

Single-incision versus 3-port laparoscopic cholecystectomy in symptomatic gallstones: A prospective randomized study

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Background. Laparoscopic cholecystectomy is the standard treatment for symptomatic gallbladder disease. Single-incision laparoscopic surgery was developed with the aim of decreasing the invasiveness of conventional laparoscopy. The aim of this study was to compare the clinical outcome of single-incision laparoscopic cholecystectomy with 3-port laparoscopic cholecystectomy.

Methods. From February 2014 to September 2016, 187 patients with symptomatic cholelithiasis were randomized to a single-incision laparoscopic cholecystectomy group (89 patients) or a 3-port laparoscopic cholecystectomy group (98 patients). The primary outcomes were a postoperative pain score (at 6 hours and 1 day) and patients of complications, while the secondary outcomes were operative time, estimated blood loss, opioid requirements, duration of hospital stay, and patient satisfaction with aesthetic effects.

Results. When comparing 3-port laparoscopic cholecystectomy and single-incision laparoscopic cholecystectomy, there were differences in the (mean \pm standard deviation) operative time (58.9 ± 18.6 minutes vs 45.2 ± 11.8 minutes; $P < .001$), success rate (93% vs 99%; $P < .01$), conversion rate (7% vs 1%; $P < .001$), and aesthetic score (7.9 ± 1.6 vs 6.7 ± 1.4 ; $P = .008$). There were no statistically significant differences in estimated blood loss, postoperative pain, opioid requirement, complications, and hospital stay between both groups.

Conclusion. Single-incision laparoscopic cholecystectomy is a safe and feasible procedure in selected patients. The main advantage is the superior aesthetic results, while the main disadvantage is a greater operative time with some technical difficulties. (Surgery 2017;■:■-■.)

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LAPAROSCOPIC CHOLECYSTECTOMY (LC) is the standard treatment for symptomatic gallbladder disease.¹ The technique of LC continues to develop toward less invasiveness by decreasing the number of traditionally used 4 ports resulting in the development of safer and feasible 3-port² and 2-port LC.³ Single-incision laparoscopic cholecystectomy (SILC) appeared as a new method in 1997.⁴ With SILC,

multiple instruments are used either through a single-port device with multiple channels or through multiple, closely placed ports.⁵

The suggested advantages of SILC include less ports, less postoperative pain and narcotic requirements, a better aesthetic result, and quicker return to normal activity.^{6,7} Hence, use of the SILC technique is rapidly growing among surgeons and patients, and in many practices, SILC has become an alternative technique to traditional multiport LC.

In contrast, the disadvantages include a more difficult technique, greater operative time, greater cost, and possibly increased morbidity.^{8,9} At the time of this study, there were no available prospective, randomized, controlled trials in the literature sufficient for a fair comparison between SILC and multiport LC. Therefore, we prepared this study to compare SILC and 3-port LC (TPLC) prospectively.

