



ORIGINAL RESEARCH PAPER

Paediatrics

SINGLE PORT LAPAROSCOPIC SURGERY WITH HAND GLOVE TECHNIQUE IN PAEDIATRIC AGE GROUP , A NEW ALTERNATIVE IN DEVELOPING COUNTRIES: - SERIES OF 40 PATIENTS

KEY WORDS: SILS in Paediatrics ; Hand Glove port technique in Paediatric

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ABSTRACT

Single incision laparoscopic surgery (SILS) has been widely used for most of the paediatric surgical procedure. It has few technical challenges as a defective triangulation while working through a single port, alteration in fulcrum effect ,clashing of external and internal instruments, narrowing of operating vision due to overlapping of instruments and management of pneumoperitoneum leakage. Herewith documenting experience with SILS in children using trans umbilical hand glove port with conventional rigid instruments and modifications to get better ergonomics during laparoscopy.

1. Introduction

In today's era of recent advances laparoscopic surgery is much conceptualised and revolutionized for numerous surgical conditions and has become significantly adventitious over open surgery. Minimal access surgery is adventitious in view of decreased postoperative pain, faster recovery and excellent cosmetic output. Operative time depends upon skills acquired by the surgeon. Today an era has come to evolve minimal access surgery to make it "scarless". In 1990s first step towards this was described by a group in Hong Kong by using only two ports for laparoscopic cholecystectomy (1) .

During later period, the concept of Natural orifice transluminal endoscopic surgery (NOTES) got evolved and single incision laparoscopic surgery originated as an option for conventional laparoscopic surgery.

Considering the risk of intra- abdominal contamination due to access to peritoneal cavity through normal viscera, umbilical scar is preferred as the portal of entry.

In minimal invasive surgery Ergonomic integration is an essential part to improve efficiency, safety and comfort for surgical team.

Single Incision Laparoscopic Surgery has few technical challenges as a defective triangulation while working through a single port, alteration in fulcrum effect ,clashing of external and internal instruments, narrowing of operating vision due to overlapping of instruments and management of pneumoperitoneum leakage (2) . Herewith documenting experience with SILS in children using trans umbilical hand glove port with conventional rigid instruments and modifications to get better ergonomics during laparoscopy.

Materials and Methods:

Herewith presenting prospective study of SILS procedures performed at various institutes for different age groups and for different procedures between 2015 to 2018. Materials used for making transumbilical port consist of a small flexible ring made up of infant feeding tube no 8/9 , one surgical hand glove , one metal ring and standard laparoscopic instrument set (Fig. 1) . Infra umbilical incision taken and hand glove port inserted by folding open end of hand glove over the ring made from Infant feeding tube 8 to make port stable in situ after insufflation (Fig. 2 & 3) . With the proper technique using conventional laparoscopic instruments equivalent results can be obtained as Classical SILS as described.

A total of 40 consecutive procedures had been done at different institutions: 15 girls and 25 boys with age ranged from 1 year to 14 years. We used SILS on 24 appendectomies. Average time was 45 minutes. We needed conversion to exploratory laparotomy in four cases (one case with

perforated appendix , one case with hard appendicular lump and two for difficulty to mobilise the appendix). Single-incision laparoscopic cholecystectomy was performed on 7 years old female child with symptomatic cholelithiasis. But required conventional conversion due to frozen calot's triangle. Mean operative time was 1 .5 hrs. Patients was discharged on postoperative day 5. 8 boys with non-palpable testis underwent with SILS. Age range was 1 year to 5 years. Mean operative-time was 1 hour 20 mins. Single staged orchidopexy was performed. One patient underwent bilateral orchidopexy. Patients were discharged on postoperative day 2. We performed 6 diagnostic intra abdominal lymph node biopsies in 4 female and 2 male babies presented with chronic intractable pain in abdomen without any other clinical signs and symptoms. Age was ranging from 5 years to 12 years. Patients were discharged on Post operative day 2. In 8 years female child presented with acute severe abdominal pain and diagnosed with ovarian torsion, SILS was performed and oophorectomy was performed. Patient was discharged on post operative day 5.

No postoperative complications were seen in all cases.



Fig.1 Material used : Hand Glove, 3 mm laparoscopic ports , One metal ring , Infant feeding tube no 8 , 3 mm conventional laparoscopic instruments.

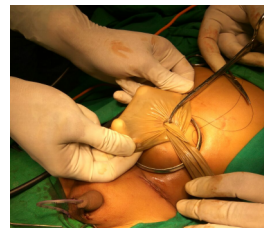


Fig 2 . Showing inner ring made up from Infant feeding tubes 8 to stabilise the port in situ.

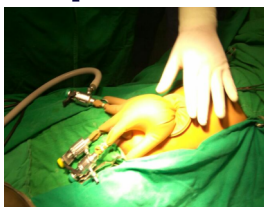


Fig 3. After insufflation of Hand glove port showing the stability of port.



Fig 4. End result of Single port laparoscopic orchidopexy surgery in 1 year old child.

Table 1 Outcomes of single port laparoscopic surgery using surgical glove port in Paediatric patients

Procedure	Number	Conversion to conventional surgery	Mean operative time (min)	Mean length of hospital stay (days)	Complication rate (%)
Appendectomy	24	4	45	2	0
Cholecystectomy	1	1	60	5	0
Undescended Testis	8	0	90	2	0
Intra abdominal lymph node biopsies	6	0	30	2	0
Oophorectomy	1	0	45	3	0

DISCUSSION :

In recent advances of laparoscopy, Single incision laparoscopic surgery (SILS) has been widely used for most of the paediatric surgical procedure. Literature has explained about many paediatric experiences about the feasibility and the safety of SILS in children for abdominal and urological procedures (3). The two major limitations for the use of classical SILS are the commercial multi channel single port devices are very costly with non availability easily and requirement of curved laparoscopic instruments set specially designed for SILS. The Hand Glove single port we used during our procedure is costing to approximately the 1/10th of the Classical SILS port. Also by providing increased mobility of hand tools, conventional laparoscopy instruments set can be utilised. Even though being the important thing required is needing of significant coordination between the surgeon and the camera holder as the conventional instruments are usually crossed at the access port into the abdominal cavity due to alteration in dynamics and fulcrum effects, it can be overcome with experience over period of time (4). Zani *et al.* reported that SILS seems to be associated with more postoperative pain than standard laparoscopy (5). But, a meta-analysis described by Saldaña and Targarona showed similar pain scores in both techniques (6). In our study we gave local anaesthesia block using drug Bupivacaine 0.5% w/v solution for injection in diluted form per kg dose as recommended. We found no pain at port site in postoperative period. Though on discharge orally paracetamol was prescribed as and when required. All patients were satisfied with the cosmetic results. According to our experience, SILS with hand glove technique in the paediatric population with conventional rigid instruments is feasible, safe and effective. But as mentioned it may require few technical experiences. It may be an alternative to the costly commercially available single-port systems especially in a developing country like India (7). To overcome with over riding of the instruments and obstructed vision due to altered fulcrum effect, we used 5 mm laparoscope keeping position just near to port after insertion without inserting more inside and 3 mm laparoscopic conventional instruments.

RESULTS :

A total 40 procedures been done at different institutions: 15 Girls and 25 Boys (Mean Age 7.5 years). SILS was used on many intra abdominal procedures in paediatrics with average operative time of 60 minutes. Average Hospital stay was near equal same as classical SILS procedures with same cosmetic results and postoperative follow up.

CONCLUSIONS :

SILS using hand glove and conventional rigid laparoscopic instruments is safe and may be a very cost effective alternative over commercially available single port systems in developing countries like India.

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