

SINGLE INCISION LAPAROSCOPIC CHOLECYSTECTOMY – ADVANCING TOWARDS SCARLESS SURGERY

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Abstract

Single incision laparoscopic cholecystectomy was introduced as an attempt to reduce the pain, scarring and the recovery time in patients undergoing gallbladder surgery, but questions are still raised regarding the safety of the procedure, real benefits and the advantages over the multiport conventional approach.

Multiple articles regarding single incision laparoscopic cholecystectomy have been published, including retrospective cohort studies, but also some meta-analyses of randomized controlled trials comparing the procedure with the traditional laparoscopic approach have been performed.

Key words: SILC, CLC (conventional laparoscopic cholecystectomy), meta-analyses.

INTRODUCTION

Erich Muhe performed the first laparoscopic cholecystectomy on 12 September 1985, highly motivated by Semm's laparoscopic appendectomy. At first, the surgical community was skeptical, not yet prepared for the new concept of minimally invasive surgery. Since then, laparoscopic surgery had evolved tremendously, in a continuous quest for other approaches even less invasive, in order to minimize the patient's sufferance (Litynski GS, 1998, Reynolds W, 2001).

Single incision laparoscopic cholecystectomy was first presented as an alternative to the standard laparoscopic cholecystectomy by Navarra, in 1997, in a letter to the editor in the British Journal of Surgery (Navarra G. et al, 1997).

Conventionally, four ports are used in order to perform laparoscopic cholecystectomy. Since every incision and every trocar placement comes with a risk, the goal is to reduce the number and size of incisions and ports, thus minimizing the surgical trauma.

Single incision laparoscopic surgery implies the introduction of the laparoscopic equipments and the instruments through a unique access way, represented by the umbilicus. The advent of new instruments (bent, articulated, curved), the improvement of laparoscopic equipment and development of special devices makes the procedure advance real fast.

MATERIAL AND METHOD

The work represents a synthesis of the most important meta-analyses and systematic reviews performed so far, that compared single incision laparoscopic cholecystectomy (SILC) with conventional laparoscopic cholecystectomy (CLC) (table 1).

Table 1

Meta-analyses of randomized controlled trials that compare SILC with CLC

Meta-analysis	Year	Number of studies included	Number of patients included
<i>Hua et al.</i>	2014	43	4572
<i>Milas et al.</i>	2014	30	2411
<i>Geng et al.</i>	2013	25	1841
<i>Trastulli et al.</i>	2013	13	923
<i>Zehetner et al.</i>	2013	9	695
<i>Arrezo et al.</i>	2013	12	996
<i>Wu et al.</i>	2013	9	755
<i>Zhang et al.</i>	2013	11	859
<i>Pisanu et al.</i>	2012	12	892
<i>Hao et al.</i>	2012	15	1113
<i>Sajid et al.</i>	2012	11	858
<i>Markar et al.</i>	2012	7	375
<i>Garg et al.</i>	2012	9	659
<i>Zhong et al.</i>	2012	7	611
<i>Wang et al.</i>	2012	5	264

RESULTS AND DISCUSSIONS

Cosmetic score and postoperative pain

The obvious advantage of SILC over CLC is that the procedure needs only one incision. Geng and his colleagues performed a meta-analysis that included 25 randomized controlled trials from 2128 published articles; 1841 patients were operated, 944 with the SILC technique and 897 underwent conventional laparoscopic cholecystectomy. They found that SILC is associated with a better cosmetic outcome and lower postoperative pain in the first 12 hours after surgery (Geng L. et al, 2013).

The largest meta-analysis, that comprised 43 studies, with 2291 patients randomized to SILC and 2281 to CLC, showed significantly reduced postoperative pain on day 0, lower rate of analgesic use, better cosmetic score (Hua J. et al, 2014). One review also reported better outcomes in patients that underwent SILS cholecystectomy when related to the cosmetic results, measured with the Body Image Scale questionnaire and the cosmesis score (Trastulli et al, 2013).

Cosmesis and pain scores (at 24 hours after surgery) were superior in the SILC group in patients with uncomplicated disease in three other meta-analyses (Hao L. et al, 2012, Zehetner et al, 2013, Arrezo A. et al, 2013), but other results showed that both techniques were statistically comparable as far as postoperative pain and cosmesis score are concerned (Sajid et al, 2012, Markar SR. et al, 2012).

In one meta-analysis, SILC was superior in terms of the cosmetic outcome, with higher cosmetic satisfaction on day 30 after surgery, but no significant differences in postoperative pain scores were noticed (Wu XS. et al, 2013).

Garg et al analysed nine randomized controlled trials that included 659 cases, 349 operated with the SILC technique and 310 with the standard laparoscopic procedure. SILC was associated with a better cosmetic score, but no advantages were observed in terms of postoperative pain (at 6 and 24 h) (Garg P. et al, 2012).

One meta-analysis reported a modest early cosmetic superiority with SILC (Milas M. et al, 2014).

Operative time

The operative time was significantly longer in the single incision group in most meta-analysis, but the authors observed that it decreased once experience was gained by the surgeon, with no difference between the two techniques after the first ten cases (Geng L. et al, 2013). They also stated that the learning curve should be taken into consideration when outcomes are presented. Also, the operative time may be influenced by some patient characteristics as acute cholecystitis, previous abdominal surgery or severe

obesity (Geng L. et al, 2013). In one review, operative time was longer in the SILC group, but in ten of the trials included, it improved significantly once the experience came (Milas M. et al, 2014). In one meta-analysis, that included seven high quality trials, with 611 patients, operative times were similar in both groups (Zhong X. et al 2012).

Complications

One meta-analysis reported similar postoperative complications rates (16% in the SILC group, respectively 12% in the CLC group) (Zehetner J. et al, 2013). Other meta-analyses showed that both techniques were statistically comparable as far as postoperative complications were concerned (Geng L. et al, 2013, Hua J. et al, 2014, Pisanu A. et al, 2012, Sajid MS. et al, 2012, Trastulli S. et al, 2013, Markar SR. et al, 2012). The risk of incisional hernia was very rare, but significantly higher in patients that underwent single incision cholecystectomy in one review (Milas M. et al, 2014).

Length of Hospital Stay

Short hospitalization means lower costs, which is obviously an advantage, both to the patient and the hospital.

One meta-analysis reported shorter length of hospital stay in patients operated with the SILC technique (Hua J. et al, 2014). Other meta-analyses showed no significant differences in the duration of hospitalization (Geng L. et al, 2013, Trastulli S. et al 2013, Zehetner J. et al, 2013, Wu et al 2013, Garg P. et al (2012). Statistically comparable outcomes were found by Sajid et al in their review, that included 858 patients.

A meta-analysis of randomized controlled trials, but also nonrandomized studies that compared the two procedure revealed shorter hospitalization in the SILC group (Qiu et al, 2013).

Conversion rate, estimated blood loss, were similar in both groups in all the meta-analyses, except for one (Qiu et al, 2013), that reported higher conversion rate with SILC. Also, single incision approach required additional port more than CLC (Sajid MS. et al, 2012).

CONCLUSIONS

Single incision laparoscopic cholecystectomy was associated with better cosmetic results and less postoperative pain in most meta-analyses. The operative time was longer, but this is not conclusive, since it decreased significantly along with the surgeon's experience. The procedure appeared to be safe and feasible, but whether the outcomes are superior or similar to the traditional technique, remains to be further investigated.

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