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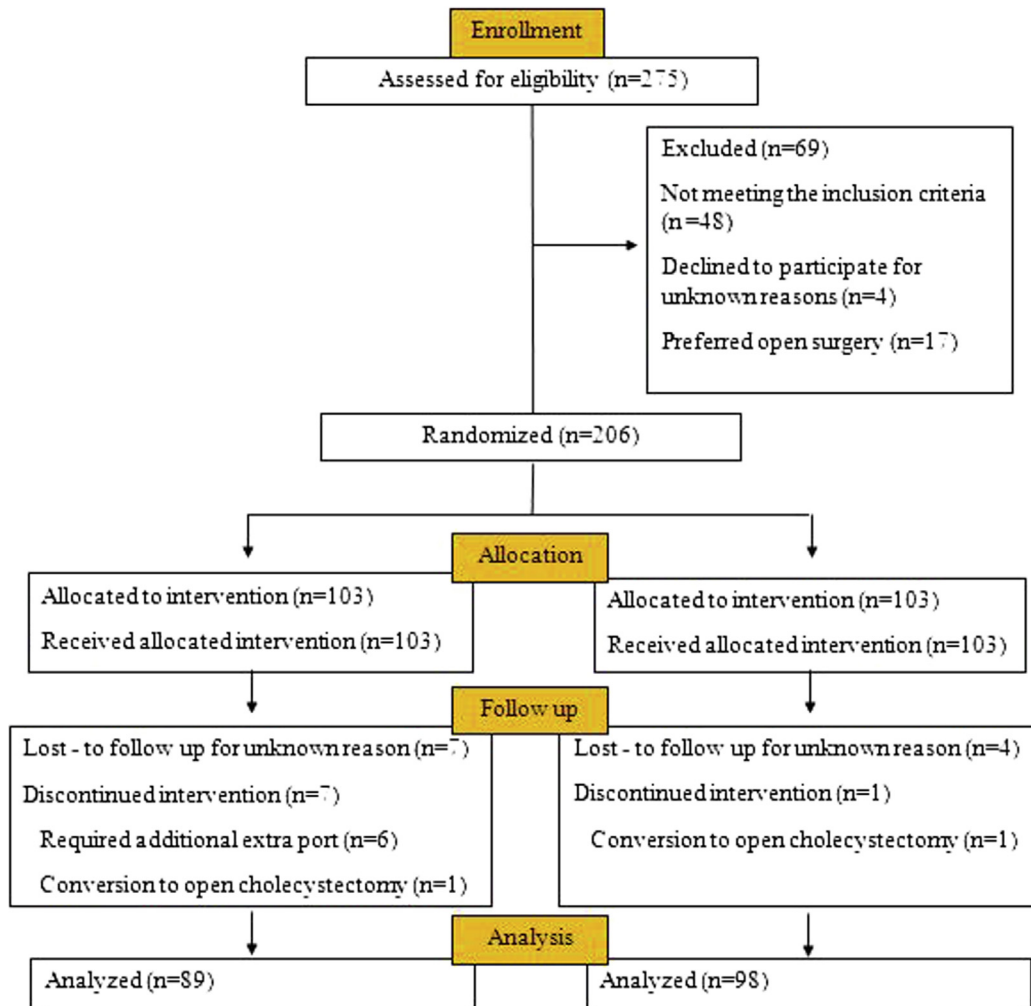


Fig 1. Consort flow diagram of patients.

PATIENTS AND METHODS

From February 2014 to September 2016, patients with symptomatic cholecystolithiasis at 2 university hospitals were enrolled in this study. The inclusion criteria were patients with a preoperative diagnosis of symptomatic gallstones aged from 20 to 60 years, American Society of Anesthesiologists (ASA) grade I, II, or III, and agreement to complete the study requirement. Exclusion criteria were patients with any contraindication to laparoscopy, suspected Mirizzi syndrome, choledocholithiasis, malignancy, previous upper abdominal surgery, previous mesh repair of an umbilical hernia, long-term anticoagulant treatment, pregnancy and a stone(s) >2 cm in preoperative ultrasonography.

The number of patients needed was calculated. Considering a power of 80% and reliability of 0.05,

we found that 76 patients should be present in each group. The study was started with a target of 275 patients for the possible loss of patients and data during the study. Eligible patients (206 patients) were randomly divided into 2 equal groups (Group 1: SILC, Group 2: TPLC) according to computer-generated random numbers. Of the 103 patients allocated to intervention in each group, 14 patients were excluded from the SILC group and 5 patients from the TPLC group, and the remaining 89 and 98 patients in the SILC and TPLC groups, respectively, were included in the study (Fig 1).

Routine investigations and the evaluation of operative fitness were done in all cases. Patient demographics, body mass index (BMI), ASA score, indication for cholecystectomy, operative time, estimated blood loss, success and conversion rate,

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