

Single Incision Laparoscopic Cholecystectomy (SILS)

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ABSTRACT

Objective: Single incision laparoscopic surgery is a rapidly emerging technique worldwide. The primary goal of the surgery is invisible scar. The objective of this study was to share our initial experience with the rest of world.

Methodology: From October 2009 to April 2010, single port surgery was offered to 30 patients of symptomatic gallstones. The data collected prospectively included age, sex, operative time, complications, pain and reason for conversion.

Results: Thirty SILS cholecystectomies were attempted and 27 were completed successfully. The mean operative time was 80 minutes (ranges 50-180min). Three patients needed further ports to complete the operation. All patients were discharged on 2nd postoperative day except one who had severe abdominal pain. This patient was discharged on 6th postoperative day. Two patients had mild umbilical wound infection, one patient was readmitted for pain management.

Conclusion: SILS cholecystectomy is a safe, feasible and without visible scar surgery in the hands of trained laparoscopic surgeons but needs more studies before it is recommended.

KEY WORDS: Single incision laparoscopic surgery, Single port surgery, Laparoscopic cholecystectomy.

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INTRODUCTION

Cholecystectomy, the procedure most commonly performed laparoscopically worldwide, has been recognized since 1992 for the removal of gall bladder. The well established advantages include better cosmetic results, less post operative pain and shorter recovery time than open cholecystectomy made world wide acceptance of the procedure.¹ In recent years, successful attempts to reduce the number of traditionally used four ports have been reported.

Reducing the number of ports has been shown to improve outcomes.²

Single incision cholecystectomy³ has been described by Piskun as early as 1999 with the insertion of two trocars through the umbilicus and additional sutures to stabilize the gall bladder. In addition number of recent reports of single incision surgery like donor nephrectomies, urological procedures, colorectal surgery, sleeve gastrectomies for morbid obesity and thoracoscopic procedures for evacuation of empyema were published.⁴⁻⁸

Single port or single incision laparoscopic surgery is an advancement in minimally invasive surgery. The potential for less pain, faster recovery, and improved cosmesis has been pushing the surgeons as well as patients to adopt this new technique.⁹

The primary disadvantage of single port surgery are the restricted degrees of freedom of movements, the number of ports that can be used, and the proximity of instruments to each other during the operation, all of which increase the complexity and technical challenges of the operation. To further overcome the technical challenges for SILS, differ-

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ent instruments that provide angulations and small profile trocars are being developed.¹⁰

In recent years natural orifice transluminal endoscopic surgery (NOTES) has been offered as the next generation of minimal invasive surgery with no scars.¹¹ However, serious drawbacks specially belonging to this technique such as access, safety of closure, infection, lack of appropriate instrumentation and difficulty in orientation have discouraged the use of NOTES procedure.¹² Because of inconvenience with NOTES, single incision laparoscopic surgery (SILS) has gained greater interest and popularity in the surgical community.¹

In this study we report our initial experience of cholecystectomy via SILS in a series of 30 patients.

METHODOLOGY

This study was conducted in surgical ward 03, Jinnah Postgraduate Medical Centre, Karachi, Pakistan from October 2009 to April 2010. Thirty patients of symptomatic gall stones were included in this study. Patients with acute attacks of cholecystitis were excluded. Patients were informed about the SILS technique and written consent was obtained.

A single intraumbilical 15mm incision was made and the umbilicus was pulled out exposing the fascia and peritoneum. After opening the peritoneum a SILS™ port (Covidien, USA) was introduced, pneumoperitoneum created with carbon dioxide. Three trocars introduced through the SILS port one for camera, second for articulating grasper to hold the neck of gall bladder and third for dissection.

After the fundus of the gall bladder was visualized a 2/0 Prolene suture on straight needle was introduced through the abdominal wall and passed through the fundus of gall bladder and passed back through abdominal wall. It was used to retract the gall bladder. After visualization of the hepatobiliary area an articulating grasper was placed on the infundibulum of the gall bladder which was articulated in the way that it moved away from the area of dissection. The second straight laparoscopic instrument was used to dissect the Calots triangle. After appropriate exposure of Calots triangle, the cystic duct and artery were separated, clipped and divided. The gall bladder was separated from the liver by hook electrocautery. Just before completion of liver dissection, hemostasis of liver bed was secured and the hepatobiliary area was irrigated with normal saline. The gall bladder was removed with single port device and sent for histopathology. Abdominal wall was closed with interrupted Vicryl 2/0 and umbilicus was sutured with Vicryl rapid 3/0.

