

ambIT[®] PCA

The new standard in pain management

Australian Clinical Experience Report

Clinical Application of the AmbIT[®] PCA[†] in Transversus Abdominis Plane (TAP) Nerve Block Procedures

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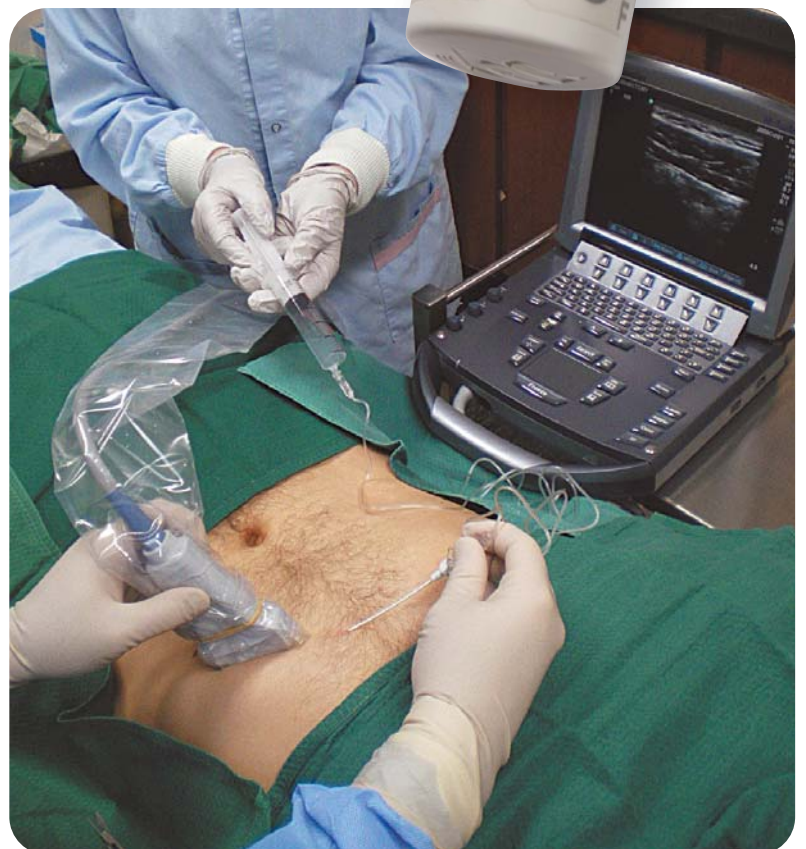
Overview of TAP Nerve Block Procedures^{1,2}

TAP nerve blocks aim to interrupt nerve conduction from the anterior and lateral abdominal wall to provide analgesia for abdominal incisions.

The abdominal wall nerve supply is highly overlapping from different spinal nerves, and the nerves within the layer superficial to transversus abdominis muscle – the TAP – are more accurately described as a large plexus than as individual nerves.

The intercostal nerves continue beyond the end of the intercostal spaces by passing deep to the cartilaginous costal margin (above the 10th rib) or by passing directly from the intercostal space to the TAP for the lower nerves.

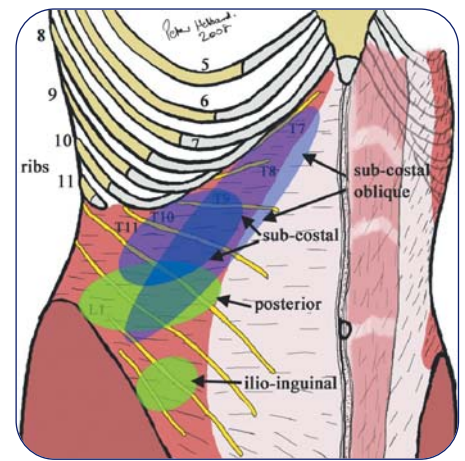
The innervation is from the 6th spinal segment at the xyphoid to the L1 segment in the inguinal region. The TAP can be divided into overlapping zones, referred to as posterior and subcostal TAP blocks. A relatively novel procedure – the oblique subcostal approach – is briefly described below.



