

# Laparoscopic Cholecystectomy With Straight Instruments Through One Incision: Learning From The Early Experience In Jamaica

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## Citation

S Cawich, M Albert, S Mohanty, G Dapri. *Laparoscopic Cholecystectomy With Straight Instruments Through One Incision: Learning From The Early Experience In Jamaica*. The Internet Journal of Surgery. 2012 Volume 28 Number 4.

## Abstract

There have been several reports that document the outcomes of conventional four port laparoscopic cholecystectomy in Jamaica. We report our experience with the first single incision laparoscopic cholecystectomy in Jamaica. We also perform a critical analysis of the experience with a view to developing a standardized procedure locally.

## INTRODUCTION

Since the first conventional four-port laparoscopic cholecystectomy (4PLC) was performed in Jamaica in 1993 [1], several reports have documented local experience with the technique [2-5]. The first recorded single-port laparoscopic cholecystectomy (SPLC) was performed in 1997 [6]. We analyze our experience after performing our first SPLC in Jamaica in March 2009.

## CASE REPORT

A 39-year-old woman presented with symptoms suggestive of biliary colic over 18 months. Ultrasonography confirmed cholelithiasis and a common bile duct diameter of 5mm. There was no clinical or biochemical evidence of choledocholithiasis. She was offered cholecystectomy using a laparoscopic approach.

She was prepared for anaesthesia and taken to the operating theatre electively. No antibiotic prophylaxis was administered. Hasson's technique was used to gain access to the peritoneal cavity under direct vision through a 2.5cm vertical umbilical incision. A SILS port® (Covidien, Inc., Norwalk, CT, USA) was inserted through the umbilical incision (Fig. 1) and used to create a 12mmHg pneumoperitoneum.

## Figure 1

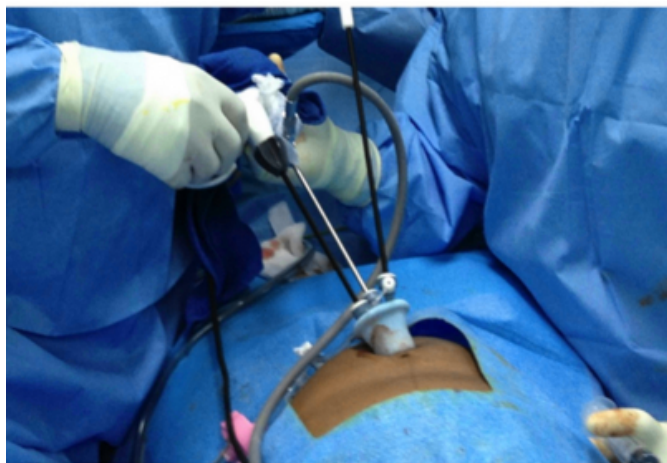
Figure 1. A SILS port® inserted through a 2.5cm vertical umbilical incision.



Once pneumoperitoneum was established, a standard 35cm 30°-laparoscope was introduced through the 10cm-port to establish vision. Thereafter, two straight laparoscopic instruments were introduced into the 5mm working ports (Fig. 2).

**Figure 2**

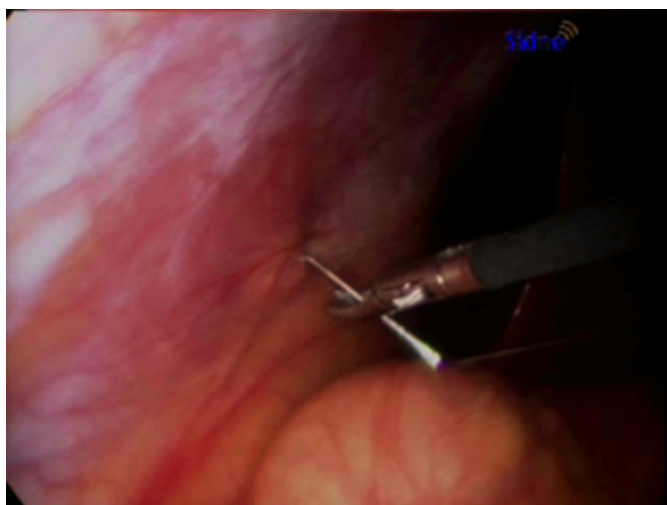
Figure 2. Standard-length straight laparoscopic instruments and a standard 35cm 30°-laparoscope introduced through the 5mm working channels of the SILS port.



A 5mm traumatic grasper (Stryker Endoscopy, California, USA) was used to manipulate the gallbladder infundibulum and Calot's triangle was dissected using a combination of electrocautery and a Maryland dissector (Stryker Endoscopy, CA, USA). We used a trans-abdominal 2/0 30" prolene suture on a 60mm straight needle (Ethicon Inc., West Somerville, NJ, USA) passed through the gallbladder to secure the fundus – thereby obviating the need for a separate port and retractor (Fig. 3).

