Editorial

The erector spinae plane block: plane and simple

A new regional anaesthetic block technique is described in this issue of *Anaesthesia* by Chin et al. whereby local anaesthetic is injected within a plane beneath the erector spinae muscle to achieve analgesia for abdominal surgery [1]. A review of the sono-anatomy presented suggests that this is a simple block to perform, and is probably safe. But is this investigation of yet another new block conducted merely for discovery’s sake, or is the erector spinae plane (ESP) block addressing a problem that is crying out for a solution?

**Problems**

To understand the value of new techniques, we need to explore how they refine current practice. Improved standards in peri-operative care can be attributed to a wide range of changes to clinical conventions. One of the most significant breakthroughs in recent times has been the introduction and global uptake of enhanced recovery after surgery (ERAS) [2], particularly in the cohort of patients having abdominal surgery. Early pre-operative assessment, screening, education and optimisation complements peri-operative measures such as carbohydrate loading, antibiotic prophylaxis, thromboprophylaxis, thermoregulation, goal-directed fluid therapy and multimodal analgesia [3]. There remains limited high-quality evidence regarding the value of each element [4], contributing to heterogeneity in the precise components of existing protocols. However, the overarching concept of a bundle of peri-operative interventions to improve outcomes can be both cost-effective and globally applied [5, 6].

The responsibility thus falls to the anaesthetist to modify management to increase both quality and outcomes of peri-operative care. Multimodal analgesia is critical both to ERAS [2] and to achieve the target of DREAMing (DRinking, EAting and Mobilising) [7]. Regional anaesthesia complements and enhances multimodal analgesia for abdominal

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surgery, with its role increasingly recognised [8], and may indeed alter outcomes [9–11]. However, which regional anaesthetic technique is most appropriate, efficacious, safe, timely and consistent in the hands of most practitioners remains highly debated. Moreover, the possible permutations for achieving goals of ERAS are virtually limitless, leaving practitioners with no gold standard in peri-operative analgesic strategies.

Solutions
Thoracic epidural analgesia has long been viewed as the standard analgesic blueprint to avoid systemic opioids and the adverse effects accompanying them [12–14]. Although effective analgesic outcomes are certainly evident, thoracic epidural analgesia does not reliably reduce hospital stay, incidence of ileus, or postoperative complications after open abdominal surgery [15]. In minimally-invasive abdominal surgery, however, the data lends very little support for the use of epidural analgesia as part of a multimodal strategy. For example, in the USA, epidural analgesia is only used in around 2% of laparoscopic procedures and when this approach is used, it is associated with increased hospital stay and healthcare costs, and may potentially have a greater complication rate compared with conventional analgesic strategies [16]. These effects precisely contradict the goals of ERAS, and have led to some calling for epidural analgesia to be withdrawn from ERAS pathways [17].

Similarly, intrathecal analgesia has been incorporated in some ERAS protocols, and demonstrates improved outcomes when compared with epidural analgesia in minimally invasive abdominal surgery [18]. However, the analgesic benefits demonstrated with central neuraxial blockade do not seem to outweigh the inherent risks, and spinal anaesthesia in the context of minimally invasive abdominal surgery may be perceived by some as unnecessary [19].

Thoracic paravertebral blocks have recently shown promise and an increase in clinical uptake due to the growing use of ultrasound-guided regional anaesthesia [20]. Their role in peri-operative analgesic strategies in breast and thoracic surgery are well established, but the efficacy of thoracic paravertebral blocks has yet to convincingly justify their use in abdominal surgery due to a limited evidence base [21]. The other, perhaps more pertinent barrier, is that ultrasound-guided thoracic paravertebral block is viewed as an advanced regional anaesthetic technique, being technically challenging, time consuming, and carrying with it not insignificant risks such as pneumothorax. As modern regional anaesthesia is now highly subspecialised, and in-depth teaching and training are required for competence in each block [22], it is becoming more difficult to deliver training in techniques such as ultrasound-guided thoracic paravertebral block within training programs that have an unpredictable clinical workload [23].

