral block

Comparison: 11 Urinary retention

Outcome: 01 Urinary retention



EFFETS SECONDAIRES

Urinary retention

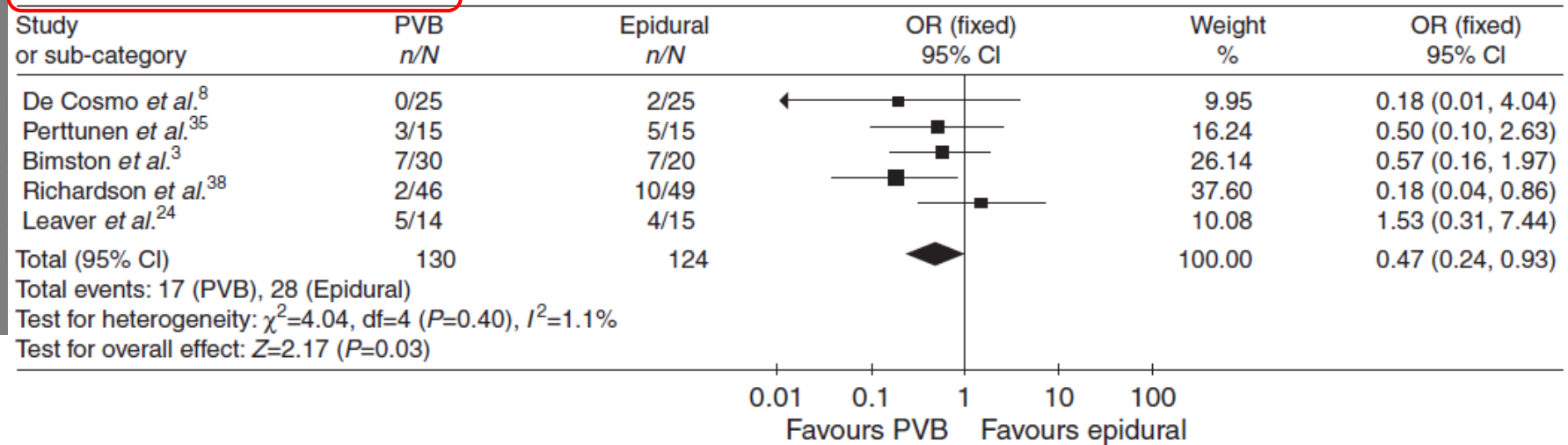
Review: Paravertebral block

Nausea and vomiting

Review: Paravertebral block

Comparison: 12 nausea or vomiting