Continuous Oblique Subcostal TAP Nerve Block^{1,2}

This approach is for longer wounds requiring ongoing analgesia. All the zones within the TAP can be linked with a single needle pass starting near to the costal margin in the upper abdomen, passing into the TAP and then along it towards the anterior superior iliac spine (ASIS), hydro-dissecting the plane open as the needle is advanced. This is best performed with a long needle (e.g. 20cm Eldor® touhy needle) which can then be used to leave a catheter in the TAP for infusion.

The oblique subcostal catheter is tailored in length and position to suit the wound, with regard to the general anatomy of the nerves. The needle and catheters can be passed in the superior to inferior direction, although it is also feasible to pass the needle in the opposite direction (towards the xyphoid). An extension set is used on the injecting syringe, with up to 40ml of dilute local anaesthetic injected (ideally by an assistant) as the needle is moved.



Placement of an oblique subcostal TAP block.

Clinical Applications²

I have used oblique subcostal TAP infusions for analgesia in many types of abdominal surgery, with large hernia repairs in the midline proving most effective (except where the repair extends laterally beyond the anterior branch territory). The benefits of TAP techniques over epidural include the lack of hypotension and motor block in the legs.

Additionally, as the surgery for hernia repair is confined to the abdominal wall and usually completely within the area of the anterior branches, the analgesia is profound, promoting patient mobility whilst keeping them comfortable and reducing nursing load.

Patients having surgery involving the abdominal contents usually benefit from PCA opioid, particularly in the first 12-24 hours as the TAP infusion does not cover intra-abdominal and visceral pain.

Equipment required for oblique subcostal TAP block infusion²

- ▲ High frequency linear ultrasound system
- ▲ Probe cover
- ▲ 80ml of 0.25% ropivacaine in syringes
- ▲ Two ambIT® PCA pumps running 0.2% ropivacaine at up to 7ml/hr each
- ▲ Two Eldor® 20cm touhy needle and catheter sets (to run the infusions).



ambIT® PCA: for bolus regimes and continuous infusion

Use of the ambIT® PCA in TAP Nerve Block Procedures²

I prefer to use the ambIT® pump for regional anaesthesia infusions because of the flexibility the system offers: there is no need to fill any containers (minimising the potential problems of maintaining sterility); the system is easily transportable and hence promotes patient mobility; the pumps are very flexible in modes such as intermittent bolus and infusion regimes (both have been equally effective in clinical use); enables PCA bolus delivery of up to 20ml and lockouts of up to 4 hours, allowing for flexibility.

For the same reasons, I also prefer the ambIT® system for peripheral limb infusions.

For further information on continuous oblique subcostal TAP block infusion, contact Dr Hebbard: p.hebbard@bigpond.com

The innovative ambIT® PCA infusion pump provides a simple yet sophisticated solution for all types of post-operative pain management:

- ▲ Simple, programmable operation provides versatility in drug delivery profiles.
- ▲ Flexibility to modify profiles during treatment to meet the unique needs of each patient.
- ▲ Small, lightweight and portable, enhancing patient mobility, comfort and recovery.
- ▲ Sophisticated design provides occlusion alarm, audible alerts and anti-free flow protection resulting in enhanced patient safety.

Other Clinical Applications of the ambIT® PCA

- ▲ Acute trauma (lumbar plexus and sciatic nerve block)³
- ▲ Popliteal sciatic nerve block⁴
- ▲ Interscalene nerve block⁵
- ▲ Infraclavicular nerve block⁶



The ambIT® Infusion System — Superior Pain Management

The innovative ambIT® PCA (Patient Controlled Analgesia) infusion pump provides a simple yet sophisticated solution for all types of postoperative pain management.

Continuous Regional Nerve Blocks and Surgical Site Infusions

The ambIT® system is well suited for ambulatory pain management and has several advantages in comparison to elastomeric infusion devices for regional nerve blocks and surgical site infusions.

