Pediatric Urology Robotic Major Reconstruction: A Scoping Review

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BACKGROUND

- Robotic assistance has **expanded the scope** of minimally invasive major reconstruction in pediatric urology
- **Adoption varies**
- Comparative advantages over open surgery **remain uncertain**

Objectives:

1. Map evidence on robotic major lower urinary tract reconstruction in children, focusing on continent catheterizable channels (Mitrofanoff/Monti), bladder augmentation, and bladder neck reconstruction (BNR).
2. Compare perioperative and postoperative outcomes with open approaches.
3. Identify barriers and gaps to inform future research.

METHODS

- **Covidence** systemic review software
- **3 reviewers**: fellow, resident, & medical student
- Levels of screening: **title**, **abstract**, **full text**
- **67 studies** included

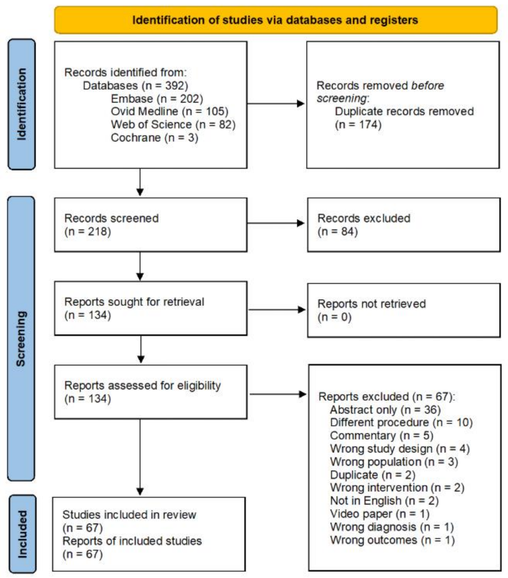

Figure 1. PRISMA-ScR flow diagram for the scoping review

Robotic major reconstructive surgery in children is **comparable to open surgery** for catherizable channels, bladder neck reconstruction, and bladder augmentation with potential benefits of **less blood loss**, **less pain**, and **shorter hospital stay** – though with **longer operative times**.

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Authors have no financial relationships to disclose.

RESULTS

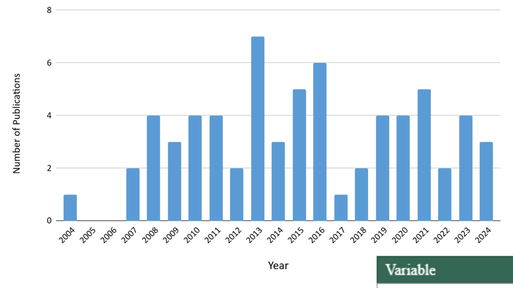

Figure 2. Number of publications per year on pediatric major reconstructive lower urinary tract urologic robotic surgeries

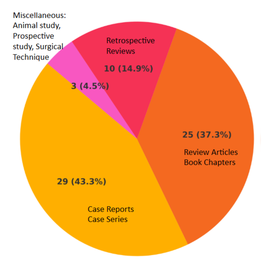

Figure 3. Distribution of Publication Types

Variable	Robotic	Open	p-value
Number of patients	136	121	—
Mean age (years)	10.9	7.8	0.1027
Mean OR time (minutes)	397	272	0.1217
Estimated blood loss (mL)	54.5	63.3	0.7805
Length of stay (days)	4.9	8.5	**0.0703**
Complication rate (%)	38	39	0.2433
Surgical intervention (%)	21	28	0.8998
Continence rate (%)	91.8	91.1	0.9052
Morphine equivalent (mg/kg)	0.36	0.65	**0.0329**

Table 1. Retrospective Reviews: Comparison Outcomes Between Robotic and Open Major Reconstructive Urologic Surgery

CONCLUSION

- Feasible and safe in experienced hands
  Outcomes broadly comparable to open surgery
- Potential benefits in analgesia and decreased length of stay
- Adoption remains constrained by pediatric anatomy, high costs, steep learning curves, and low case volume.
- Standardized definitions of continence, rigorous complication reporting, prospective multicenter data, cost analyses, and long-term functional follow-up are needed to optimize care.