Outcome: 01 nausea or vomiting



EFFETS SECONDAIRES

Urinary retention

Review: Paravertebral block

Nausea and vomiting

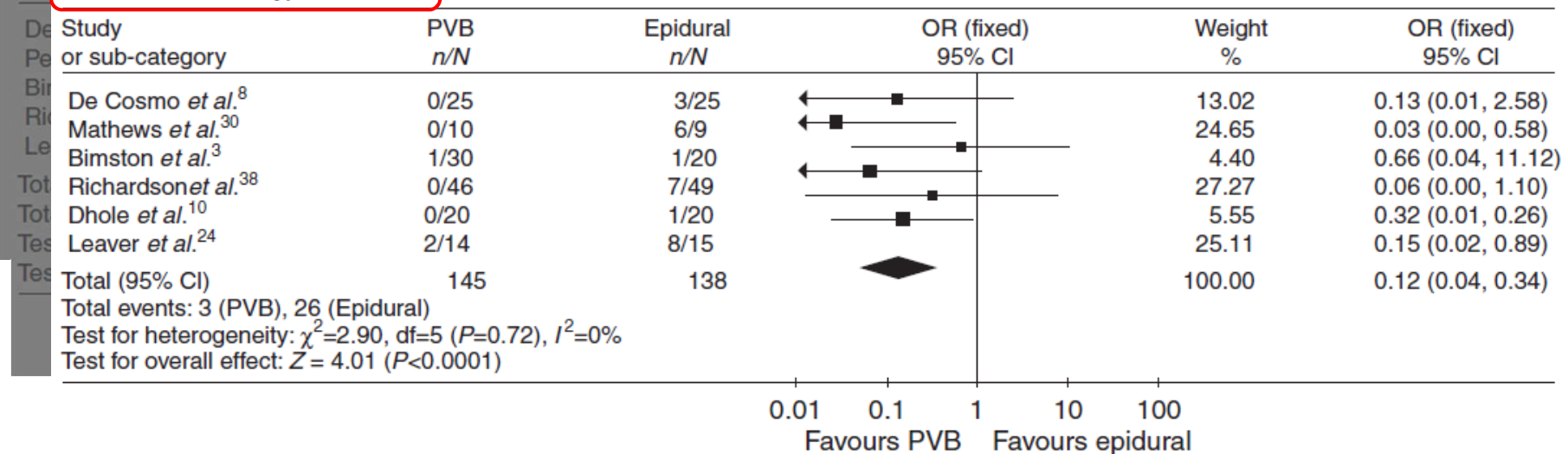
Review: Paravertebral block

Hypotension

Review: Paravertebral block

Comparison: 13 Hypotension

Outcome: 01 Hypotension



MAIS...