**Figure 3**

Figure 3. The trans-abdominal prolene suture on a straight needle is passed through the gallbladder fundus, obviating the need for a separate port and retractor.



Using cautery dissection in a retrograde fashion, biliary structures were identified and Strasberg's critical view achieved. We used 5mm clips to ligate the cystic duct prior

to transection. The gallbladder was dissected from the liver bed using electrocautery. Once detached, the gallbladder was extracted from the abdomen through the fascial incision used to introduce the SILS port® (Figure 4).

**Figure 4**

Figure 4. Gallbladder being extracted from the single umbilical working incision.



Facial closure was then achieved with 1/0 Prolene sutures (Ethicon Inc., West Somerville, NJ, USA). The skin was closed with 4/0 monocryl sutures (Ethicon Inc., West Somerville, NJ, USA) as demonstrated in Figure 5.

**Figure 5**

Figure 5. Single skin incision post closure at the termination of cholecystectomy.



The operation lasted 65 minutes and was uncomplicated. This patient was discharged 5 hours post-procedure with oral analgesia and had an uneventful recovery post operation.

## **DISCUSSION**

It is now accepted that laparoscopic cholecystectomy is the gold-standard operation for benign gallbladder disease [7-11]. The reduction in surgical morbidity is a direct result of the minimally invasive nature of the technique.

Navarra et al. [6] started a surgical revolution when they described the first laparoscopic cholecystectomy through a single umbilical incision in 1997. The technique was slow to gain momentum but has been gaining popularity, largely due to the development of instrumentation specifically engineered for SPLC.

Currently, SPLC is an accepted alternative to conventional 4PLC. Besides the obvious aesthetic advantages, three prospective randomized trials have proven that SPLC brings significantly less post-operative pain than 4PLC, with similar safety profiles, duration of hospitalization and overall morbidity [12,14,15].

Apart from the SILS Port® (Covidien, Inc., Norwalk, CT, USA), we completed SPLC using regular laparoscopic instruments without complication. The experience has made us acutely aware of the technical challenges with SPLC.

Firstly, we had to adapt to a suboptimal view of the operating field, with the laparoscope parallel to working instruments. Specialized flexible tip laparoscopes would easily overcome this limitation but the cost was prohibitive in our setting. Nevertheless, we found that good communication and coordination allowed the cameraman to anticipate clashing and change the camera angle, moving the camera away from active instruments.

The second challenge was instrument crowding since all instruments were passed through a single access point. We found that triangulation was limited and there was considerable “sword fighting” using straight instruments. To compound this, there was additional technical difficulty due to restriction on the degrees of freedom of instrument movement when they were passed through a solitary entry point. For these reasons, we believe that surgeons who wish to perform SPLC should have advanced laparoscopic skills and experience with conventional 4PLC. This can be overcome by embarking on extra-corporeal training with simulators or animal labs [22].

Although there are several commercially available access ports, curved instruments and visual systems designed specifically for SPLC, they add a significant amount to the

overall cost of the operation. Therefore, their use was not feasible in our setting in Jamaica where the health care system is under-funded and only a fraction of the population have any form of health insurance [18-21].

Opponents have suggested that it is not well suited for the Caribbean setting due to the high cost to complete SPLC. This is understandable since it has been documented that 33% of patients in Jamaica choose an open approach to cholecystectomy because conventional 4PLC is unaffordable [5]. However, there are methods apart from using regular instrumentation that we could use for cost containment. In this case, we used a SILS port (Covidien, Inc., Norwalk, CT, USA), which attracts a cost of \$490.21 US locally [23]. We have considered abandoning the use of commercially available access ports in favor of the described technique where 3 low profile 5mm ports are placed in an umbilical incision [24,25].

It has also been reported that long waiting lists for 4PLC prompted 14% of patients undergoing cholecystectomies in Jamaica to choose the open approach [5]. The anticipated longer operating time for SPLC would make it even less available. This is an institutional limitation that is not limited to SPLC alone. However, this case was completed in our setting in 65 minutes. That compares well to published reports of 4PLC in Jamaica [2-5] where the average duration of operation ranges from 83 minutes [5] to 108 minutes [4].

## **CONCLUSIONS**

Despite operating in an underfunded environment, we can incorporate SPLC safely into our surgical armamentarium with minimal change to the existing hardware. To balance efficacy and safety, there should be careful case selection and a low threshold to convert to conventional 4PLC when necessary.

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