Numerous clinical trials have demonstrated that the ambIT® can safely administer accurate dosages of local anaesthetic into regional nerve and surgical sites, with high levels of satisfaction from both patients and clinicians.

The ambIT® offers increased safety and accuracy

- ▲ Flow occlusion and flow accuracy alarms.
- ▲ Higher levels of accuracy than elastomeric devices – ambIT has accuracy of + or – 6 % where elastomeric devices can exhibit up to + or – 25%.
- ▲ Allows for an accurate measure of medication delivered. Monitoring of elastomeric devices rely on subjective judgment.

The ambIT® offers increased flexibility and mobility

- ▲ Ability to program bolus/lockout and continuous flow rates.
- ▲ Ability for a clinician to titrate dosages based on history reports.
- ▲ Compact design and carry bag allow patients to mobilise and be candidates for early discharge.

Which technology would you trust for your post-operative pain management?

PRODUCT COMPARISON



Elastomeric Pumps

- ▼ No programming flexibility
- ▼ Less accurate flow-rate
- ▼ No safety alerts or alarms
- ▼ High-cost for low technology

ambIT® Electronic Infusion Pump

- ▲ Simple, programmable operation
- ▲ Volumetric accuracy of $\pm 6\%$
- ▲ Visual and audible safety alerts
- ▲ Low-cost for high technology



Small, lightweight and portable, the ambIT® Infusion Pump provides the accuracy, safety, and ease-of-use you should expect from your post-operative pain management device.

Technical Information

- ▲ ambIT® PCA Pump - Basal Rate and/or PCA Bolus with Infusion History Report
- ▲ Volumetric Accuracy $\pm 6\%$
- ▲ Maximum Basal Flow Rate 20ml/hr
- ▲ Minimum Basal Flow Rate 0.1ml/hr
- ▲ Basal Flow Rates 0 to 20ml/hr in 0.1ml/hr steps
- ▲ Stroke Volume 50microliters
- ▲ Bolus Delivery Rate 100ml/hr
- ▲ Bolus Dose Volume 0 to 20ml in 0.1ml steps
- ▲ Bolus Lockout Times (hr:min) 00:05, 00:10, 00:15, 00:20, 00:30, 00:45, 1:00, 1:30, 2:00, 4:00, 8:00, 12:00
- ▲ Volumes to be Infused (ml) 25, 50, 75, 100, 150, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800, 900, 1000
- ▲ Pump Mechanism Microprocessor Controlled Rotary-Peristaltic
- ▲ Maximum Infusion/Occlusion Pressures 25 +/- 12 psi
- ▲ Maximum Activation Time of Occlusion Alarm 4 hours (minimum rate) at Minimum Occlusion Pressures
- ▲ Maximum Activation Time of Occlusion Alarm 90 seconds (intermediate rate) at Maximum Occlusion Pressures
- ▲ Dimensions 2.16in. x 1.4in. x 6.875 in. (55mm x 36mm x 175mm)
- ▲ Weight 4.7 ounces (133.2 grams) without batteries
6.4 ounces (181.4 grams) with batteries
- ▲ Power Supply 2 AA alkaline 1.5V batteries
- ▲ Battery Life (rate dependent) 14 Days @ 1ml/hr, 2 Days @ 10ml/hr

- ▲ Operating Controls: RUN/PAUSE Button, BOLUS Button, Remote BOLUS Button, ON/OFF Twist Cap
- ▲ Display, Audible Alarms, Signals and Reports:
 - Run Indicator Light Bolus Infusing
 - Pause Indicator Occlusion Downstream (25 +/- 12 psi)
 - Low Battery Dead Battery
 - Malfunction Cassette not Mounted on Pump
 - Boluses Requested Infusion Complete
- ▲ History Reports:
 - Volume Infused Boluses Delivered
 - Boluses Requested Elapsed Time
- ▲ Delivery Profiles:
 - Basal Rate + Bolus Basal Rate Only



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