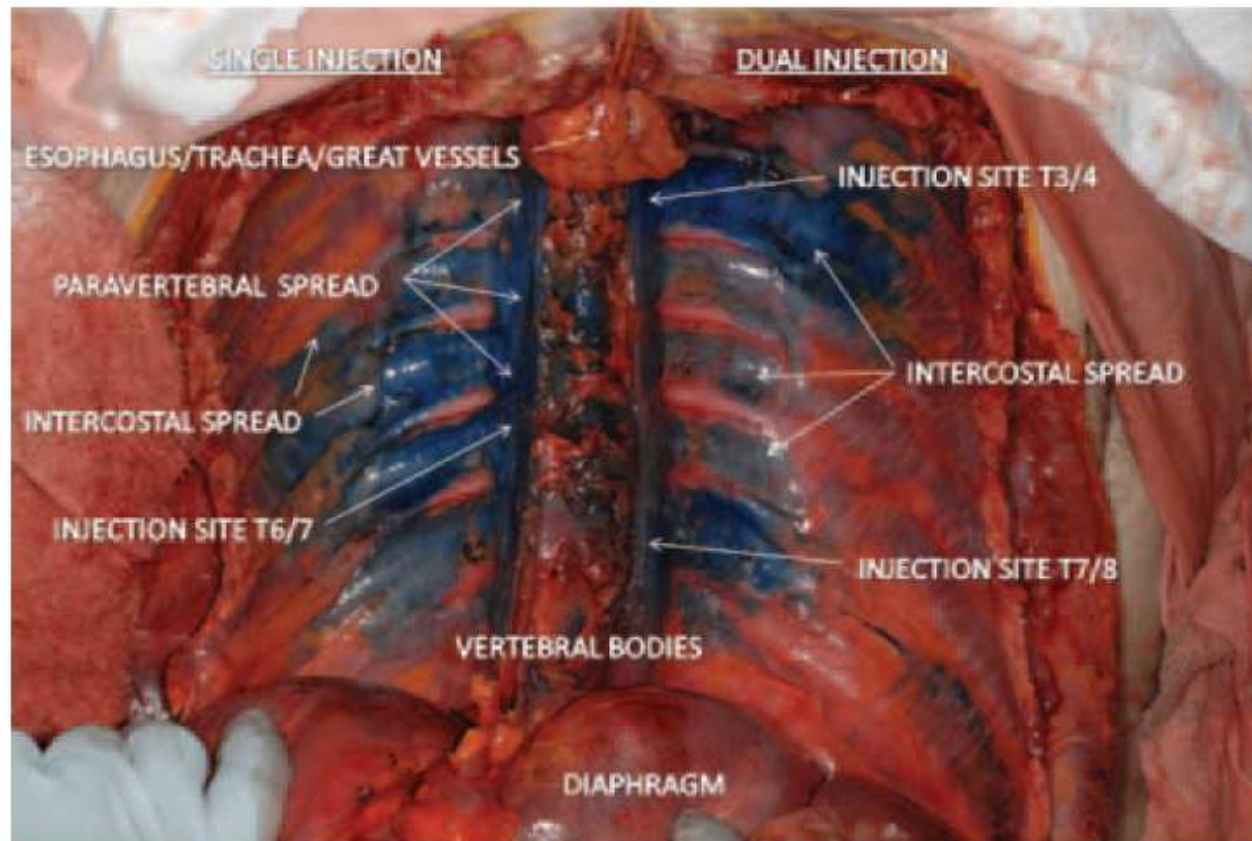


APD vs KTPV

- ▶ Résultats d'interprétation difficile:
 - ▶ Type de pose des KTPV
 - ▶ Type de chirurgie
 - ▶ Timing d'utilisation
 - ▶ Produits utilisés, concentration, débits, adjuvants, posologies...
 - ▶ Nombre d'études et de patients limités
 - ▶ Résultats contradictoires.
- ▶ Absence de données sur la douleur chronique



Une efficacité (im)prévisible ??



Ultrasound-Guided Thoracic Paravertebral Blockade: A Cadaveric Study

Brian Cowie, MBBS, FANZCA,* Desmond McGlade, MBBS, FANZCA,* Jason Ivanusic, PhD,†
and Michael J. Barrington, MBBS, FANZCA*

(Anesth Analg 2010;110:1735–9)



Ultrasound-guided thoracic paravertebral puncture and placement of catheters in human cadavers: where do catheters go?†

C. Luyet¹, G. Herrmann², S. Ross³, A. Vogt^{1*}, R. Greif¹, B. Moriggl⁴ and U. Eichenberger¹

British Journal of Anaesthesia **106** (2): 246–54 (2011)

	Needle-tip location (n=62)	
	LOR (n=26)	PUSG (n=36)
1. Paravertebral, near foramen	13 (50)	34 (94)
2. Paravertebral, intercostal	0	2 (6)
3. Paravertebral, vertebral	11 (43)	0
4. Prevertebral	0	0
5. Muscle	2 (8)	0
6. Epidural	0	0
7. Pleural	0	0
8. Insertion not possible	—	—

Ultrasound-guided thoracic paravertebral puncture and placement of catheters in human cadavers: where do catheters go?[†]