RESULTS

Thirty patients (28 females and two males) were offered single port laparoscopic cholecystectomy. The average age of the patients was 37 years (range 27-60 years). The operative time from initial incision to closure of wound ranges from 50 minutes to 180 minutes (mean 80 minutes). Operative time was decreased considerably from 180 minutes to less than 60 minutes after the 10th SILS cholecystectomy and then remains stabilized between 50 – 75 minutes. Patient who was operated for Acute Cholecystitis with multiple adhesions took 180 minutes and it is the maximum time in this study.

Three patients needed further ports to remove gall bladder. The surgery for Acute Cholecystitis with multiple adhesions was converted into four port laparoscopic cholecystectomy. In 2nd patient in whom cystic artery bleeds because of slippage of liga clip an additional port was placed to secure haemostasis. The patient in whom the anatomy of Calot's triangle was not cleared two additional ports were placed to complete the procedure.

All patients were allowed orally within 24 hours and discharged second post operative day except for one patient she had severe abdominal pain but her vitals were normal. She had no fever, gut sounds were audible and was passing flatus and faeces. On second post operative day the abdominal ultrasound was advised which showed minimal collection of fluid in gall bladder fossa. Patient improved on fifth day and was discharged on sixth post operative day. Patients were followed for one month. During follow-up, two patients presented with umbilicus infection with no history of fever or any other signs of acute illness. They were managed with daily dressing. One patient was readmitted for pain control on the same day of discharge. The patient's workup was normal and pain was resolved by fifth postoperative day.

DISCUSSION

Single incision laparoscopic surgery is a well accepted and well recognized technique for intra abdominal and intrathoracic surgeries worldwide. The major difficulty with SILS systems for the surgeon to adapt the new method of instrumentation. The SILS technique is not a naturally ergonomic technique because the traditional laparoscopic principles of triangulation are lost and both the operating instruments and laparoscope are introduced through the same incision on the same axis. The real challenge of SILS is to avoid wording between the op-

erative instruments and camera to reduce operative stress. The movement of the surgeon must synchronize with the movement of camera assistant because every movement of one can interfere with the other.

In future, we hope these difficulties will be alleviated by the development of new instruments, which should be in line, thus avoiding the interference of light leads. Also, the length of the camera shaft should be long enough to allow the assistant to stand comfortably with his or her hands away from those of the operating surgeon.

Like any new technique the complication rate is higher initially for surgeons so that studies are conducted to know the exact outcome of the new technique. It is well known that early experiences with laparoscopic cholecystectomy are associated with higher rates of bile duct injuries.¹³ To date, the exact complication rate of SILS is not known and further studies are required to know the complication rate. The umbilical incision we make is a well known and standardized site of access to the abdominal cavity for laparoscopy. It does not add any complication. At the end of the procedure, a careful reconstruction of the umbilicus will restore its original position, thus achieving a completely invisible scar. There is no standard technique for trocar placement in SILS. But in this study we used Covidion TM port. The conversion rate of single port to four port is 10% in this study which is slightly less than Edwards C 11.25%.¹⁴

In this study the operative time is reduced gradually from 180 minutes to less than 60 minutes which is quite comparable to Tacchino, three hours for first SILS cholecystectomy to 50 minutes and more than Marchant AM which ranged from 45 to 90 minutes.^{1,10} The difference of time is dependant on skills of the surgeon. The mean operative time is 80 minutes which is quite comparable to Romanelli, 80.8 minutes and more than Edwards which was 69 minutes.^{9,14} The Operative time directly correlate with the status of gall bladder i.e. inflammation, adhesions, physique of the patient and expertise of the surgeon. Pain and umbilical wound infection are the major complications of SILS cholecystectomy in this study. Two (6.6%) patients had wound infection which is more than Merchant AM had no wound infection.¹⁰ The possible explanation of that, this study was conducted in a government hospital of a developing country where patients are poor and malnourished. In contrast to other authors pain is the major problem in this study like Merchant AM.¹⁰ We could not explain the reason of the pain and would recommend further studies to sort this problem out.

It is difficult to comment on the length of learning curve which is directly proportional to the experience of surgeon and his team, but in authors point of view 8-10 cases are good enough for trained laparoscopic surgeon, which is quite comparable to Erbella JJ.¹⁵

CONCLUSION

SILS cholecystectomy is safe and feasible, providing rapid recovery with no visible scar, although further studies are required to reach this conclusion before it can be widely recommended. SILS cholecystectomy should be performed by an experienced laparoscopic surgeon.

Authors Contribution:

ZM designed study, did data collection and manuscript writing.

AS and SR did review and final approval of the manuscript.

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