SINGLE INCISION LAPAROSCOPIC SURGERY

" REVIEW STUDY "

Essay

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By

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بسم الله الرحمن الرحيم

سورة الذاريات اية ٢١

صدق الله العظيم

To my family

To those who back up and tolerate me despite all difficulties

To those who provide me with their encouragement

Mohammed

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Abstract

Key Words : - *laparoscopic surgery; Single incision ; Innovation technique ; ergonomics*

Single-incision laparoscopic surgery (SILS) is a "new" method to perform "old" operations. This review will discuss the history of laparoscopic surgery , Innovation in laparoscopic surgery as a general consideration, Evolution of SILS, Clinical Anatomy of the Umbilicus, basic technique of SILS, and its potential advantages and possible disadvantages. We will overview the Ergonomic principles in SILS in contrast to basic ergonomics in conventional laparoscopic surgery and the scope of SILS.

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LIST OF ABBREVIATIONS	
AAGL	American Association of Gynecologic Laparoscopists
CO2	Carbon dioxide
CVS	critical view of safety
E-NOTES	embryonic natural orifice transumbilical endoscopic surgery
ICSAD	Imperial College Surgical Assessment Device
IOC	intraoperative Cholangiography
LC	Laparoscopic cholecystectomy
LCD	Liquid Crystal Display
LESSS	Laparo-Endoscopic Single Site Surgery
MIS	minimally invasive surgery
NOTES	Natural orifice translumenal endoscopic surgery
NOTUS	natural orifice transumbilical surgery
OT	Operative table
S3	Single Site Surgery
SAS	Single-Access Surgery
SAVES	Single-Access Video Endoscopic Surgery
SILC	single-incision laparoscopic cholecystectomy
SILS	single-incision laparoscopic surgery
SIMPL	Single-incision, multiport laparoscopy
SLIT	single laparoscopic incision transabdominal
SPA	single-port access
TM	Trade Mark
TUES	Trans Umbilical Endoscopic Surgery

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INTRODUCTION

INTRODUCTION

For many years, large incisions were required to perform abdominal surgical procedures. Although effective, multiple morbidities were associated with this method, including postoperative pain, wound infection, incisional hernia, and prolonged hospitalization. The current rate of wound infection is 2 to 25 percent, and occurrence of incisional hernia is 4 to 18 percent in US patients **(*McGee et al., 2006).***

Some surgeons' perceptions that complications and morbidities were associated with the size and extent of the incision led them to minimize their incision length. Laparoscopy, prevalent in gynecologic surgery for many years, was widely introduced to the general surgical domain with laparoscopic cholecystectomy more than 20 years ago. By making much smaller incisions that were protected by a port, there was a great reduction in incision-related complications. There was faster postoperative recovery, pain reduction, less need for narcotics, respiratory function improvement, decrease in infection and hernias, and better overall cosmesis. However, with the introduction of a new technique came a price ***(Hochberger et al., 2005).***

Before the safety of the technique could be verified and standardized, the procedure was introduced with haste, causing higher rates of common bile duct injury and other complications. Over time, the complication rates decreased and advantages of minimal, small incisions were recognized and accepted as the gold standard. Surgeons continued to make modifications to reduce the number of incisions. For example, laparoscopic cholecystectomy, which typically requires four incisions, was modified to two or three trocar incisions. Others reduced the size of incisions and instrumentation to 2 to 3mm. ***(Saltzman et al., 2004)***

Although endoscopic technology has been widely available, it was initially confined to the luminal walls. However, when accidental puncture of the stomach during polypectomy showed another way to access the peritoneal cavity, the possibility of scarless, incisionless surgery was introduced. Natural orifice

translumenal endoscopic surgery (NOTES) was envisioned as perhaps the ultimate form of minimally invasive surgery—with many potential benefits, including reduction of pain and recovery period, minimal anesthesia and analgesia, and no external scar. Basically, NOTES involves placing a flexible endoscope through one of the body's natural orifices, such as the mouth, anus, vagina, or urethra, to gain access to a body space to perform surgery.***(Pearl et al., 2008)***.

However, with the advent of every novel technique, there are limitations and shortcomings. Lack of specific instrumentation, safe viscerotomy closure technique/devices, and difficulty with patient recruitment has limited its implementation. Knowing the importance and the potential benefits of NOTES yet realizing current limitations of the technique, surgeons are developing single-incision laparoscopic surgery in parallel, perhaps as a bridge between standard laparoscopy and NOTES. ***(Marks et al., 2007)***

Single-incision surgery has been given a panoply of acronyms and names, including single-incision laparoscopic surgery (SILS), single-port access (SPA) surgery, single laparoscopic incision transabdominal (SLIT) surgery, natural orifice transumbilical surgery (NOTUS), and embryonic natural orifice transumbilical endoscopic surgery (E-NOTES). SILS has been described since the late 1990s, beginning with appendectomy and cholecystectomy. Since then, the technique has been applied to multiple surgical procedures, including gastric banding, sleeve gastrectomy, splenectomy, nephrectomy, colectomy, and adrenalectomy.***(Reavis et al., 2008)***

It seems logical that eliminating multiple incisions/port sites would further decrease associated morbidity. However, no prospective, randomized study demonstrating clear advantage over standard laparoscopy has been reported. The tenet of single-incision laparoscopic surgery is to reduce the number of incisions to one, typically at the umbilicus, for multiple trocar placements. Since SILS procedures are

relatively new and in evolution, many techniques have been described but no widely accepted standard exists. SILS was first adapted to cholecystectomy and once the technique was shown to be safe and effective for basic laparoscopic procedures, it was applied to some of the technically simpler bariatric procedures. Multiple techniques and instruments have been developed. Because the primary benefit of SILS seems to be cosmetic, most agree that the umbilicus is the preferred incision site; however, it is at this point that the techniques diverge ***(Nguyen et al., 2008).***

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