Inter-fascial Plane Blocks

Of Pops and Clicks…



Dr Azrin Mohd Azidin
Department of Anaesthesia & Intensive Care
Hospital Kuala Lumpur, Malaysia

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Overview

- Background
- What options have we and what works?
  - Evidence of benefits?

    Transversus Abdominis Plane block (TAP)
    Quadratus Lumborum block (QL)
    PECS block
    Erector Spinae Plane block (ESP)

    …. what's current
- Issues with IFP blocks
- Conclusion

Interfascial Plane Blocks…

- First description of interfascial technique

  Fascia Iliaca Compartment Block (FICB) *Dalens 1989*

- What & How?

  block of a multi nerve anatomical section utilizing fascial coverings as a conduit facilitating and limiting spread of LA

- Precision and reproducibility improved with ultrasound
- Most extensively studied fascial plane block

  Transversus Abdominis Plane block (TAP) *Rafi 2001*

Evolution of *TAP block*…

TAP block- good evidence that posterior approach superior to lateral

Duration of analgesic effectiveness after the posterior and lateral transversus abdominis plane block techniques for transverse lower abdominal incisions: a meta–analysis

Abdallah FW, Laffey JG, Halpern SH, Brull R. *Br J Anaesth* 2013; **111:** 721–35.

J. Børglum, Denmark, B. Moriggl, Austria, J.G. McDonnell, Ireland, and T.F. Bendtsen, Denmark

…***"Posterior"*** TAP ***more effective*** than "Lateral" TAP… in terms of duration and reduction in opioid consumption…

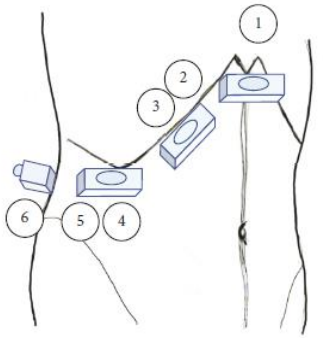
…***Carney*** described "Posterior" technique resulted in spread to PVB space… similar findings with Blanco –block…

Suggesting that
injection in the triangle of Petit may in fact
is a "Blanco-block" i.e a QL block

Review Article

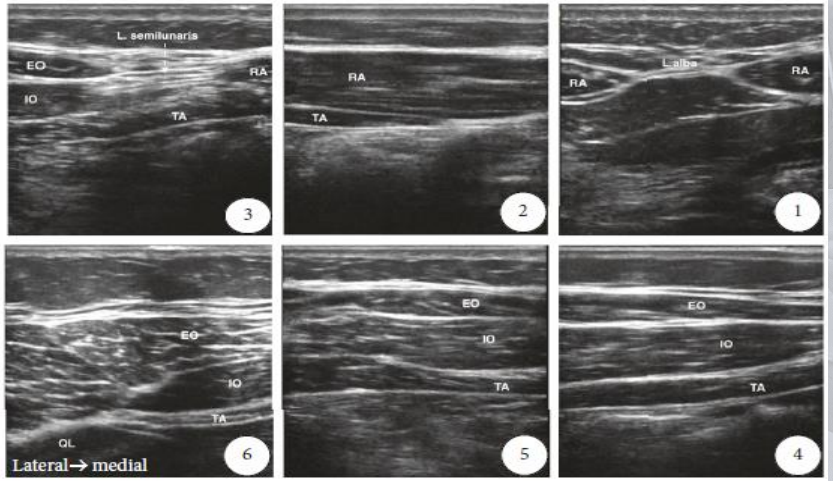
Transversus Abdominis Plane Block: An Updated Review of Anatomy and Techniques

Hsiao-Chien Tsai,[1] Takayuki Yoshida,[2] Tai-Yuan Chuang,[3,4] Sheng-Feng Yang,[5] Chuen-Chau Chang,[1,6,7] Han-Yun Yao,[5] Yu-Ting Tai,[5,7] Jui-An Lin,[5,7] and Kung-Yen Chen[5]



