

Single-port Robotic Surgery in Children

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Evolution of Pediatric Urologic Surgery

Single-incision surgery -----> Standard lap/robotic ports

I don't like visible incisions...







Evolution of Pediatric Urologic Surgery

Single-incision surgery ---> Standard lap/robotic ports

HIdES* ports









Evolution of Pediatric Urologic Surgery

Single-incision surgery



Single-incision surgery???



Single-port (SP) robotic platform

- FDA clearance for Urology in 2018
- 2.5cm, 4-channel port
- 12x10mm articulating camera
- 6mm multi-wristed instruments





Objectives

 Demonstrate feasibility of SP robotic platform in pediatric population

Report intraoperative details, perioperative outcomes



First SP robotic pediatric series

Pyeloplasty

- 2 female: age 10y, 6y
- 1 male: age 23 months
- Mitrofanoff
 - Female: age 10y



 2.5cm incision in Pfannenstiel line

- Retract port = increase working distance
 - 10cm needed for deploying elbows, wristing of instruments





SP robotic platform: instruments

- Maryland dissecting forceps
- Cadiere forceps
- Wristed needle driver
- Curved scissors



Results: Pyeloplasty

- All completed via single-port
 - No complications
 - Median operative time: 120 minutes
 - EBL: <5mL
 - liposomal extended-release bupivacaine (EXPAREL®) to incision for 10y, 0.25% bupivacaine for others
 - No opioids
 - Dismissed <24hrs on acetaminophen, ibuprofen PRN





Results: Mitrofanoff

- SP plus 5mm assist port
 - No complications
 - Operative time: 240 minutes
 - EBL: <5mL
 - Exparel
 - No opioids



SP robotic platform: Technical considerations

- Visualization:
 - Excellent; no different than with HIdES
- Instrument use/movement:
 - No difficulty
 - Deploy, triangulate without clashing <u>in the</u> <u>older children</u>











SP robotic platform: Limitations

• Difficult in smaller patient

- <10cm working distance → cannot deploy instrument elbows
 - No wristing
 - Working in straight-line



SP robotic platform: Limitations

- Loss of insufflation with use of lap instruments
 - Passing needles
 - 5mm laparoscopic suction
- Seal on port doesn't maintain closed system
- Rapid loss of working space



SP robotic platform: Recommendations

- Limit use to older children, teenagers
 - Need 10cm working distance
 - Can use Gel-Port to extend

 Place needles into abdomen after incision, before port placement

SP-specific suction device (but consider cost)



Conclusions

- Single-port robotic surgery is feasible in pediatric patients
- Patient selection is key
- Improvements to platform are needed to expand use











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