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THE IMPORTANCE OF USING LAPAROSCOPIC DEVICES IN PEDIATRIC SURGERY

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Abstract: This paper examines on laparoscopic devices in pediatric surgery

Keywords: Laparoscopic, surgery, pediatrics, Physics, removal

Definition: Laparoscopic surgery is a procedure your child's doctor uses to avoid major surgery and a long healing time after surgery.

Introduction: Use of laparoscopic surgery in the pediatric population is common. Laparoscopy in children and adolescents bears marked similarities to adult procedures, but experience with adult surgery does not sufficiently translate to safe surgery in pediatric patients. Pediatric procedures must be performed with a full understanding of the relevant anatomic and physiologic differences between the pediatric and adult populations.

Laparoscopic surgery can be used to treat conditions affecting any abdominal or pelvic organ, including the stomach, gallbladder, liver, intestines, appendix, colon, kidney, spleen and ovaries.

Process: During laparoscopic surgery, surgeons create a few tiny incisions that are less than ¼ inch long. These incisions are much smaller than the ones that are needed for traditional open surgery. Carbon dioxide gas is then gently injected into your child's abdomen to lift the abdominal wall and create space for the surgeon to perform the procedure. A small video camera is then inserted into your child's abdomen, usually at the belly button. This camera guides surgeons during the procedure. Then, the surgeon inserts special instruments through the tiny incisions to perform the procedure.

Advantages: Like other minimally invasive techniques, laparoscopic surgery offers your child many benefits compared to traditional open procedures, including:

- Quick recovery - Children who undergo laparoscopic surgery have a shorter hospital stay and can return to school and their typical activities faster.
- Less pain - Because surgeons use very small incisions, children have less pain as they recover. They also need fewer pain medications, like opioids.

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- Minimal-to-no scarring - The small incisions result in very little scarring, if any.

Side effects: Despite being minimally invasive, it's possible to develop scar tissue internally after laparoscopic surgery. Scar tissue is minimal compared to open surgery. Pediatric surgeons practicing at Children's Health use the most advanced and gentle techniques to ensure your child has the least amount of scarring possible.

Types of laparoscopic surgery in pediatric

1. Appendectomy
   - Procedure: Removal of the appendix.
2. Cholecystectomy
   - Procedure: Removal of the gallbladder.
3. Hernia Repair
   - Procedure: Repair of inguinal or umbilical hernias.
4. Gastrostomy Tube Placement
   - Procedure: Insertion of a feeding tube directly into the stomach.
5. Nephrectomy
   - Procedure: Removal of a kidney.
6. Fundoplication
   - Procedure: Wrapping the top of the stomach around the lower esophagus to prevent reflux.
7. Ureteral Reimplantation
   - Procedure: Reattachment of the ureter to the bladder2.
8. Splenectomy
   - Procedure: Removal of the spleen.
9. Tonsillectomy and Adenoidectomy
   - Procedure: Removal of the tonsils and/or adenoids.
10. Varicocelectomy
    - Procedure: Ligation of varicose veins in the scrotum.

Laparoscopy and Physics:

- Pneumoperitoneum
- Physics of Gas Insufflation
- Instrumentation
- Physiological Changes
- Monitoring and Safety

Artificial Intelligence (AI) in Pediatric Laparoscopy:

- Image Analysis and Interpretation
- Surgical Planning and Simulation
- Robotic Assistance
- Postoperative Monitoring

Information Technology (IT) in Pediatric Laparoscopy:

- Electronic Health Records (EHRs)
- Telemedicine and Remote Consultation
- Data Analytics and Outcome Tracking
- Patient and Family Engagement

Conclusion: Laparoscopic surgery in children provides a minimally invasive approach, resulting in less postoperative pain, shorter hospital stays, and faster recovery times. By

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leveraging advanced technology and specialized surgical techniques, it ensures precise and safe treatments for various conditions. Overall, it significantly enhances the quality of pediatric surgical care and improves outcomes for young patients.

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