MODERN BLOG

WHAT'S NEW

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PECS
Quadratus Lumborum
PECS Blocks
- PECS I
- PECS II
- Serratus Plane or PECS III

QLB
- PECS Blocks
  - PECS I
  - PECS II
  - Serratus Plane or PECS III
Blanco (2011) described a novel approach – the ‘pecs block’ – single interfascial plane injection between Pectoralis major and minor muscles. This technique is particularly useful for reconstructive breast cancer surgery or insertion of subpectoral prostheses.
PECS BLOCK – BLOCK OF THE PECTORAL NERVES

The ‘pecs block’: a novel technique for providing analgesia after breast surgery

I read the recent article by Finnerty and colleagues with interest [1] and
Figure 5  Infiltration into the interpectoral plane at infraclavicular level. PM, pectoralis major and Pm; pectoralis minor muscles; AA, axillary artery; AV, axillary vein.
Ultrasound description of Pecs II (modified Pecs I): A novel approach to breast surgery

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# ANATOMICAL BASIS OF PECS II BLOCK

## 1. Pectoral nerves - brachial plexus cords:

| a. Lateral pectoral nerve - C5-7, between pectoralis major and minor, supply pectoralis major. |
| b. Medial pectoral nerve - C8-T1, deep to pectoralis minor to supply pectoralis major and minor. |

## 2. T2-6 spinal nerves

| a. Lateral – pierces the intercostal muscles/serratus anterior give off anterior and posterior cutaneous branches |
| b. Anterior – pierces the intercostal muscles and serratus anterior anteriorly to supply the medial breast. |

## 3. Long thoracic nerve and thoracodorsal nerve:

| a. Long thoracic nerve – from C5-7, outer surface of serratus anterior to the axilla supplies serratus anterior. |
| b. Thoracodorsal nerve – from C6-8 via the posterior cord, runs deep in the posterior axillary wall to supply latissimus dorsi. |
Pecs II block

2 injections

- 1st injection - Pecs I
  (between pec major/minor)

- 2nd injection - between pec minor/serratus anterior muscle at the 3rd rib level
Suitable for more extensive excisions e.g. tumour resections, mastectomy, axillary clearance.

Other (non-breast) potential uses
- Proximal vascular
- Thoracoscopic
- Certain thoracotomy incisions (anterior-lateral)
- Axilla surgeries
CONCLUSIONS: Pectoral nerve block is a technique that improves the results obtained with thoracic paravertebral block in reconstructive breast surgery, with better post-operative analgesic control in the immediate post-operative period and a lower requirement for sedation.
Research Article

Thoracic paravertebral block versus pectoral nerve block for analgesia after breast surgery

Sherif Samir Wahba *, Sahar Mohammed Kamal

Results: Postoperative morphine consumed at 24 h was significantly lower in Pecs group [21 (20–25) mg] than in PVB group [28 (22–31) mg], (p = 0.002). Time for first request of morphine was longer in Pecs group [175 (155–220) min] than in PVB group [137.5 (115–165) min], (p < 0.001). Numerical rating score (NRS) at rest was lower in Pecs group compared with PVB group at 1 h, 6 h and 12 h (p < 0.001) but at 18 h and 24 h it was lower in PVB group compared with Pecs group (p = 0.008 and < 0.001 respectively). During movement, NRS was significantly lower at 1st hour in Pecs group (p < 0.001) while at 18 h and 24 h it was significantly lower in PVB group (p < 0.001). PONV was comparable between both groups.

Conclusion: Pecs block reduced postoperative morphine consumption in the first 24 and pain scores in the first 12 h in comparison with PVB after mastectomy.

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Evidence for PECS II efficacy…

**Ultrasound Article**

**Results:** Statistically significant lower visual analog scale pain scores were observed in the Pecs group than in the control group patients. Moreover, postoperative morphine consumption in the Pecs group was lower in the first 12 hours after surgery than in the control group. In addition, statistically significant lower intraoperative fentanyl consumption was observed in the Pecs group than in the control group. In the postanesthesia care unit, nausea and vomiting as well as sedation scores were lower in the Pecs group compared with the control group. Overall, postanesthesia care unit and hospital stays were shorter in the Pecs group than in the control group.

