



COMPARATIVE ANALYSIS OF TRAUMA REDUCTION TECHNIQUES IN LAPAROSCOPIC CHOLECYSTECTOMY

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ABSTRACT

Nowadays, there is no operation in the field of abdominal surgery, which cannot be performed laparoscopically. Both surgeons and patients have at their disposal an increasing number of laparoscopic techniques to perform the surgical interventions.

The prevalence of laparoscopic cholecystectomy is due to its undeniable advantages over the traditional open surgery, namely small invasiveness, reducing the frequency and severity of perioperative complications, the incomparably better cosmetic result, and the so much better medical and social, and medical and economic efficiency.

Single-port laparoscopic techniques to perform laparoscopic cholecystectomy are acceptable alternative to the classical conventional multi-port techniques.

The security of the laparoscopic cholecystectomy requires precise identification of anatomical structures and precise observing the diagnostic and treatment protocols, and criteria for selection of patients to be treated surgically by these methods.

Keywords: Socially significant diseases; abdominal surgery; working ability; gallstone disease

INTRODUCTION

The rapid development of laparoscopic techniques after their introduction into surgical practice in the late 80s and early 90s of the 20th century led to a conceptual revolution in surgery. [1]

The initial mistrust and skepticism accompanying each new venture, quickly gave way to enthusiasm when the new prospects before surgery were realized.

As one of the most common present-day diseases, the gallstone disease has a great medical and social significance. It is determined not only by the frequency, but also by the risks of complications, limitations in working capacity and daily activity, which affects the quality of life of people suffering this pathology. [2, 3]

PURPOSE

The purpose of this study is to compare the surgical techniques for cholecystectomy and to analyze the ad-

vantages and disadvantages of the compared techniques by references data.

On order to achieve this objective, a comparison of intra- and perioperative results in the application of various techniques of conventional laparoscopic cholecystectomy and single-port laparoscopic techniques was made.

RESULTS AND DISCUSSION

1. Current status

A driving force in development of the modern minimal invasive surgery is the rapid technological progress over the last decade. It is expressed in two major trends:

- ongoing constructive technological development of the existing instrumentarium and creation of new instrumentarium of high ergonomics and safety levels;
- quantum leap of the standards for visualization of surgical interventions (3D visualization, stereo laparoscopy).

Gallstone disease is one of the most common present-day diseases. According to the World Health Organization (WHO), about 10% of the world population suffered this pathology in 2013.

Current trend in surgical treatment of gallstone disease is aimed at improving and evolutionary upgrade of the classic multi-port techniques for performing laparoscopic cholecystectomy, already established as classic ones.

In the mid-90s of the last century, after accumulating sufficient clinical experience in conventional techniques for performing surgical interventions, a new trend in laparoscopic surgery was formed- Reduced Port Laparoscopic Surgery (RPLC). This evolutionary trend gave birth to others techniques like LESS (Laparo-endoscopic single-site surgery), SSLS (Single-site laparoscopic surgery), SPLS (Single-port laparoscopic surgery), as well as various hybrid techniques for performing laparoscopic surgery, which concept is the synergy between the proven benefits of the laparoscopic classic surgery and technological innovation of the new trends. [4, 5, 6, 7, 8]

Recently, development of multi-channel instruments port devices allows entry into the abdominal cavity through one orifice (single port). [9] Reducing the

number of ports to a single one looks attractive because of the opportunity to reduce the complications associated with the surgical trauma, reduce the postoperative pain and improve the cosmetic results. The potential benefits of SILS (Single-incision laparoscopic surgery) versus the conventional laparoscopic cholecystectomy include less pain from the incision, less postoperative needs of painkillers, shorter hospital stay, faster return to work and restoring the normal activity, better cosmetic effect, rarer wound complications, and significantly higher patient satisfaction. [10, 11, 12]

The single-incision laparoscopic surgery techniques (SILS) to perform laparoscopic cholecystectomy represent a modification of the traditional surgical techniques established in the laparoscopic surgery and acquired the gold standard statute. Like all new methods, SILS has a long way to go from single observations to large multicenter randomized clinical trials. [13] At present, there are many scientific developments that study and compare the advantages of SILS techniques for laparoscopic cholecystectomy with the traditional ones - such as reducing the postoperative pain and better cosmetic result. [14]