Approach	The main segmental thoracolumbar nerves [15]		Supplied area [15]
Subcostal [39–41]	T6-9	Anterior cutaneous branches	Upper abdomen just below the xiphoid and parallel to the costal margin
Lateral [10, 26]	T10-12	Anterior cutaneous branches	Anterior abdominal wall at the infraumbilical area, from midline to midclavicular line
Posterior [10, 42]	T9-12	Anterior cutaneous branches (possibly lateral cutaneous branches)	Anterior abdominal wall at the infraumbilical area and possibly lateral abdominal wall between costal margin and iliac crest
Oblique subcostal [11, 13, 15, 17, 43]	T6-L1	Anterior cutaneous branches	Upper and lower abdomen

TAP block Review… 2017



Regional Anesthesia

Section Editor: Terese T. Horlocker

The Analgesic Efficacy of Ultrasound-Guided Transversus Abdominis Plane Block in Adult Patients: A Meta-Analysis

(Anesth Analg 2015;121:1640–54)

Moira Baeriswyl, MD,* Kyle R. Kirkham, MD,† Christian Kern, MD,* and Eric Albrecht, MD*

BACKGROUND: Previous meta-analyses of the transversus abdominis plane (TAP) block have examined a maximum of 12 articles, including fewer than 650 participants, and have not examined the effect of ultrasound-guided techniques specifically. Recently, many trials that use ultrasound approaches to TAP block have been published, which report conflicting analgesic results. This meta-analysis aims to evaluate the analgesic efficacy of ultrasound-guided TAP blocks exclusively for all types of abdominal surgeries in adult patients.

METHODS: This meta-analysis was performed according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement guidelines. The primary outcome was cumulative IV morphine consumption at 6 hours postoperatively, analyzed according to the type of surgery, the type of surgical anesthesia, the timing of injection, the block approach adopted, and the presence of postoperative multimodal analgesia. Secondary outcomes included IV morphine consumption at 24 hours postoperatively; pain scores at rest and on movement at 6 and 24 hours postoperatively; and postoperative nausea and vomiting, pruritus, and rates of complications.

RESULTS: Thirty-one controlled trials including 1611 adult participants were identified. Independent of the type of surgery (abdominal laparotomy, abdominal laparoscopy, and cesarean delivery) but not independent of the type of surgical anesthesia (general anesthesia, spinal anesthesia with or without intrathecal long-acting opioid), ultrasound-guided TAP block reduced IV morphine consumption at 6 hours postoperatively by a mean difference of 6 mg (95% confidence interval [CI], −7 to −4 mg; $I^2 = 94\%$; $P < 0.00001$). The magnitude of the reduction in morphine consumption at 6 hours postoperatively was not influenced by the timing of injection ($I^2 = 0\%$; $P = 0.72$), the block approach adopted ($I^2 = 0\%$; $P = 0.72$), or the presence of postoperative multimodal analgesia ($I^2 = 73\%$; $P = 0.05$). This difference persisted at 24 hours postoperatively (mean difference, −11 mg; 95% CI, −14 to −8 mg; $I^2 = 99\%$; $P < 0.00001$). Pain scores at rest and on movement were reduced at 6 hours postoperatively (mean difference at rest, −10; 95% CI, −15 to −5; $I^2 = 92\%$; $P = 0.0002$; mean difference on movement, −9; 95% CI, −14 to −5; $I^2 = 58\%$; $P < 0.00001$). There were neither differences in the incidence of postoperative nausea and vomiting ($I^2 = 1\%$; $P = 0.59$) nor in the pruritus ($I^2 = 12\%$; $P = 0.58$) Two minor complications (1 bruise and 1 anaphylactoid reaction) were reported in 1028 patients.