**Conclusions:** The combined Pecs I and II block is a simple, easy-to-learn technique that produces good analgesia for radical breast surgery.

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Evidence for PECS II efficacy...

Pectoral Nerve Blocks for Breast Cancer Surgery: A Methodological Evaluation

Accepted for publication: January 20, 2015.

To the Editor:

We read with interest the study by Bashandy and Abbas investigating the effect of pectoral nerve (Pecs) blocks on analgesia following modified radical mastectomy and wish to draw attention to some aspects of the methodology. The authors state that anesthetic management and data collection were performed by personnel blinded to the treatment group. It is clear that both the patient and the primary investigator who performed the blocks were not blinded to the treatment group, but there is no description of how the operating room anesthetist, recovery room staff, and data collectors remained blinded. Indeed, failure to use sham blocks renders confirmation of adequate blinding difficult. In addition, inadequate description of the randomization...
INDICATIONS FOR PECS II

- Non-consistent for said surgeries
- May be affected by volume? Site of injection?
- Basis for the work on Serratus Plane Block (SPB) or PECS III Block by Blanco (2013)
Serratus plane block: a novel ultrasound-guided thoracic wall nerve block

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- Study on 4 volunteers.
- The serratus plane block is a progression from work with the Pecs I and II blocks.
- Blockade of the lateral cutaneous branches of the thoracic intercostal nerves (T2–T12)
- Potentially for mastectomy and axillary clearance, more extensive thoracotomy, lat dorsi flap
Pecs III Block
Figure 2 Graphic representing probe position and ultrasound image obtained during a Pecs I block (left), Pecs II block (middle) or a serratus plane block (right).
Blocking of Multiple Anterior Branches of Intercostal Nerves (Th2-6) Using a Transversus Thoracic Muscle Plane Block

Accepted for publication: February 20, 2015.

To the Editor:

We read the recent article by Bashandy and Abbas regarding Pecs I and Pecs II blocks for breast cancer procedures. Many anterior branches of intercostal nerves (Th2-6) dominate the region of the internal mammary area. Intercostal nerves transverse on the space (transversus thoracic muscle plane, TTP) between the posterior and anterior intercostal muscles. The TTP is a potential plane for regional anesthesia between the third and fourth left ribs. We performed 4 mL levobupivacaine (0.15%) injection between the transversus thoracic muscle and the internal intercostal muscle connecting at the sternum (Fig. 1). A Pecs II was performed by administering 10 mL of 0.15% levobupivacaine between the pectoralis major and pectoralis minor at the third left rib and 20 mL of 0.15% levobupivacaine between the pectoralis minor and serratus muscles at the fourth left rib by using a 50 mm high-frequency linear probe in the S-Nerve ultrasound system (SonoSite Inc, Bothell, Washington). Ten minutes after completing the blocks, the postoperative analgesia was achieved.
- PECS Blocks
- PECS I
- PECS II
- Serratus Plane or PECS III
- QLB
FOR ABDOMINAL SURGERIES...

- **TAP Block**
  - Landmark approach
  - Classical TAP
    - (Shibata 2007, El-Dawlatly 2009)
  - Subcostal TAP
    - (Hebbard 2010)
  - Bilateral Dual TAP
    - (Borglm 2011, 2012)
“…one would block the nerves as peripheral as possible but only as centrally as necessary..”

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

F. W. Abdallah¹,²*, J. G. Laffey¹,², S. H. Halpern¹,³ and R. Brull¹,⁴,⁵

- The conclusion from this meta-analysis was that TAP block using the posterior approach reduced the rest and dynamic pain as well as the consumption of morphine for up to 48 hours postoperatively, whereas these outcomes were not seen with TAP block using the lateral approach.
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


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

was that TAP block using the posterior approach reduced the rest and dynamic pain as well as the consumption of morphine for up to 48 hours postoperatively, whereas these outcomes did not occur with TAP block using the lateral approach. This review aims to provide an academic evaluation of the possible

