Laparoscopic Guided Transversus Abdominus Plane (Tap) Block – A Modified Technique

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Abstract
We present a modified laparoscopic technique to administer quick and effective Transversus Abdominus Plane (TAP) block. The technique combines the benefit of laparoscopic guidance along with the knowledge of radiological anatomy of the abdominal wall.

Keywords: TAP Block.

Background
Whilst performing ultra-sound guided TAP block, we have observed the distance between the peritoneum and the neuro-vascular plane (plane between transversus abdominus and internal oblique) in the mid-axillary line to be relatively constant between 3-4 mm (figure. 1). This was further confirmed on ultra-sound scanning of 10 healthy volunteers by our radiologist. This anatomical fact has been utilised as the basis of current Laparoscopic guided TAP block technique.

Surgical technique
Pneumo-insufflation is induced by open Has on cannulation of the umbilicus. A 21gauge graduated regional anaesthesia needle (UniPlexNanoline, Pajunk® - figure. 2) is inserted through the skin in the mid axillary line midway between the costal arch and the iliac crest. The needle is advanced slowly until the needle tip reaches sub-peritoneal plane, easily identified on laparoscopy by peritoneal tenting. Caution is exercised by inserting the needle slowly so as to avoid any peritoneal puncture. Guided by the markings on the needle, the tip is then withdrawn by 3-4 mm so as to enter the neuro-vascular plane of the anterior abdominal wall. 20 ml of 0.25% Bupivacaine is then injected in this plane on each side (for bilateral blocks). The correct position of needle tip is confirmed by a slowly spreading bulge on laparoscopy (figure. 3).

Figure 1. Abdominal wall ultrasound showing distance between the peritoneum (P) and the Transversus abdominus plane (TA).

Figure 2. Pajunkuniplex regional anaesthesia needle (21 gauge) used for the technique.
Discussion and Results

TAP block first described in 2001 [1], is an effective technique in providing post-operative analgesia especially following lower abdominal incisions [2]. Conventionally the block is performed using the classical ‘double pop’ technique or under ultrasound guidance. Laparoscopic guided TAP block first described in 2011 [3], is a simple and easy alternative obviating the need for an operative ultrasound.

The current technique combines the merits of ultrasound guided and laparoscopic guided techniques to enhance the speed and accuracy of the TAP block. Direct laparoscopic visualisation of the needle tip renders the technique much faster when compared to ultrasound guidance. Knowledge of radiological anatomy as confirmed by our ultrasound studies helps to increase the accuracy of drug delivery in the correct plane. We have used this technique on 30 patients undergoing laparoscopic lower abdominal procedures (hernia repairs and appendectomies). All these patients did well with only two patients requiring post-operative opiates. Further trials are being planned to confirm these findings.

References