CONCLUSIONS: Ultrasound-guided TAP block provides marginal postoperative analgesic efficacy after abdominal laparotomy or laparoscopy and cesarean delivery. However, it does not provide additional analgesic effect in patients who also received spinal anesthesia containing a long-acting opioid. The minimal analgesic efficacy is independent of the timing of injection, the approach adopted, or the presence of postoperative multimodal analgesia. Because of heterogeneity of the results, these findings should be interpreted with caution. (Anesth Analg 2015;121:1640–54)

RCTs (4 languages);

USG SS TAP with/without GA or SAB V "non-active comparator";

ANY abdominal surgery;

up to June 2013;

Outcome:

*cumulative IV morphine @ 6h

*static & dynamic pain scores @ 6h,24h

cumulative morphine @ 24h

time to 1st request

PONV, sedation, satisfaction scores

time to discharge

rates of block complications

31 RCTs (n=1611)

Majority ***low risk of bias***

GA (25); SAB+ (3); SAB- (3)

Pre-op- 18; post-op-13

Subcostal-2; Lateral-18; Posterior-8; unknown-3

Primary Outcome:

IV Morphine @ 6h reduced by 6mg (-7 to -4; p < 0.00001)

Magnitude of reduction persisted *in laparotomy: p< 0.00001*

Laparoscopy; p- 0.0004

Caesarean delivery; p- 0.04

Not influenced by *timing of injection ; p-0.72*

Approach; p-0.72

Presence or absence of multimodal analgesia; p-0.05

Morphine reduction seen in GA (p < 0.00001)

In SAB – long opioid ((p < 0.0001)

NOT in SAB + long opioid (p-0.05)

MODERATE quality of evidence

For Secondary Outcomes…

Statistically Significant

IV Morphine reduction @ 24h
Mean resting pain Scores @ 6h
Mean dynamic pain Scores @ 6h

"…marginal clinical benefit…."

***No statistically significant difference in other** secondary outcome parameters (PONV; Time to first analgesia request; pruritus; sedation; satisfaction)*

19 RCTs (n=1028)
2 reported complications
1 anaphylactoid reaction
2 bruising

J Anesth
DOI 10.1007/s00540-017-2323-5

REVIEW ARTICLE

Clinical safety and effectiveness of transversus abdominis plane (TAP) block in post-operative analgesia: a systematic review and meta-analysis

Ning Ma[1] · Joanna K. Duncan[1] · Anje J. Scarfe[1] · Susanne Schuhmann[2] · Alun L. Cameron[1]

56 RCTs (n= 3428)

Comparing ***'effectiveness'*** and ***'safety'*** of TAP

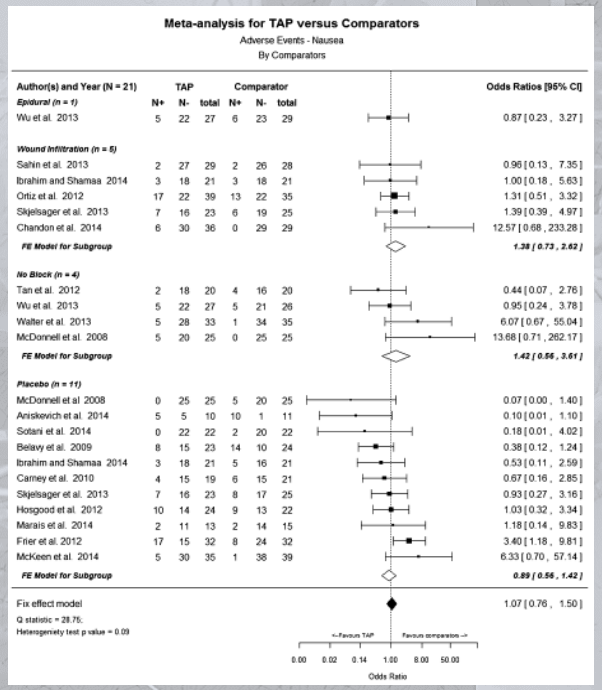
Limited to ***English*** language

No limits on LA type/dose or comparators

Outcome:

