Single-incision laparoscopic cholecystectomy is a relatively new minimally invasive surgical technique in treatment of benign gallbladder diseases. It is considered a bridge technique between conventional laparoscopic cholecystectomy (LC) and NOTES. We are presenting our initial experiences in SILC (single-incision laparoscopic cholecystectomy). Seventeen patients underwent SILC (11 women and 6 men) with an average age of 43 years. Mean BMI score was 29.4 kg/m². The mean operative time was 93.5 minutes. There were conversions to conventional LC in two cases (11.6%). Average pain score measured on visual-analogue scale (VAS) 8h after the operation was 2.0. All patients expressed satisfaction with achieved cosmetic effect. We conclude that SILC is safe and feasible procedure, with excellent cosmetic effect, but further prospective studies are required before SILC can be generally accepted.

Key words: SILC, laparoscopic cholecystectomy, benign gallbladder diseases

INTRODUCTION

Single-incision laparoscopic cholecystectomy is a relatively new minimally invasive surgical technique in treatment of benign gallbladder diseases. It is considered a bridge technique between conventional laparoscopic cholecystectomy (LC) and NOTES (natural-orifice transmural endoscopic surgery). Development of minimally invasive surgical concept allows us to perform complicated surgical interventions with minimum amount of trauma and better cosmetic effect. With perfection of ports and instruments, as well as surgical technique itself, new, more demanding tasks are set before surgeons. SILC is essentially a laparoscopic technique, so experienced surgeons can adapt faster and efficient; there is no influence on hollow organs integrity (as in NOTES); cosmetic effect is greatly improved; there is a lesser percentage of wound infections; faster recovery and return to daily duties can be achieved, and at last, it allows conversion to conventional LC very easily. We are presenting our initial experiences in performing SILC.

MATERIAL AND METHODS

From August 2010. to November 2011., 17 patients underwent SILC on First department, Clinic for digestive surgery of Clinical center of Serbia. Data on gender, operative time, postoperative pain, subhepatic collection, nausea and vomiting, cosmetic effect and general satisfaction of patients were prospectively collected. Follow-up was concluded one month after surgical intervention. Selection of patients was based on physical examination, abdominal ultrasound results and laboratory analysis. Exclusion criteria were acute cholecystitis, severe obesity, previous operations in upper abdomen, liver cirrhosis, pregnancy and patients on anticoagulation medications.

RESULTS

We have performed SILC on our first three patients using improvised glove multichannel port and conventional laparoscopic instruments, 10mm camera with two 5mm working ports and 5mm clip applicator, but we had constant leakage of gas and it was not possible to maintain proper intraabdominal pressure. Livragi at al. reported very good results with glove technique in a study which included 34 patients. With remaining 14 patients we have used various multichannel ports: SILS Port, Covidien; TriPort, Advanced Surgical Concepts; OctoPort V2, DalimSurgnet; and X-cone, Karl Storz. (Fig 1,2) Operative technique in SILC is not standardized and it depends on technical characteristics of ports themselves, available instruments and individual surgical approach. Patients were positioned in reverse Trendelenburg position, and the operating table was slightly rotated to the left. Both
the surgeon and assistant were on the left side of the patient. The main idea in SILC is hiding the postoperative scar in umbilical fold, and basically obtain a scarless result. We made a horizontal intraumbilical 20-25mm incision, after which the abdominal cavity was entered with the open method. After that the multichannel port was placed. Further course of the operation depended primarily on specific characteristics of ports. All ports have three channels, except for the X-cone port, which has four channels. (Figure 3) In case of X-cone port, there was no need for transfixing sutures for gallbladder retraction, but simultaneously, collision of larger number of instruments made the operation very uncomfortable. 10mm and 5mm endoscopic camera was used, and the instruments were both conventional and curved, depending on the availability. We placed transfixing sutures in 7 patients for gallbladder retraction. The gallbladder was extracted with or without an endoscopic retrieval bag.