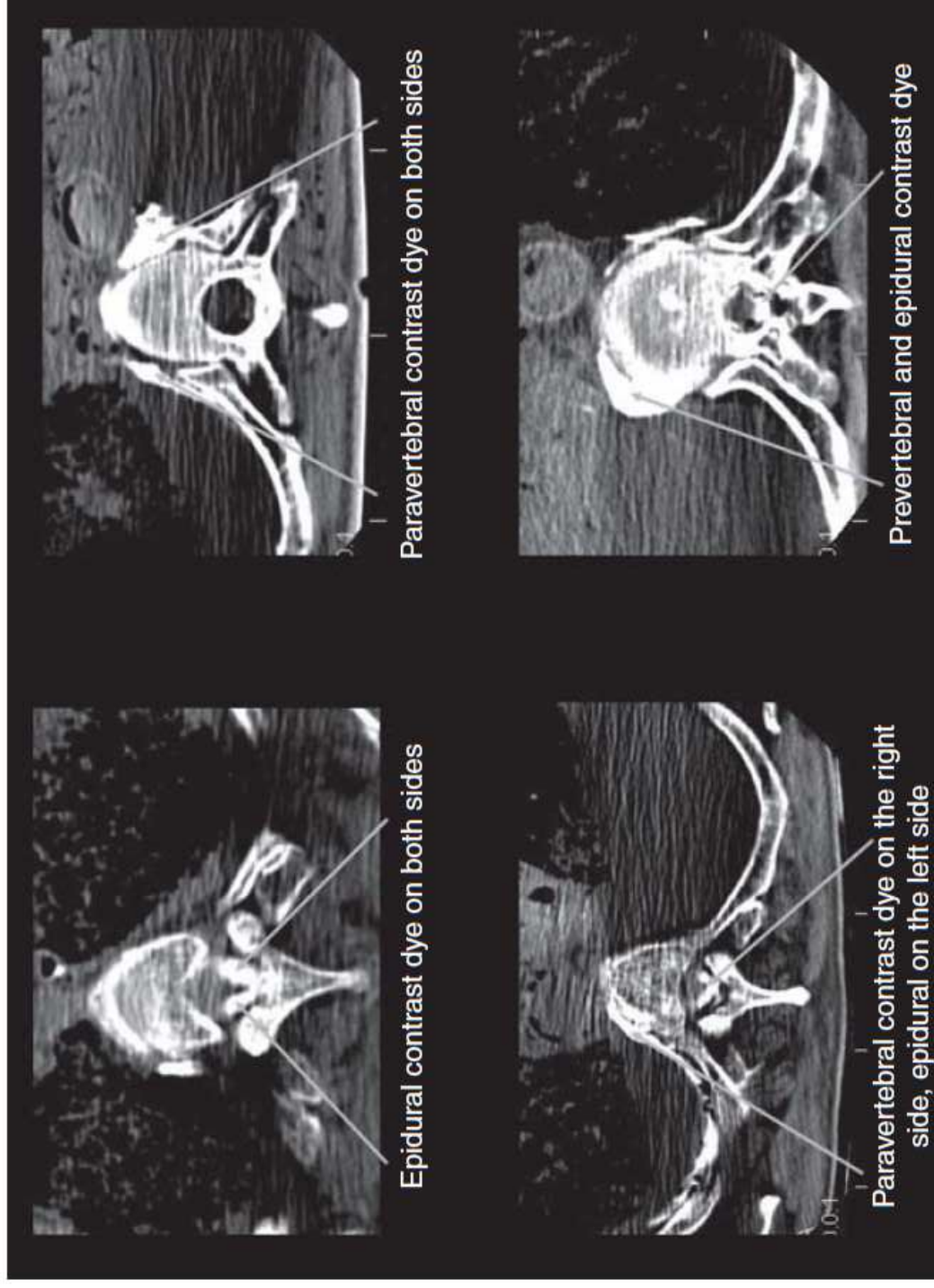
C. Luyet¹, G. Herrmann², S. Ross³, A. Vogt^{1*}, R. Greif¹, B. Moriggl⁴ and U. Eichenberger¹

	Catheter-tip location (n=62)	
	LOR (n=26)	PUSG (n=36)
1. Paravertebral, near foramen	3 (12)	5 (14)
2. Paravertebral, intercostal	2 (8)	2 (6)
3. Paravertebral, vertebral	15 (58)	17 (47)
4. Prevertebral	2 (8)	9 (25)
5. Muscle	3 (12)	1 (3)
6. Epidural	0	0
7. Pleural	0	1 (3)
8. Insertion not possible	1 (4)	1 (3)

Ultrasound-guided thoracic paravertebral puncture and placement of catheters in human cadavers: where do catheters go?†

C. Luyet¹, G. Herrmann², S. Ross³, A. Vogt^{1*}, R. Greif¹, B. Moriggl⁴ and U. Eichenberger¹





Ultrasound-guided paravertebral puncture and placement of catheters in human cadavers: an imaging study