Safety: PONV
Itch
Drowsiness
Intra-op complications

Effectiveness : morphine use
time to first analgesia
pain



Nausea

21 RCTs

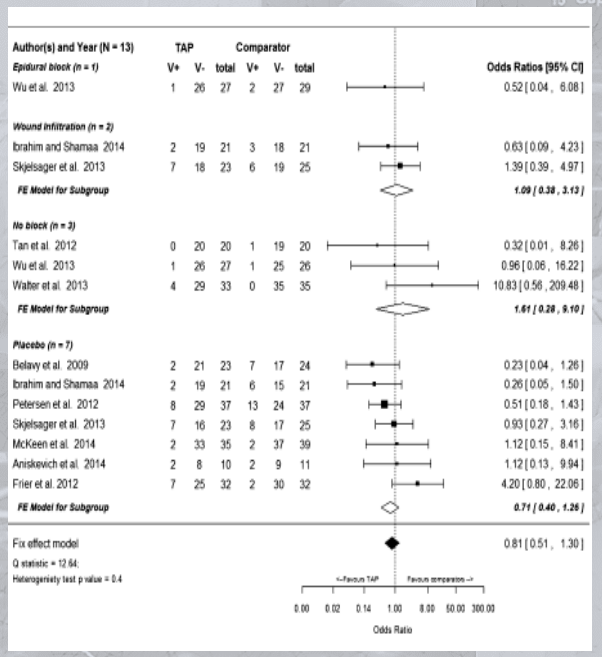
No SS reduction in incidence

v placebo
0.89 (0.56-1.42) p-0.09

v No block
1.42 (0.56-3.61)

v WI
1.38 (0.73-2.62)

Overall
1.07 (0.73-262) p-0.09



Vomiting

13 RCTs

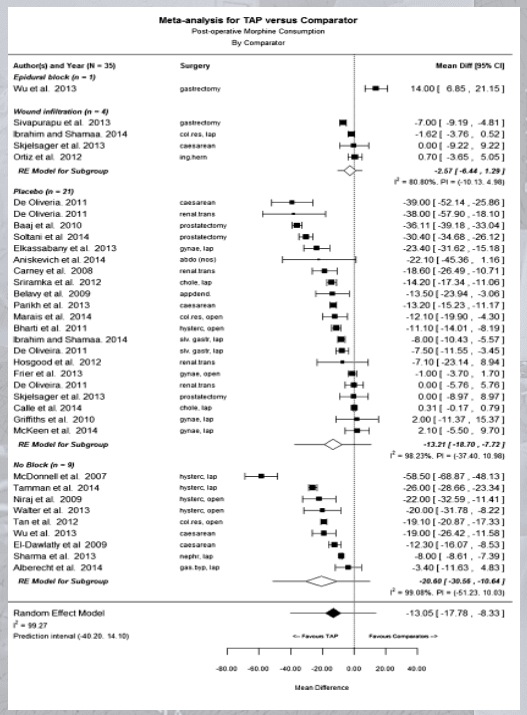
No SS reduction in incidence

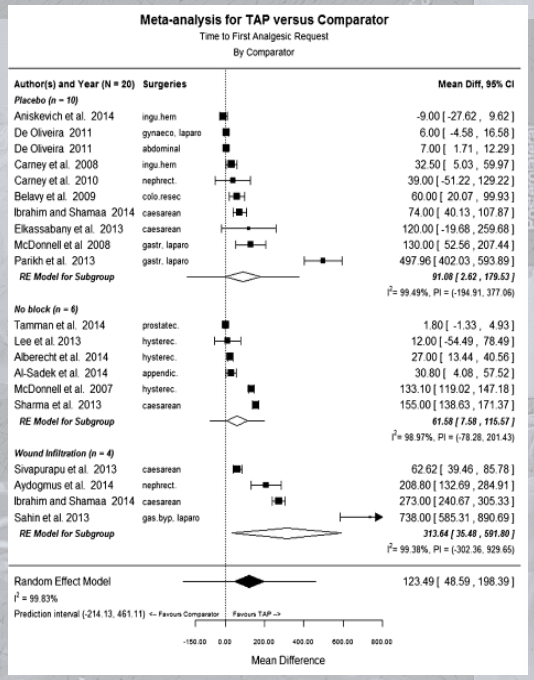
v placebo
0.71 (0.4-1.26) p-0.21

v standard care
1.61 (0.28-9.10)

v WI
1.09 (0.38-3.13)

