

Single Incision Laparoscopic and Transanal Colorectal Surgery

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Preface

Over the past 2 decades, we witnessed rapid development in minimally invasive surgery and this has brought about significant improvement in surgical outcome. Reduction of incision-associated complications such as adhesions, surgical site infection, and incisional hernia is considered an important advantage of laparoscopic surgery.

Laparoscopic colorectal surgery started in the early 1990s and currently most colorectal resections can be performed with laparoscopy. In most cases, however, the procedure is laparoscopically assisted one and an incision is usually required to retrieve the specimen and to restore the bowel continuity.

The quest towards a more minimally invasive approach has led to the development of surgical technique to reduce the size and number of incisions. Natural orifice transluminal endoscopic surgery (NOTES) has gained tremendous enthusiasm in the last decade. However, the platform and the instruments are far from mature for general application.

Single incision laparoscopic surgery (SILS), although not a totally new concept, has emerged in recent years as an alternative to NOTES and some regard the umbilicus as a natural orifice. Nowadays, operations of different complexity can be performed using SILS and these include most colorectal procedures. SILS involves manipulation of laparoscopic instruments within a small access device and acquisition of a new set of skills is needed.

TEM was developed in 1983 by Gerhard Buess and the technique enables transanal excision of rectal lesions under direct vision. It represents both a minimally invasive and a natural orifice approach to rectal lesions. Over many years, TEM was confined to local excision of early rectal lesions. Recently with the increased interest in natural orifice surgery, the scope of TEM has been expanded to more complex operations. TEM and SILS are becoming more popular minimally invasive approaches to colorectal diseases. The skills for both techniques are similar in many aspects. Therefore, we decided to produce a book with the objective to help general and colorectal surgeons to acquire these two increasingly applied techniques.

“Single incision laparoscopic and transanal surgery” is written with the objective to introduce SILS for colorectal surgery and TEM to surgeons. It is divided into two sections. The first section concentrates on single incision laparoscopic colorectal surgery. It starts with the introduction of the instruments and skills needed for SILS. This is followed by individual colorectal procedures, from simple right colectomy to restorative proctocolectomy. The outcomes and currently available outcome data are also discussed.

In the second section, the chapters are on TEM. The indications, techniques, and outcomes of the procedures for local excision are described and the following chapters are on the advanced application of TEM.

The contributors are experts in the fields with vast experience in SILS or TEM. In this book, individual procedures are illustrated in detail and the tricks for a successful operation are described. We hope that this book can encourage surgeons with experience in laparoscopic colorectal surgery to acquire the knowledge and skills of SILS and TEM, rendering these techniques as part of their armamentarium. The book also serves as an introduction of SILS and TEM to general surgeons, surgical fellows, and residents who would like to learn these skills for their practice.

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Platforms and Instruments (Principles of Single-Incision Laparoscopic Colorectal Surgery, Available Platforms and Instruments)

Skandan Shanmugan and Bradley J. Champagne

Introduction

In 2013, conventional laparoscopic colorectal surgery has become a safe and effective alternative to open colorectal surgery. Furthermore, laparoscopic surgery has been proven to be associated with better outcomes, reduction in postoperative pain, shorter hospital stay, and earlier return to normal activity [1–3]. These advantages have also been achieved without compromising oncological outcomes [4–7]. In standard laparoscopic surgery, three to five ports are routinely required. Despite the small skin and fascial incisions (5–12 mm), patients do experience pain and discomfort over port sites. There are also inherent risks to visceral and epigastric vessels during port introduction and development of port-site incisional hernias [8]. Furthermore, public perception has recently become swayed as surveys have shown that patients have a negative perception of surgical scars and would prefer “scarless” surgery [9]. The drive to move toward incision-less or scarless surgery without compromising surgical principles and safety has led to the development of single-incision laparoscopic surgery. There are several acronyms for single-incision laparoscopic

surgery given the various competing port devices and platforms developed by industry manufacturers (Table 1.1).

SILCS (single-incision laparoscopic colorectal surgery) represents a potential advance in minimally invasive approaches to colorectal disease. Although widely promoted, data for improved outcomes are virtually absent but preliminary data demonstrate that SILCS can be performed safely in selected patients by experienced surgeons [10]. The actual benefits of single incision compared with multiple-port laparoscopic colectomy are not immediately evident and may be beyond that of simple cosmetics. This will be discussed elsewhere in this textbook.

Despite the growing enthusiasm for SILCS, there are several challenges compared with standard multi-port laparoscopic colectomy. Handling straight instruments in parallel with the laparoscope through a small incision decreases the range of movement for the surgeon and complicates camera use by the assistant. These difficulties become evident during colorectal surgery because, unlike laparoscopic cholecystectomy or appendectomy, SILCS often requires operating in different abdominal quadrants. Furthermore, the learning curve of undetermined length still exists for multi-port laparoscopy and is more exhaustive than for other minimally invasive procedures.

Multi-port laparoscopic colectomy traditionally relies on the principles of triangulation and traction/counter-traction to facilitate the precise dissection of anatomical planes.¹¹ These essential principles require significant modification to

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