C. Luyet¹, U. Eichenberger^{1*}, R. Greif¹, A. Vogt¹, Z. Szücs Farkas² and B. Moriggl³

British Journal of Anaesthesia 102 (4): 534–9 (2009)

doi:10.1093/bja/aep015 Advance Access publication February 24, 2009

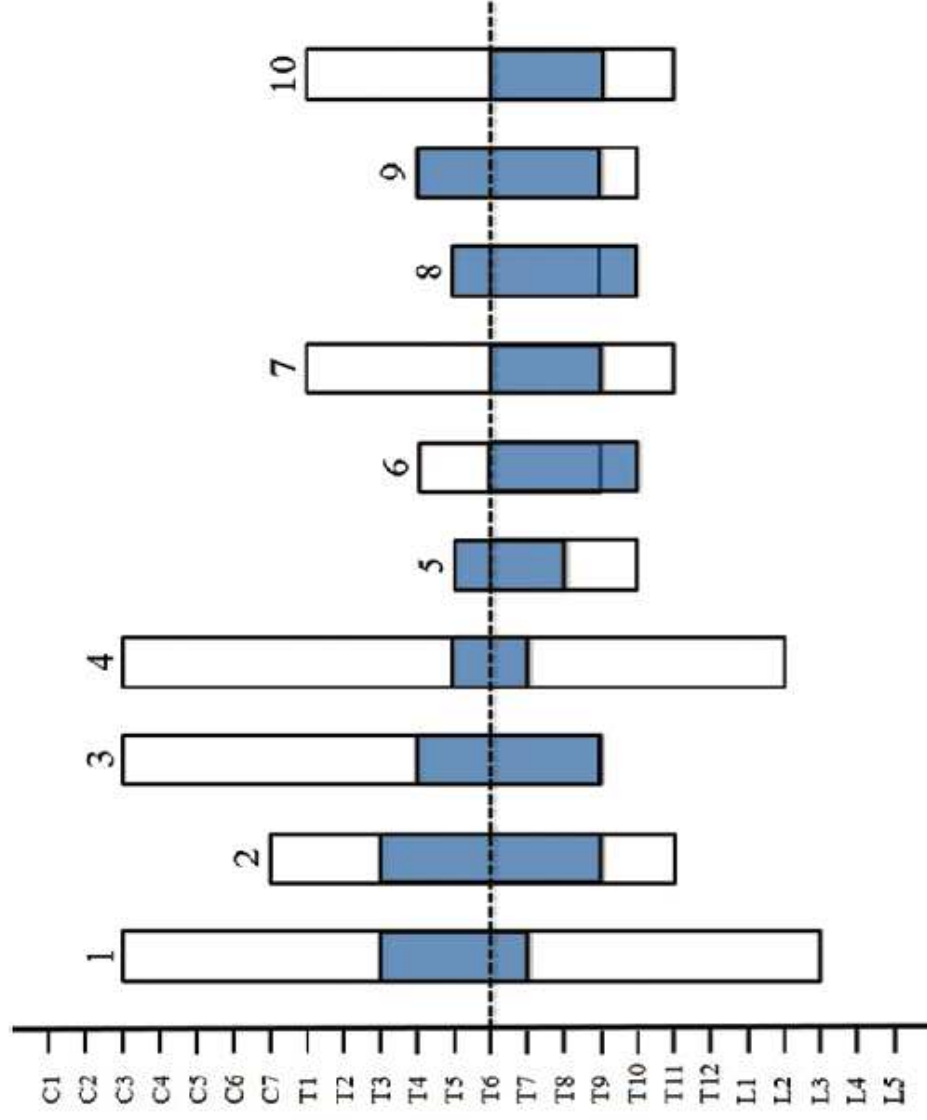


Fig. 3. Analysis of the spread of local anesthetic solution (full boxes) and sensory evaluation (open boxes) of left thoracic paravertebral blocks. Numbers indicate the consecutive

Magnetic Resonance Imaging Analysis of the Spread of Local Anesthetic Solution after Ultrasound-guided Lateral Thoracic Paravertebral Blockade



CONCLUSION

- ▶ Douleurs per et postopératoires majeures
- ▶ Efforts chirurgicaux de réduction de l'atteinte pariétale
- ▶ L' APD reste le gold standard
- ▶ Le BPV en alternative voire en première intention (Fastracking?)





MERCI...