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SINGLE INCISION LAPAROSCOPIC SURGERY (SILS) APPENDICECTOMY : A REVIEW

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ABSTRACT

Appendectomy is commonly performed abdominal operation in emergency condition . It was already proved that the laparoscopic procedures were more comfortable in obese patients . The latest version now is the Single-Incision Laparoscopic Surgery (SILS). There will not be any visible scar over anterior abdominal wall. It has special interest in research for general surgeons.

The most common surgeries namely cholecystectomy, appendectomy and etc have been currently being performed using this technique. In this procedure (SILS) there will be only small scar over umbilicus which has les post operative pain.

Here , we did the study of SILS for the acceptance of surgeons in acute appendicitis's management.

KEYWORDS

acute appendicitis, Laparoscopic appendectomy & Single incision laparoscopic surgery (SILS).

INTRODUCTION

The most common acute condition of abdomen is acute appendicitis which needs emergency surgery like appendectomy. The invention of the laparoscopic appendectomy has become one of alternative method[1].

Usually three trocars would be inserted following three incisions. Here we use one incision to introduce three ports in to peritoneal cavity.

SILS surgery is called by the name single-port access surgery (SPAS)[2]. The scarless surgeries SILS and natural orifice endoscopic surgery (NOTES) are more interesting latest procedures.

A review of article was done by us regarding the techniques of SILS for it's management..

OBJECTIVE

Our aim of this study was to understand the procedures of SILS and it's management.

MATERIALAND METHODS

The list of search engines: Yahoo, Pubmed, Google, Medline, and the online.

The terms used for this search are :
" single incision laparoscopic surgery".

RESULTS

Many informations are available regarding SILS in online. Many articles are taken from case reports. We used only nineteen articles for the study of review of our paper..

DISCUSSION

The method is visualizing the abdominal cavity by using the instruments. The example of such method is by using a single incision through skin in which many instruments can be introduced into the peritoneal cavity.

Navarra et al. published the very first report and he did a SILS cholecystectomy in the year 1997[3]. Later , many surgeons started to do the procedures SILS appendectomy etc. Latter the release of gastric band were undergone[4].

Byron F. et al, demonstrated a study of Fundamentals of Laparoscopic Surgery (FLS) method SILS procedure[5] (figure 1).He shows and performs SILS procedure .

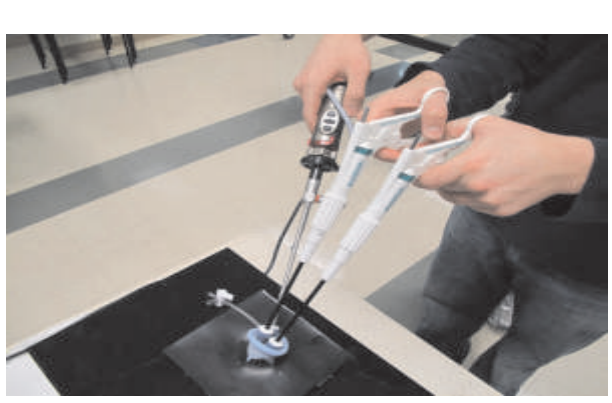

Figure 1
SILS simulator-one port with multiple instruments in a one incision.

The results of this study :
a)SILS is more useful by technique when compared to regular and conventional laparoscopy methods.
b)SILS would be best for the surgeons who have good experience in LAPARACOPIC procedures.
c)LAP surgical experience is not equal to SILS .

ii). Surgery procedure

A new procedure is announced to the surgeons. The surgeons are focused in safety ,clinical advantage and feasibility of the method. Jyrki K¨ossi and Markku Luostarinen et al published a article stating their exposures in various conditions of various institution regarding their early exposures of SILS appendectomy[6].

a).SILS for entry into abdominal cavity and is used as site of entry. In SILS, intraumbilical cutaneous incision has to be done.Tthe umbilicus has to be separated from the fascia. Then it has to be opened (2-3 cm). The SILS port was got into the abdominal cavity. (figure 2).

Figure 2- Single port with more instruments.

b). In the SILS procedure, the various instruments are introduced in to peritoneal cavity without disturbing other instruments.
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c) Surgeon has to think about various differential diagnosis and the appendicitis could be other complications of appendicitis such as gangrenous, perforated appendicitis and peritonitis with or without abscess.

Jyrki et al[6], stated the complicated and uncomplicated appendicitis . All were managed by SILS technique without conversions (laparotomy)(Table 1)

(Table 1)

Patient description	Operative finding	Operation	Operative time (min)	Discharge (days)	Note
Male, 40 years	Appendicitis	Appendectomy	38	1	Typical uncomplicated appendicitis
Female, 18 years	Perforated appendicitis, covered by terminal ileum	Appendectomy	44	4	Restricted infection, incipient abscessus formation
Female, 63 years	Perforated appendicitis, diffuse peritonitis	Appendectomy, lavation	50	5	Hospital stay prolonged due to peritonitis
Female, 63 years	Appendicitis	Appendectomy	37	1	Obese patient, BMI 31, operative time reasonable
Female, 16 years	Ovarian cyst rupture	Appendectomy, explorative laparoscopy	34	2	Aspiration of pelvic fluid collection

Their mean operating time was 40 minutes comparing well to the operating time of conventional laparoscopic appendectomy in their hospital (mean 43 minutes, range 18–103) and in a recent Cochrane review (mean 23.5–102 minutes)[7].