A total of 17 patients were operated (11 women, 6 men), with average age of 43 years. They were all diagnosed with benign gallbladder disease, chronic calculosis (n=13), and gallbladder polyps (n=4). The mean operative time was 93.5 min (47-140 min). Preoperative prophylactic antibiotic protection with third-generation cephalosporin was administered to all patients. Conversion to conventional laparoscopic cholecystectomy was necessary in two cases. In first case, there was a rupture of protective membrane of the port, and therefore a serious gas leakage. In second case, it was not possible to obtain good visualization of Calot triangle. Therefore, two 5mm working ports were placed after which the procedure was successfully finished in both cases. Postoperative pain score measured on VAS was 2.00 (after 8h), and 1.58 (after 24h). An abdominal ultrasound was performed prior to discharge. There was no evidence of subhepatic fluid collection in any patient. Five patient complained on postoperative nausea which was successfully treated with proton pump inhibitors and antiemetics. All patients were discharged on first postoperative day. They were all satisfied with cosmetic effect. (Figure 4) Ten patients were extremely satisfied with overall outcome, six were satisfied, while one patient was unsatisfied because of nausea.

**DISCUSSION**

Single-incision laparoscopic cholecystectomy is the next step in minimal invasive surgery. The main benefits of SILC are better cosmetic effect (virtualy scarless procedure) and lower postoperative pain. The terminology for this new procedure has not yet been standardized. Proposed names for single site surgery include SILS, SPA (single port access), LESS (laparo-endoscopic single site surgery), TUES (transumbilical endoscopic surgery) etc. (Table 1) We have chosen SILC, as we find it most accurate description. Hopefully, the consensus regarding terminology will be reached in the near future. Disadvantages of SILC include both intra- and extraabdominal collision of instruments; the loss of triangulation; lower visibility of Calot triangle; the technique demands more time and patience and expensive instruments and ports. In two cases we were forced to convert to conventional LC; in first case due to technical issues; in second because of inadequate visualization of cystic artery and duct. Ji et al. reported 5% conversion rates due to uncontrollable bleeding, while Wong et al. had to place additional ports in 10% of cases due to inadequate visualization. The mean operative time is prolonged because of specific technical characteristics, but we had no other complications. A study that included 285 patients reported 15% longer mean operative time and 66% shorter hospital stay in comparison with conventional LC, as well as no statistical difference in pain score, amount of administered analgetics or complications within first month after the surgery. Another study that included 108 patients did not found any statistical difference between the two methods in terms of complications, pain score or hospital stay. Postoperative pain is significantly reduced with the intro-
duction of laparoscopic cholecystectomy. Development of new minimally invasive surgical procedures, such as SILC, aim at lowering pain score even more. Prasad et al. compared postoperative pain after conventional LC and SILC, and they haven’t found any statistical difference in pain scores 8h after the procedures.8

CONCLUSION

Based on our initial experiences, we conclude that SILC is safe and feasible procedure, with excellent cosmetic effect, but for confirmation of safety and feasibility, as well as standardization of this surgical technique, further prospective studies are needed. It is important to mention that SILC could be safe in hands of well trained and experienced laparoscopic surgeons, with short learning curve, but at this point of time, selection of patients and adopting strict criteria for SILCare neccessary.

SUMMARY

SINGLE-INCISION LAPAROSKOPSKA HOLECISTEK-TOMIJA - INICIJALNA ISKUSTVA SA RAZLIČITIM VIŠEKANALNIM PORTOVIMA

Single-incision laparoscopic holecistektomija (SILC) predstavlja relativno novu minimalno invazivnu hiruršku tehniku u lečenju benignih oboljenja žučne kese. Smatra se prelaznom metodom između konvencionalne laparoskopske holecistektomije i NOTES-a. U ovom radu predstavljamo naša inicijalna iskustva u SILC-u. Operisali smo 17 pacijenata, od toga 11 žena i 6 muškaraca, prosečne starosti 43 godine. Prosečan BMI je iznosio 29,4 kg/m2. Prosečno trajanje operacije je iznosilo 93,5 min. U dva slučaja je bilo neophodno prevodjenje u konvencionalnu laparoskopsku holecistektomiju (11,6%). Prosečan skor bola osam sati nakon intervencije meren na VAS skali je iznosio 2,00. Svi pacijenti su izrazili zadovoljstvo postignutim kozmetskim efektom. Zaključili smo da je SILC sigurna i izvodljiva hirurška procedura, sa odličnim kozmetskim efekatom, ali su za potvrdu sigurnosti i izvodljivosti, kao i standardizaciju hirurške tehnike, neophodne prospektivne kliničke studije na većoj seriji bolesnika pre nego što ona bude opšte prihvaćena.

Ključne reči: SILC, laparoskopska holecistektomija, benigna oboljenja žučne kese

BIBLIOGRAPHY