Overall
0.81 (0.51-1.30) p-0.4





Post-op morphine consumption @ 24h

35 RCTs

v all comparator types

Overall SS reduction

13.05 mg (8.33-17.78) p ≤ 0.05

TAP v no block

20.60 (10.64 – 30.56); p ≤ 0.05

TAP v placebo

13.21 (7.72-18.70) ; p ≤ 0.05

No SS difference v WI

2.57 (-1.29 to 6.44); p = 0.19

High heterogeneity

Time to First Analgesic request

20 RCTs

Overall SS increased time by

123.49 m (48.59 – 198.39)

TAP v No block

61.58 (7.58 – 115.57); p ≤ 0.05

TAP v placebo

91.08 (2.62 – 179.53); p ≤ 0.05

TAP v WI

313.64 (35.48 – 591.80); p ≤ 0.05

High heterogeneity

Pain-related Outcomes

No meta-analysis could be performed due to inconsistent and subjective measures

4-8h – Early pain (41 RCTs)

Late Pain (≥ 24h)

NONE showed
TAP to have poorer performance
for early or late pain.

Conclusion

.. ***TAP block*** to be ***a safe procedure*** compared to both standard postoperative care and other analgesic techniques such as wound infiltration and epidural block..

... is ***associated with reducing consumption*** and ***delaying the requirement*** for opioids

TAP ***provides equivalent or improved patient outcomes*** compared to other analgesia techniques

From Previous Meta-analyses…

24h Morphine consumption:

10 RCTs *in Laparoscopic surgeries:* ***De Oliveira*** *2014* ***… 5.7 mg***

12 RCTs *in lower abdominal incisions:* ***Abdallah*** *2013* ***… 9.1 mg***

22 RCTs (from 31): ***Baeriswyl*** *2015*

-USG TAP
-no active comparators
-all types of surgeries ***… 11 mg***

35 RCTs (from 56): ***Ning Ma*** *2017*

-active comparators
-all types of surgeries ***… 13.05 mg***

From Previous Meta-analyses…

Time to First analgesic request

Baeriswyl 2015

2 RCTs; 60 each (v placebo)
248 min (-238 to 734); ***p = 0.34***

Ning Ma 2017

20 RCTs;
Overall 123.49 min (48.59 – 198.39)

No block; 61.58 (7.58 – 115.57)
Placebo; 91.08 (2.62 – 179.53)
WI; 313.64 (35.48 – 591.80)

Block related complications:

Baeriswyl 2015;

19 RCTs (n=1028)
2 reported; anaphylactoid bruising

Ning Ma 2017;

42 RCTs: NO reported complications
13 RCTs did not report

From Previous Meta-analyses…

Pain – related outcome:

Baeriswyl 2015:

Resting pain scores @ 6h : 24 RCTs -9.7 (-14.8 to -4.6): p- 0.0002
Dynamic pain scores @ 6h: 26 RCTs -9.4 (-13.5 to -5.4): p < 0.00001

Resting pain scores @ 24h : 26 RCTs *-4.3 (-8.8 to 0.02): p- 0.05*
Dynamic pain scores @ 24h: 20 RCTs *-5.9 (-12.3 to 0.4): p- 0.07*

Ning Ma 2017: (41 RCTs)

Pain scores not defined….
Early : 4-8h
Late: >24h

No meta-analysis done (ranges in measures reported)

Conclusion TAP

Moderate quality level of evidence

… ***Safe*** procedure…

…***Statistically significant reduction*** in early peri-operative and for Types of Surgery, Anaesthesia, block timing, approach , ± multi-modal AND @ ***24h morphine consumption*** … although ***may only clinically be marginal***….

None showed poorer performance than active comparator for ***pain scores*** and ***times to first analgesic request***…