Ultrasound guided posterior versus oblique subcostal transversus abdominis plane block for pain relief in children undergoing laparotomy

Thesis

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Abstract

Assessment techniques can be classified as self-report; behavioral observation, or physiologic measures. Assessments that use multiple measures (behavioral and physiologic) and that assess different aspects of the pain experience may result in more accurate appraisal of children's pain experiences.

Key word

Abdominis , Anesthesiology , oblique

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List of Abbreviations

ACTH	Adreno-corticotrophic hormone
ADH	Anti diuretic hormone
ASA	American society of Anesthesiology
ASICS	Acid sensing ion channels
ASIS	Anterior superior iliac spine
BMI	Body mass index
CHEOPS	Children's Hospital Eastern Ontario Pain Scale
CNS	Central nervous system
COX-2	Cyclooxygenase-2
DCIA	Deep circumflex iliac artery
DIEA	Deep inferior epigastric artery
DRG	Dorsal root ganglion
ECF	Extracellular fluid
Fig.	Figure
FPS-R	Faces pain scale-Revised
ICF	Intracellular fluid
IL	Interleukin
L	Lumbar
MCL	Mid clavicular line
mg	milligram
MHZ	Mega Hertz
Na^+	Sodium
Na_v	Voltage gated sodium channel
NSAIDS	Non steroidal anti inflammatory drugs
NMDA	N-methyl- D- aspartic acid
OPS	Observational pain score
osTAPB	Oblique subcostal TAP block
PACU	Post anesthesia care unit
PNS	Peripheral nervous system
PROSPECT	Procedure-Specific post-operative Pain Working Group
pTAPB	Posterior TAP block
RCT	Randomized controlled trial
SD	Standard deviation
T	Thoracic
TAP	Transversus abdominis plane
TGC	Time gain compensation

TNF	Tumor necrosis factor
TRPs	Transient receptor potential channels
TTX	Tetrodotoxins
2D image	Tow Dimensional image
US	Ultrasound
VAS	Visual analogue scale
β	Beta
δ	Delta
μg	Microgram

Introduction

Regional anesthesia and analgesia techniques are commonly advocated for pain control in pediatric surgical practice. Regional techniques decrease parenteral opioids requirements and improve the quality of post operative pain control and patient-parent satisfaction. The most commonly used technique is caudal anesthesia, which is generally indicated for urologic surgery, inguinal hernia repair and lower extremity surgery. Complications are rare, however the caudal technique is limited in its ability to provide analgesia to the abdominal wall and for surgical procedures involving mid and upper abdomen. A reasonable alternative for these surgical procedures is to perform a lumbar epidural. This provides excellent analgesia and complications are not common. However, when complications do occur they are not minor. Because of the risks and potential complications of epidural catheter insertion, current clinical experience reveals fear of parents to consent to this technique. [1]

A substantial component of pain experienced by patients after abdominal surgery is derived from the abdominal wall incision. The skin, muscles and parietal peritoneum of the anterior abdominal wall are innervated by the lower six thoracic nerves and the first lumbar nerve. They pierce the musculature of the lateral abdominal wall to course through a neuro-fascial plane between the internal oblique and the transversus abdominis muscles. The transversus abdominis plane thus provides a space into which local anesthetic can be deposited to achieve myo-cutaneous sensory blockade. [2, 3]

McDonnell and O'Donnell (Anesthesia and Analgesia 2007) were interested in the previous information and described an approach to the blockade of the neural afferents to the anterior abdominal wall. This approach is the posterior transversus abdominis plane block via the bilateral lumbar triangle of Petit. They described its efficacy in post operative analgesia in patient undergoing bowel resection with midline incision. [4]

Dr. Hebbard P. (Anesthesia and Analgesia 2008) described another approach. This approach is the oblique subcostal transversus abdominis plane block (Ultrasound guided). He thought that this approach can provide better analgesia in case of laparotomy extending supra-umbilical. [5]

There are only a few studies available in the literature that have compared the safety and efficacy of posterior versus oblique subcostal transversus abdominis plane block in providing reliable pain relief in children undergoing laparotomy with incision extending supra-umbilical.

*The **aim of this study*** is to compare between the previously mentioned two approaches (the posterior transversus abdominis plane block which is easy applicable versus the oblique subcostal approach which is more complex) as regards degree of pain relief, effect on hemodynamic stability and incidence of complications.

ANATOMY OF ANTERIOR ABDOMINAL WALL