Should we, therefore, limit the scope of blocks taught to anaesthetists who have not completed a regional anaesthesia fellowship [24]? If the answer is yes, this may lead to patients being denied opiate-sparing analgesia as their anaesthetist lacks competence for performing more advanced blocks. The other option is the quest for simpler alternatives to these more advanced techniques.

The rise of the fascial plane block
Significant efforts have been made in recent years to identify such alternative regional anaesthetic strategies for abdominal surgery, and the recent interest in fascial plane blocks in this clinical setting may signal a paradigm shift by displacing thoracic paravertebral blocks [25, 26]. With the first descriptions of the landmark guided transversus abdominal plane (TAP) block, we witnessed the birth of the fascial plane, or myofascial plane block and an exciting new avenue in clinical research (Fig. 1). Transversus abdominal plane blocks have been embraced by both regional and non-regional anaesthetists alike in recent years. As a fascial plane block, it is a relatively easy technique to perform for those who do not utilise an ultrasound probe as part of their daily routine, and significant risks, such as intraperitoneal injection or injury to intraabdominal viscer, are rare [27]. However, there are a multitude of approaches [28], some requiring four separate injections [29], producing variable endpoints of analgesia. Furthermore, despite showing early promise, the evidence for the true efficacy of TAP blocks is increasingly being questioned [30, 31], as eloquently discussed by Chin et al. with particular reference to ventral hernia surgery [1].

These deficiencies in the TAP block were recognised, leading to the development of the quadratus lumborum block. This is a fascial plane block that has been proposed
for abdominal surgery, achieving analgesia by supposed spread of local anaesthetic to the thoracic paravertebral space. Yet again, a number of different ultrasound-guided approaches have been investigated with a lack of clarity on the true mechanism of action [32]. Moreover, the quadratus lumborum block is also seen as a time-consuming, advanced block that is technically challenging to perform, and has made little impact on the practice of non-regional anaesthetists in their care of patients having abdominal surgery.

Perhaps the time has come to explore less invasive, safer and quicker alternatives to current standards of analgesia that are accessible to anaesthetists whose daily practice does not involve wielding an ultrasound probe? We need, something plain (plane!) and simple that can be performed by many and is therefore accessible to all patients. Does the ESP block fit the bill for abdominal surgery? Can it work hand in hand with multimodal analgesia strategies and still respect the tenets of ERAS?

Part of the appeal of the ESP block could be that it is gaining indirect access to the paravertebral space and providing analgesia without the potential for needle-pleura interaction and consequent risk of pneumothorax. Chin et al. [1] are not the only ones to have caught onto this idea, with other investigators heading back to the cadaver lab with their ultrasound machines and methylene blue [33]. The sole aims for the practitioner are to identify erector spinae muscle above transverse process, direct the needle to the bone and inject local anaesthetic. This is conceivably something that could also be performed relatively simply in the obese patient, making it an attractive option.

The unknowns of the ESP block

It is early days to recommend a change in practice based on a case series of four patients, and we would exercise a cautious approach when interpreting the data presented by Chin et al. [1]. For example, the use of non-standardised additives and the variable local anaesthetic doses, often at the upper dose limit, and the variable spread of local anaesthetic in the cadaveric data, leaves question marks regarding consistency of the ESP block. It could also be argued that the doses of peri-operative opiate that some of the patients in this study were exposed to were not insignificant. Additionally, a large number of ESP blocks will need to be reported on in order to truly assess the safety and efficacy of this technique. Finally, the data reported here is non-comparative, and does not tell us if this block is better than no block at all. It would be most useful to have a comparison to alternative techniques, including surgical infiltration of local anaesthetic, and this will need well-designed randomised controlled trials to be performed.

What is the optimal analgesic strategy for minimally invasive abdominal surgery? We suggest it is the technique that can be performed by all, quickly and simply, is reliable and consistent, is opiate-sparing, and has minimal complications – we find it exciting that the ESP block could potentially be the answer. What remains is hard proof for the clinical efficacy and safety of this block, followed by a demonstration of the uptake of it in the
hands of non-regional anaesthetists. The lack of meaningful outcome benefits of TAP blocks serves as a lesson to incorporate new regional anaesthetic techniques with caution; only time will tell if the ESP block can fulfil its true potential.

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References


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