the technique described by Mokini and colleagues actually is a well-known approach of the PCB rather than a modification of a PCB as suggested by the authors. However, as rightly recognized by the authors, the use of this technique has some restriction which should be known to physicians before considering this technique for inguinal surgery. In contrast with lower lumbar dermatomes, the higher lumbar dermatomes are unreliably blocked by a PCB, regardless of which approach has been used. A possible explanation for this is the anatomic location of the lumbosacral plexus. Kirchmair and colleagues reported that in the majority of cases, the lumbosacral plexus lies within the psoas major muscle, and not inside a sheath between the muscles. We wonder if the reproducibility of this technique was also tested in a hernia repair patients group.

Furthermore, the authors rightly pointed out some serious complications of a PCB such as hypotension, epidural- or subarachnoid spread, systemic toxicity, renal puncture, and retroperitoneal hematoma. A more cephalad approach of the PCB like the L2–3 approach suggested by the authors could be more prone to an unattended puncture of the kidney. The most frequently occurring undesirable side-effect of a PCB is a bilateral spread of the injected local anaesthetics, resulting in epidural anaesthesia. It was previously thought that the occurrence of bilateral spread depended on the approach taken for a PCB. However, Gadsden and colleagues concluded that injection of a local anaesthetic with high injection pressure (≥ 20 psi) during lumbar plexus block commonly results in unwanted bilateral block and is associated with high risk of neuraxial block. Mokini and colleagues did not describe any injection pressure or assessment of bilateral local anaesthetic spread in their patient(s). In theory, the suitability of the PCB as anaesthetic technique for inguinal hernia repair suggested by the authors could be erroneously attributed to unnoticed epidural anaesthesia.

Finally, in a time of increased emphasis on patient safety, information with regard to success rate or complication rate of this technique for inguinal surgery is needed. In that sense, some data with regard to the number of patients anaesthetized with this technique and the reliability of the result thereof would have been helpful. Until then, in our opinion, the lack of reliability regarding blocking dermatome L1, together with the fact that this technique probably does not anaesthetize manipulations of the spermatic cord and the peritoneum sac (also described by Mokini and colleagues), makes this technique unsuitable for most patients undergoing inguinal hernia surgery.

Declaration of interest
None declared.

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L1–2 roots block with psoas compartment block?

Reply from the authors

Editor—We thank Drs de Leeuw and Perez for their interest in our letter and we would like to make a few comments.

Our modification of the psoas compartment block (PCB) technique is that we aim at eliciting the twitch of the lower anterior abdominal wall (i.e. L1–2 root stimulation), instead of searching for the quadriceps twitch (i.e. L3–4 root stimulation), in order to increase the chance for a successful block and avoid femoral and obturator block, see Figure 1 and accompanying video.

In selected inguinal hernia patients where local anaesthetic infiltration was not possible and general or neuraxial anaesthesia was at high risk or impossible to perform, we found reasonable to propose PCB at L2–3 level for three main reasons. First, there is a higher probability to find L1–2


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roots with a stimulated needle placed at L2–3 level since L1–2 terminal rami are found into the substance of the psoas muscle below this level. Secondly, Mannion and colleagues, using MRI, have shown the cephalad spread of contrast media and involvement of L1–4 roots within the psoas muscle by expansion of the intrapsoas fascia after PCB performed as low as L4–5 level. Hanna and colleagues also demonstrated a spread to L1–4 roots in all cases after PCB at L2–3 level using a loss of resistance technique with only 10 ml of dye in cadavers. However, the limited number of experiments in anatomic and imaging studies may not reflect the features of the general population and caution is needed when they are translated to clinical practice.

Thirdly, clinical randomized trials in adults and children confirm the findings of anatomic and imaging studies. Imbelloni and colleagues reported L1–2 involvement in 92% of patients with analgesia lasting ~21 h after PCB with 40 ml of bupivacaine at L3–4 level. Kirchmair and colleagues reported effective anaesthesia and analgesia of the inguinal region in children after PCB with ropivacaine at L4–5 level. Ozkan and colleagues reported L1–2 involvement in 92% of patients after 5 ml of bupivacaine injected at L1 level. Pandin and colleagues reported 77% and 100% success in blocking L1 and L2 roots, respectively. Mannion and colleagues reported 70% of L1–2 block rate, but we could not find this information in the listed reference. Taken together, these data suggest that even classic PCB could extend to block L1–2 roots in an acceptable proportion of patients.

We cannot offer at the moment a large and consecutive series of patients, but in the past 3 yr, we have performed PCB in 20 patients.

The mechanism for analgesia after L2–3 approach may be due both to the anaesthetic solution spreading to L1–2 roots into the psoas sheath and to the paravertebral space outside the fascia. We have had no cases of contralateral analgesia. Since the L3 transverse process is the longest, the chance for epidural or subarachnoid spread may be reduced, and also the occurrence of sympathetectomy or puncture of the inferior cava vein or aorta. Despite this advantage, psoas major is narrower at L2–3 level, requiring more accurate needle positioning. We did not measure injection pressure, but we usually inject the anaesthetic slowly. Infiltration of skin (T11/T12 contribution), spermatic cord, or peritoneum and sedation may be needed, but these same events may occur also during inguinal field block performed by surgeons. Finally, we have had two cases of transient homolateral hypoaesthesia over the anterior thigh (lasting <4 h).

In conclusion, we think that further research is needed to evaluate the optimal PCB technique in order to achieve L1–2 root block for hernia surgery. This level can be potentially reached in a good proportion of patients and may be useful in challenging anaesthetic situations.

Declaration of interest
None declared.