The indications, contraindications and preoperative preparation to perform surgical intervention through a single laparoscopic port have certain limiting criteria in the selection of operating techniques. Such criteria are the absence of icteric episodes in patient history, or suspicions of choledocholithiasis in the preoperative imaging studies, BMI>30, absence of previous surgeries in epigastrium and mesogastrium. Most authors who report large series of patients participating in clinical trials that are various by design, duration and location, report similar limiting criteria. The aim of giving a top priority to the patient safety in establishing of any new surgical procedure is highly justified. As an evolutionary stage in the development of minimally invasive surgery, the SILS surgeries are grounded on the classical principles and ideas of the multi-port laparoscopic techniques. [15]

As a concept, SILS repeat in a sense the stages of development and approval of the classic multi-port laparoscopic cholecystectomy, and face similar challenges. [16]

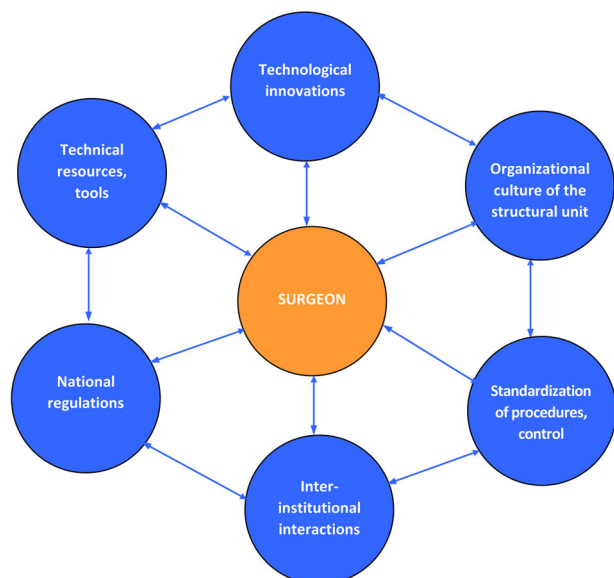
The indications, contraindications and preoperative preparation for SILS laparoscopic cholecystectomy are the same as with the conventional multi-port laparoscopic techniques (Level III, Grade A). Access to the abdominal cavity and placing the trocars, or ports follow the algorithm and safety standards of endoscopic access (Level III, Grade A). Introducing into practice of new instruments and access devices (ports) should be done in accordance with the established safety protocols and safety consensus in performing laparoscopic cholecystectomy (Level III, Grade A). During the initial accumulation of experience and in case of intraoperative difficulties, placing additional port is not considered as an error, or a factor that affects the surgical procedure (Level III, Grade A). [17, 18, 19]

2. Future directions of the scientific research and development trends

Single-port laparoscopic surgery is a modification of the traditional and well-established techniques for performing surgical intervention. SILS for performing laparoscopic cholecystectomy has a long way to go: from single observations, and small series of patients to large multicenter randomized trials. Future scientific searches will be focused at this direction. At the same time, the accumulation of clinical experience and scientific material comparing the SILS with the hybrid SSRLC Needlescopic LC and with NOTES, will continue. The future will show whether these techniques will prove themselves alongside the conventional multi-port laparoscopic cholecystectomies that won their status of classical techniques for surgical treatment of the gallstone disease. The RRS platforms are still a promise for the future, despite the high expectations for this type of procedures to overcome the technical challenges and difficulties of SILS.

Few systematic studies published last year showed the SSRLC feasibility and safety. Still, these techniques are limited within specific centers that develop the robotic surgery. The analysis of the human factor is very important in terms of safety of any surgical procedure, especially at the stage of establishing standards. Therefore, the future development course of the human factor will be directed towards standardization of skills and development of uniform protocols for carrying out surgical procedures by the new techniques. [20, 21] Similar to all other areas where a technical risk exists, the standardized protocols and algorithms are those that reduce the level of errors and increase the patient safety. [22] Their elaboration results from a complex interaction between number of individual, group and institutional factors and interests. They interact with each other in a sui generis polycentric model (Figure .1.)

Fig .1. Polycentric Model of Interaction between Factors and Interests.



CONCLUSIONS

1. Single-port laparoscopic techniques for performing laparoscopic cholecystectomy are an acceptable alternative to the classical conventional multi-port techniques, however, in compliance with the diagnostic and treatment protocols, and selection criteria for patients to be treated surgically by these methods.

2. The indications for performing SIL Surgery are

more limited than those of the traditional conventional multi-port techniques for laparoscopic cholecystectomy.

3. Security of laparoscopic cholecystectomy requires a precise anatomical identification of the anatomical structures (Level I, Grade A). The intraoperative cholangiography can reduce the level and severity of the iatrogenic lesions of extra hepatic bile ducts, and can contribute to their early detection.

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