Assessment of the da Vinci Single Port (SP) Robotic Platform on Indirect Inguinal Hernia Repair in Adolescents

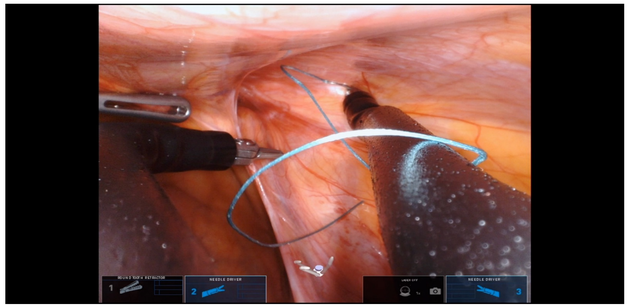
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Objective

The new da Vinci's single port (SP) robotic platform has great appeal for pediatric surgery. To assess the feasibility, efficacy and to identify potential challenges, nine adolescents underwent SP robotic-assisted inguinal herniorrhaphy and their results were evaluated.



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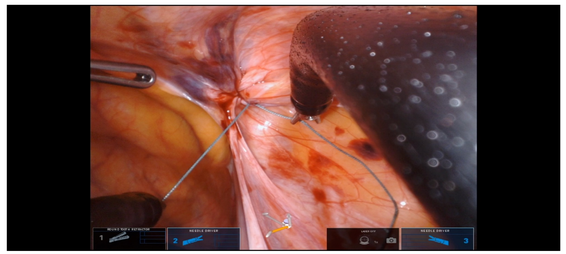


Description of the Technology

- SP is a 4th generation da Vinci surgical system.
- Through a single 2.5 cm cannula the surgeon controls three fully-wristed, elbowed instruments, and the first fully-wristed da Vinci endoscope.
- SP instruments can reach up to 24 cm deep and triangulate at the distal tip.
- Instruments can also reach anatomy anywhere within 360° of port placement.
- The SP was used for unilateral and bilateral hernia repair with an umbilical access port.
- 2-0 Ethibond sutures were passed through an instrument channel in the cannula.
- Sutures were placed extraperitoneally and circumferentially to complete a high ligation of the sac, taking care to avoid involving the vas deferens and spermatic vessels.
- No additional instrumentation was required.

Results

- All patients were ASA class I or II, outpatients.
- Mean age was 16 years old, mean weight was 76 kg, and 8/9 patients were male.
- In two cases an unsuspected contralateral hernia was identified and repaired.
- There were no fatalities and no returns to the operating room.
- The mean estimated blood loss was 2 ml and the mean case duration was 78 minutes.
- No patients used immediate postoperative narcotics.
- One adolescent reported some mild constipation and intermittent groin pain, but he did not return for repeat follow up.
- One patient presented a year later with a direct right inguinal hernia on the side of the previous repair.
- One final patient reported a nodule in the incision scar.





Conclusions

SP robotic platform hernia repair in adolescents appears to be safe and effective. The wristed movement of the robotic instruments improves the surgeon's dexterity over laparoscopy. The single incision is hidden in the contour of the umbilicus, providing cosmetic improvement and patients reported limited pain with a prompt return to full activity. Finally, the camera system allows identification of contralateral hernias, and the 360-degree rotation allows repair of bilateral inguinal hernias through a single incision. The cost, duration of procedure and long-term complications must all be further considered but this series sets an exciting precedent for the SP robotic platform and provides a glimpse of what is ultimately possible in pediatric robotic surgery.