Jin A Lee, Ki Young Sung, Jun Hyun Lee, Do Sang Lee et al stated after their study in their institution as review on on Laparoscopic Appendectomy with a single incision[8].

This study Table 2 shows (26.2%); 37 are male patients and 38 were female patients. 21.84 kg/m^2 was BMI of these patients and the duration of symptoms was 1.92 days. (Table 2)[8].

Table 2. Characteristics of patients [20]

Characteristics	Male (n = 37)	Female (n = 38)	All (n = 75)
Age (yr)	27.08 ± 14.89	26.37 ± 15.70	26.72 ± 15.20
BMI (kg/m2)	22.81 ± 3.93	20.87 ± 3.20	21.84 ± 3.70
Symptom duration (day)	1.68 ± 0.58	2.16 ± 0.80	1.92 ± 0.74
Operation time (min)	64.32 ± 36.23	52.92 ± 26.03	58.55 ± 31.80
Pre.op WBC	12,594.59 ± 3,636	11,921.08 ± 4,882	12,257.84 ± 4,288
Pre.op seg. Neutrophil (%)	76.67 ± 10.0	77.3 ± 10.55	76.98 ± 10.22
Discharge recommend (POD)	1.7 ± 1.08	1.65 ± 0.72	1.68 ± 0.90
Hospital stay (POD)	3.03 ± 1.48	2.73 ± 0.87	2.88 ± 1.22

BMI, body mass index; Pre.op, pre-operative; WBC, white blood cell; seg., segment; POD, post-operative day.

In the study, the severity of inflammation in appendicitis was categorized as suppurative or perforating appendicitis based on the biopsy results after the surgery. Among patients, 55 of them had suppurative appendicitis, and 20 of them had perforated appendicitis.

Table 3. Perioperative surgical outcomes in relation to inflammation [20]

	Suppurative appendicitis	Perforative appendicitis	Pvalue
Patients (n)	55	20	0.108
Age (yr)	24.69 ± 14.22	32.3 ± 16.76	0.461
BMI	21.55 ± 3.82	22.64 ± 3.28	0.097
Symptom duration (day)	1.8 ± 0.60	2.25 ± 0.97	0.49
Operation time (min)	23.73 ± 25.72	71.8 ± 42.47	0.639
Pre.op WBC	11,915.93 ± 4,392.69	13,181 ± 3,951.34	0.008
Pre.op seg. Neutrophil (%)	75.77 ± 11.14	80.27 ± 6.32	0.012
Discharge recommend (POD	1.39 ± 0.66	2.45 ± 1.05	0.012
Hospital stay (POD)	2.54 ± 0.89	3.8 ± 1.51	0.032

BMI, body mass index; Pre.op, pre-operative; WBC, white blood cell; seg., segment; POD, post-operative day.

They found out that there were significant differences in the suggested day of discharge and the hospitalization period after surgery. (Table 3).

There was no age difference , pre operative time white cell count and the hospital admission period after dividing the total patient group with BMI 23 as the standard (Table 4)[13].

Table 4. Perioperative surgical outcomes in relation to BMI [20]

	BMI < 23	BMI = 23	Pvalue
Patients (n)	45	29	
Age (yr)	23.51 ± 14.34	32.51 ± 15.24	0.286
Operation time (min)	55.22 ± 25.62	64.86 ± 39.25	0.72
Pre.op WBC	11,772 ± 3,620.2	13,011.72 ± 5,137.11	0.244
Pre.op seg. Neutrophil (%)	76.47 ± 11.02	77.79 ± 8.97	0.255
Discharge recommend (POD)	1.47 ± 0.73	2 ± 1.07	0.069
Hospital stay (POD)	2.73 ± 1.05	3.1 ± 1.42	0.233

BMI, body mass index; Pre.op, pre-operative; WBC, white blood cell; seg., segment; POD, post-operative day.

The study also had also analyzed on how the BMI value may affect the operation time and the hospitalization period. This study, Jyerki et stated that SILS procedure is faster and simple[6].

Fatty patients were really got benefit in laparoscopic appendectomy[8]. So SILS method is more apt in fatty patients.

Table 1, Jyerki et: SILS procedure , the postoperative pain is less.

In this procedures , all the techniques are more simpler and found to be apt for SILS appendectomy[6].

No difference between open and traditional laparoscopic appendectomies were noted[9]. We can not see any scar in the SILS procedure (figure 3).

Figure 3 :No scar of SILS

iii). SILS and it's complication

Tonouchi et al[10] said about port site hernia was 0.65%-2.80%. In SILS, the chances of port hernia is more common when compared to conventional method.

iv) Feasibility and safety of SILS technique

Some studies showed that SILS needs longer time [12-18]. SILS has good cosmetic results.

CONCLUSION

This SILS procedure is more safe for diagnostic and therapeutic appendectomy. This is more suitable for fatty patients .SILS would be better for the surgeon who are going for training. It also has some disadvantages also.

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