# EXPERIENCE IN SINGLE INCISION PAEDIATRIC ENDOSCOPIC SURGERY.

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# Introduction

- Single Incision Paediatric Endoscopic Surgery (SIPES): To increase the benefits of laparoscopic surgery, surgeons have developed new techniques to further decrease the trauma of surgery, and improve postop cosmesis.
- Evolution towards minimising the minimal invasive nature of laparoscopy.
- Umbilicus: natural scar. SIPES aim surgery with no visible scar.
- SIPES is a more accepted alternative to NOTES in children.

# Technical challenges

SIPES is technically more difficult than standard laparoscopy.

- Close alignment of camera and instruments results in loss of triangulation, clashing of instruments and restricted freedom of movement.
- Position of camera makes it difficult to see instrument tips because of limited in line view.
- Depth perception and field of vision is different.
- Different perception of anatomy.
- Tissue traction is a major challenge.

# Instrumentation

- Standard laparoscopic instrumentation.
- Roticulating instruments for Nissen and splenectomy.
- Long straight 3mm and 5 mm scope, 30° or 45°
- Standard 3 and 5 mm low profile trocars.
- Seldom multichannel port devices.





Preparation of umbilical site

- Vertical or trans-verse umbilical incision
- Extended sideways along both circumferential edges (yinyang)
- Pre-facial plane is created 1.5 cm circumferentially.
- Open method used through the umbilical facial defect.



Laparoscopic guided TAP block

- 25 gauge needle placed trans

   abdominally midway between iliac crest
   and costal margin in mid axillary line,
   into the plane between the transversus
   abdominis muscle and the internal
   oblique muscle.
- Injection of Marcaine blocks the T7 and L1 spinal nerve pathways.
- This effectively blocks the sensory innovation to the umbilicus.

# Single Incision Laparoscopic Pyloromyotomy

- Surgical technical aspects:
  - 3 separate stab incisions, using no.11 blade.
  - Camera port centre of umbilicus.
  - Insufflate before stab incisions on R and L side.
  - Traction suture catching inferior edge of falciform ligament.
  - Grasper L hand for traction on antrum.
  - Cutting current (8-10) surgeon's R hand, to make serosal incision.
  - Pyloric spreader in R hand is then used to split muscle.









Single Incision Laparoscopic Cholecystectomy

- Surgical technical aspects:
  - SIPES port (Covidien) or 3 separate stab incisions.
  - Conventional 5mm 30° laparoscope and standard straight instruments.
  - Straight instruments include:
    - Maryland dissector
    - Duck bill grasping instrument
    - L-hook cautery

- Trans abdominal suture (2-0 PDS) directly through abdominal wall and through gall bladder fundus for traction.
- Grasping forceps retract infundibulum of gallbladder laterally to create a right angled orientation of cystic duct.
- Straight clip applicator is used.
- Gall bladder dissected free from liver bed with hook cautery and retrieved from the abdomen through umbilicus.

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### Single Incision Morgagni Hernia

<u>Afr J Paediatr Surg.</u> 2013 Jan-Apr;10(1):55-7. doi: 10.4103/0189-6725.109401.

Laparoscopic Morgagni hernia repair using single-site umbilical and full-thickness abdominal wall repair: technical report of two cases.

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#### Source

Department of Paediatric Surgery, University of Pretoria, South Africa.

- Surgical technical aspects:
  - 5mm 30° camera and one or two 3mm needle holders.
  - Place interrupted sutures through full thickness abdominal wall.
  - Sutures incorporating posterior rim of defect and returning back out through anterior abdominal wall.
  - Sutures then tied in subcutaneous tissue.
  - Easy and excellent way to repair this hernia. Operating time same as standard laparoscopic repair.

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Single Incision Removal of Ovarian Cyst

- Surgical technical aspects:
  - 5mm camera port and 3mm grasper.
  - Needle aspiration of cyst under direct vision.
  - Cyst is grasped, camera removed and two stab incisions are connected.
  - Cyst is pulled to the outside and removed.

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Single Incision Meckel Diverticulum

- Surgical technical aspects:
  - 5mm 30° camera and two endoscopic graspers.
  - Meckel diverticulum is identified and grasped.
  - Stab incisions are connected and diverticulum pulled to outside.
  - Excision of diverticulum and suturing of bowel is done extra corporeally.

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### Single Incision Gastrostomy Tube placement

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Single Incision Bilateral Thoracoscopic Sympatectomy

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### SI Nissen Fundoplication

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- Surgical technical aspects
  - Horizontal incision from edges of umbilicus, extended sideways along both circumferential edges (Yin-Yang).
  - Central camera port using Hasson technique.
  - Two separate fascial stab incisions for working ports.
  - Long 35cm camera.
  - Standard straight instruments and roticulating dissector.

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JOURNAL OF LAPAROENDOSCOPIC & ADVANCED SURGICAL TECHNIQUES Volume 23, Number 4, 2013 @ Mary Ann Liebert, Inc. DOI: 10.1089/lap.2012.0434 **Technical Reports** 

Transumbilical Single-Incision Laparoscopic Fundoplication: A New Technique for Liver Retraction Using Cyanoacrylate

> Ying Fan, MD, PhD, Shuo-Dong Wu, MD, PhD, Jing Kong, MD, PhD, Yang Su, MD, PhD, and Yu Tian, MD, PhD

### Single Incision Hirschprung

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Single Incision Laparoscopic Imperforated Anus Repair

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# Conclusion

- SIPES is feasible and safe.
- SIPES results in excellent cosmesis. It leads to scarless surgery without the risk of the NOTES approach.
- Robotic SI Cholecystectomy in adult patients started to take off and shows great promise. Robotic SI would be beneficial in difficult SI laparoscopic cases like Nissen Fundoplications.
- Future SI Robotic surgery: flexible scope through the umbilicus with light, insufflation and multiple working channels.