SINGLE-INCISION LAPAROSCOPIC CHOLECYSTECTOMY – CAN WE AFFORD THAT? COST COMPARISON OF DIFFERENT SURGICAL TECHNIQUES

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One of the most commonly performed surgeries in general surgery wards with laparoscopic technique as a method of choice is gall-bladder excision. In addition to the commonly used conventional laparoscopic cholecystectomy single incision laparoscopic cholecystectomy is getting more and more attention. Despite many works and studies comparing these methods, there is still a shortage of results assessing efficiency of this new surgical technique. The aim of the study was to evaluate cost-effectiveness of this method in Polish financial reality. We have analyzed costs of three different surgical techniques: conventional (multi-incision) laparoscopic cholecystectomy, SILC and ‘no-port’ SILC.

Material and methods. We conducted a retrospective study that compared three groups of patients who underwent treatment with conventional laparoscopic cholecystectomy (n=20), SILC (n=20) and no-port SILC (n=20). These groups were matched by age, sex and BMI. Following parameters were analyzed: complication rate, operative time, operative costs, length of hospital stay, hospitalization costs. The SILC cases were performed with one of the three-trocar SILC ports available on the market. The ‘no-port’ SILC cases were performed by single skin incision in the umbilicus, insertion of one 10 mm trocar for the operating instrument, another instrument and scope were inserted directly through small incisions in the aponeurosis without a dedicated port.

Results. The average operative cost was significantly higher in the SILC group comparing to the conventional laparoscopy group and the no-port SILC group. There was no significant difference in complication rate, operative time, length of hospital stay, or hospitalization costs between the three groups.

Conclusions. Currently the cost of the dedicated SILC port does not allow a regular use of this procedure in Polish financial reality. According to our experience improved cosmesis is the only advantage of the single incision laparoscopy, therefore we believe that it is reasonable to consider this technique in a very selected group of patients.

Key words: laparoscopy, single access technique, SILC, cost effectiveness

Undisputed development in the field of surgery is the introduction and popularization of minimally invasive surgery techniques. More and more often laparoscopic procedures are used as standard treatment for abdominal organ diseases. The wide range of surgeries performed using laparoscopic method and strengthening their position in everyday general surgeon practice encourage to take a next step to further minimazation perioperative trauma, reducing length of hospital stay or improving cosmesis. An example of technique that tries to find its place is single incision laparoscopy allowing to use one port for inserting camera for viewing the peritoneal cavity and instruments necessary to perform surgery. Every year there are new reports of various laparoscopic procedures performed safely using single incision techniques. They include cholecystectomy, appendectomy, adrenalectomy...
tomy, splenectomy, colon resection, inguinal hernia surgery, or procedures from the field of bariatric surgery (1-12). Trend of development of minimally invasive surgery can be also observed in Poland with publishing papers concerning technically advanced procedures using single incision, as well as Natural Orifice Translumenal Endoscopic Surgery (NOTES) (13-17). Gall-bladder excision is one of the most commonly performed surgeries in general surgery wards with laparoscopic technique as a method of choice.

The purpose of our paper was to evaluate cost-effectiveness of this method in Polish financial reality.

MATERIAL AND METHODS

The study involved 60 patients operated at 2nd Department of General Surgery of the Jagiellonian University Medical College for symptomatic cholelithiasis in period from 15 October 2009 to 31 December 2012. Patients were divided into three groups based on applied surgical technique. The first group consisted of 20 patients who underwent treatment with conventional laparoscopic cholecystectomy (MILC – Multi Incision Laparoscopic Cholecystectomy) (20 female patients, average age 30.56 ± 3.74, average BMI 21.34). The second group consisted of patients who underwent treatment with SILC (20 female patients, average age 30.26 ± 6.24, average BMI 21.84). The last group included patients who underwent treatment with no-port SILC (20 female patients, average age 35.75 ± 4.1, average BMI 20.69). These groups were matched by age, sex and BMI. Retrospective analysis of following parameters was carried out: average operative time, operative costs, length of hospital stay and hospitalization costs. Operative costs were calculated by analysing material consumption based on reports compiled by surgical nurses. Costs of patient stay in ward, costs of drug consumption were the same for all studied groups, therefore they were not considered in comparison cost differences between analysed groups. Frequency and reason behind changing surgical technique were also determined.

The change was for conventional laparoscopy – conversion to open surgery, for single incision techniques – conversion to classical laparoscopy by application of additional ports. SILC procedures were carried out using Covidien SILS Port. The surgeries performed with no-port SILC were carried out by direct transabdominal insertion of laparoscope and surgical instruments. Single incision in the navel, followed by three fascial incisions, through which operating instrument, supporting instrument and laparoscope were inserted directly (without use of trocars).

RESULTS

Average length of hospital stay after cholecystectomy was the same for all groups, equal to 2 days. Average operative time for different groups was respectively I 63.75 minutes, II 65 minutes, III 62.50 minutes. The differences in operative time for different groups were not statistically significant, and therefore costs of using operating theatre, anaesthesia, including drugs used for general anaesthesia were the same for all groups. The differences in costs of hospital stay for different patient groups were not statistically significant and had no impact on total hospitalization costs.

Average costs of consumables required for performing surgery were following for different groups: I: 848.95 PLN, II 2479.54 PLN, III 821.45 PLN (fig. 1).

In our studies, only in one case, for 40 y.o. female patient is was necessary to change no-port SILC surgery to classical laparoscopy due to the difficult intraoperative conditions preventing correct identification of anatomical structures resulting from inflammatory infiltration around the neck of gall-bladder. For any other groups in analysed period it was not necessary to change operation technique to open surgery. No complications during surgery or in postoperative period were observed for any of the groups.

DISCUSSION

Interest in “no scar” surgeries is not fading. Only this year, several dozen of new papers have appeared, mainly concerning single incision procedures. They find applications also in other surgical fields than general surgery, such as urology (nephrectomy, prostate operations),
Single-incision laparoscopic cholecystectomy – can we afford that?

Fig. 1. Average cost of materials used during the procedure

![Cost of materials](image)

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**CONCLUSIONS**

1. With current valuation of medical procedures, the cost of surgery performed with SILC with use of dedicated port greatly exceeds cost of conventional laparoscopic cholecystectomy, what makes it unprofitable in Polish financial reality.
2. Cholecystectomy with use of single incision in the navel will be applied only in selected group of patients, for whom cosmetic effect is especially important.
3. For use in everyday practice another solution shall be considered: no-port single incision cholecystectomy, which cost is similar to conventional method, while cosmesis is better.

**REFERENCES**