

tourniquet pain. In our study, we felt that the risk/benefit ratio of a third (obturator) block in addition to femoral and sciatic block was unfavorable.

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Caudal anaesthesia safety for hypospadias repair

Kim et al. reported an association between caudal block and postoperative complications following primary hypospadias repair [1, 2]. I have also studied this subject [3], and would like to ask the authors about certain aspects of their methodology.

In this paper, the caudal and non-caudal groups appear to differ [3, 4], with the caudal group containing significantly more proximal hypospadias repairs. Proximal hypospadias is associated with a much higher incidence of all of the complications that were evaluated in this study. When evaluating distal hypospadias alone, the incidence of fistula and all other complications was comparable between the two groups, as noted in the accompanying editorial [2] and found in other papers [3, 5]. The abstracts by Soto-Aviles et al. [6], cited in the accompanying editorial in support of an

association between caudal analgesia and fistula following hypospadias repair, have yet to be published in a peer-reviewed journal and must be viewed with caution. Published data support the safety of caudal anaesthesia for distal hypospadias repair.

Secondly, why was a composite outcome used? It is unclear how urethral stricture, diverticulum, wound infection or haematoma could be influenced by caudal anaesthesia. Ayob and Arnold's accompanying editorial suggests that oedema contributes to fistula formation [4], but oedema is not known to be a consequence of epidural or caudal anaesthesia. The author's conclusions focused on the role of caudal anaesthesia, even though their results appeared to confirm previous work associating fistula formation with longer operations and hypospadias location.

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Caudal anaesthesia safety for hypospadias repair – a reply

We thank Haydar for his interest in our paper [1]. The caudal block group included a higher proportion of children with proximal hypospadias than the non-caudal block group, so we undertook multivariate logistic regression to analyse the independent effect of the caudal block on the occurrence of surgical complications, excluding the effect of hypospadias type.

We agree that our paper and others [2, 3] show that there is no difference in complication rate after distal hypospadias repair with or without caudal block, suggesting that caudal blocks are safe. However, given that the surgical complication rate after distal hypospadias repair is very low to begin with [4], a larger sample size may be needed in future studies to detect the adverse effects of caudal blockade in this patient population.

Kundra et al. showed that penile size increased immediately after caudal block in children undergoing hypospadias repair [5], and that all children who suffered from urethrocutaneous fistula had received caudal block. Although they were not able to identify how caudal block affected the occurrence of urethrocutaneous fistula, they suggested that penile engorgement after caudal block increases tissue oedema even though there is no direct evidence for this. A previous experimental study has shown that epidural block can increase water content in mesenteric tissue after mesenteric resection and anastomosis in pigs [6], which suggests that caudal blockade might increase postoperative oedema in certain types of tissue, and we agree with Kundra et al. that penile engorgement may place the surgical sutures under inappropriate tension, resulting in poor healing [5]. Both postoperative oedema and poor wound healing may contribute to the array of complications after hypospadias repair. Also, it should be noted that the pathophysiologies of urethral stricture, urethrocutaneous fistula, and diverticulum are all thought to be closely associated with urethral obstruction [7]. Therefore, we hypothesised that the caudal block could be associated with any type of complication, and a composite outcome was used as the primary endpoint.

We do not think that there is conclusive evidence to support or oppose the safety of caudal block in hypospadias repair. Our study was only able to report the association between caudal block and postoperative complications after

hypospadias repair in a retrospective data set. We absolutely agree with Ayob et al. that a large scale, prospective, randomised controlled trial is needed to shed more light on this issue [8].

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