Carney et al described in a volunteer study that the original posterior TAP block technique resulted in the spread of local anaesthetic into the paravertebral space and that this might account for the prolonged analgesic efficacy compared to the lateral ultrasound-guided technique (7). Carney et al also found similarities (relative to the spread of local anaesthetics to the paravertebral space) when comparing the original landmark-based posterior TAP block technique with the so-called Blanco-block (7,8).

approach would benefit many patients undergoing major abdominal surgery. Both the lateral and posterior techniques provide good analgesia in the early postoperative period, but only the posterior technique is effective for 48 hours analgesia and with statistically significant reduction in opioid consumption. However, posterior landmark based TAP approach can be used by appropriately trained clinicians. We believe that ultrasound-guidance will be used for various posterior block techniques with increasing frequency when analgesia for more than 12 hours postoperatively is the intended wish of the anaesthetist; i.e. injections in the triangle of Petit guided by ultrasound, or it could be the USG Blanco block or the new USG transmuscular quadratus lumborum block (7,8,10).
EVOLUTION OF TAP BLOCK...

- Fascia Tranversalis Block
- Blanco Block (2007); pre-cursor to Quadratus Lumborum Block (QLB)

“a lumbar approach to the TPVS”
Simplified Anatomy of Abdominal Cutaneous Nerves

Pic 1: The course of Subcostal, IH and II Nerve via the QLC into the TA Plane
Fascia Transversalis Block

Quadratus Lumborum Block
Ultrasound-guided (USG) Quadratus Lumborum (QL) block: The best in abdominal surgery?

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Conclusion

All three block techniques showed considerable and extensive dermatomal anaesthesia of the abdominal wall. The TPV and the novel transmuscular QL block had a significantly more rapid block onset as compared with the original QL block.
Transmuscular Quadratus Lumborum Block (Posterior Approach) 
Borglum 2013

- Convex low frequency 5-2Mhz
- In-Plane technique
WHAT DETERMINES BLOCK SUCCESS?

- Actual injection site? Spread? Volume?
- Current literature suggests >15 ml but outcome papers suggest 20-30 ml
- Thoraco-Lumbar fascia injection may be key for optimal spread?
WHAT DOES THE EVIDENCE SAY?

- Still has lots to do in terms of determining types of surgeries for appropriate types of blocks, doses, best techniques and timing of administration
- TmQLB appears promising
- Only limited to case reports so far
Ultrasound-guided quadratus lumborum block as a postoperative analgesic technique for laparotomy

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Abstract

The quadratus lumborum (QL) block as a postoperative analgesic method following abdominal surgery has been described by Blanco for superficial surgeries but not used for major laparotomy. This ipsilateral QL block had low pain scores and opioid use on day one with sensory block up to T8-L1. The options of various volume used and pros and cons are discussed.

Key words: Postoperative analgesia, quadratus lumborum, ultrasound

Conclusion

Our case with QL block highlights its use in postoperative analgesia in major abdominal surgery. More case series for midline incisions and even appropriate randomized trial comparing TAP block are necessary to establish its role in clinical practice.
Ultrasound guided quadratus lumborum block or posterior transversus abdominis plane block catheter infusion as a postoperative analgesic technique for abdominal surgery

In conclusion, ultrasound guided QL catheter infusion had low pain scores with minimal use of opioid analgesia without any complication.

Sir,
Continuous catheter infusion of transversus abdominis plane (TAP) block provides as satisfactory analgesia as epidural in the postoperative period for abdominal surgery.[1,2] Single shot ipsilateral quadratus lumborum (QL) block has been reported to provide effective analgesia for 24 h.[3] A case of continuous unilateral QL block was reported in pediatric surgery.[4] This is the first report of continuous bilateral use in an adult laparotomy.
HKL EXPERIENCE

- For analgesia in nephrectomies (laparoscopic donor and open)
- Analgesia for hysterectomies, laparoscopic colonic resections
- As ANAESTHESIA for hernioplasty (with sedation)
- Reduce sensation to cold and pin-prick from T7 to L1
- Onset about 1 hour
CONCLUSION

- Still lots of questions need answering
- No large randomized trials yet
- We await further results on efficacy, reproducibility
- Small evidence so far looks promising
THANK YOU

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