Background

- Hypospadias is a congenital defect of urethral development in which the opening of the urethra is located on the ventral side of the penis, proximal to the tip. Surgical repair is the treatment of choice for hypospadias.
- Urethrocutaneous fistula is well known to be a major complication of hypospadias repair. Fistula formation is most often a result of meatal stenosis and poor vascular tissue coverage. However, a recent prospective study has suggested that caudal anesthesia may be associated with fistula formation.1 Given the commonality of regional blocks for penile surgery, we felt it important to further elucidate this possible association.

Methods

- With IRB approval and waiver of consent, we included children who underwent primary hypospadias repair from 1986 through March 2013.
- All cases of fistula were identified by independent review of surgical case lists and multiple repairs, and confirmed by a secondary review.
- Two matches for every case were randomly selected from the remaining surgical list as controls.
- Children with multi-stage repair, connective tissue and bleeding disorder, disorder of sexual development, and who underwent repair using buccal graft were excluded.
- Medical records were reviewed to obtain: age, medical history, details regarding caudal anesthesia, penile block, local infiltration, use of subcutaneous epinephrine, location of the urethral opening, type of repair, recovery characteristics, postoperative infection and outcomes.
- Chi square or Kruskal Wallis and multivariate logistic regression were used to evaluate the association between various perioperative factors and fistula occurrence.

Results

- The sample included 44 fistulas and 88 controls (2:1 matching).
- Snodgrass (77%) and MAGPI (19%) urethroplasty were the most common repair techniques used.
- The hypospadias defect was distal in 111 cases (84%), midshaft in 8 (6%), and proximal in 13 (10%).
- Pain was managed with caudal anesthesia in 99 children (75%), penile block in 22 (17%), local infiltrate in 82 (62%). Subcutaneous epinephrine was used in 71 cases (54%).
- Univariate analysis (Table 1) was performed to assess the association of fistula with various anesthetic and surgical risk factors. Surgical repair type, location of the urethral opening, local infiltrate, use of subcutaneous epinephrine, and postoperative infection were statistically associated with fistula occurrence. Fistula formation had a greater odds of exposure to proximal and midshaft hypospadias location.
- We subsequently performed a logistic regression, and the variables used in the multivariate analysis were selected on the basis of clinical relevance, which included repair type, anesthetic technique, subcutaneous epinephrine, location of urethral opening, and postoperative infection.
- In our model (Table 2), urethrocutaneous fistula occurrence was not significantly associated with use of caudal, penile block, or local infiltrate. When adjusted for all variables, the fistula group had a greater odds of exposure to subcutaneous epinephrine and more proximal location of the defect. However, neither repair type nor postoperative infection revealed a significant association with fistula formation.

Conclusion

- The type of regional anesthetic used in children undergoing primary hypospadias repair was not associated with urethrocutaneous fistula formation. Our findings argue against the conclusion of a recent prospective study by Kundra et al, which suggested that caudal anesthesia is associated with fistula formation.2
- We also found that the use of subcutaneous epinephrine is strongly associated with fistula development. This finding may be explained by compromised blood supply to the repair, resulting in tissue ischemia, and wound breakdown.
- The location of the urethral opening appears to be associated with fistula development, as previously described in the literature.3

References