

# Cosmetic outcome of single-port versus multiple-port laparoscopic surgery in gynaecology

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**Objective:** To compare single-port laparoscopic surgery (SPLS) with multiple-port laparoscopic surgery (MPLS) in terms of cosmetic outcome, operating time, and length of hospital stay.

**Methods:** We retrospectively retrieved all SPLS cases performed in the gynaecology department at Queen Elizabeth Hospital during 2017 to 2018. Same number of matched MPLS cases performed within the same period was retrieved randomly for comparison. Patient satisfaction regarding surgical scar was assessed using the modified Patient Scar Assessment Questionnaire. Only the satisfaction rating was used. Score for each item ranges from 1 (least satisfied) to 4 (very satisfied).

**Results:** 12 patients who underwent SPLS were compared with 12 randomly selected matched patients who underwent MPLS. Both SPLS and MPLS groups scored highly for the Patient Scar Assessment Questionnaire. SPLS group generally scored slightly higher than MPLS group and significantly higher in items: the colour of the wound associated with surrounding tissue, the height of the scar, overall appearance, and overall symptoms from the scar. 91.7% of SPLS patients and 58.3% of MPLS patients preferred the respective techniques if given a choice.

**Conclusion:** Both SPLS and MPLS achieved exceptional cosmesis outcomes, but SPLS was superior to MPLS in some items. More patients may prefer SPLS if they are aware of the technology.

*Keywords:* Cosmetics; Gynecology; Laparoscopy

## Introduction

Single-port laparoscopic surgery (SPLS) is gaining popularity worldwide. In gynaecology, SPLS has been performed for ectopic pregnancy, ovarian cystectomies, hysterectomies, and other laparoscopic gynaecological surgeries<sup>1,2</sup>. Compared with multiple-port laparoscopic surgery (MPLS), SPLS is reported to be associated with reduced time for specimen retrieval, fewer ruptured retrieval bags, lower pain score, and less frequency in analgesia use<sup>2,3</sup>, with comparable length of hospital stay and improvement in quality of life<sup>4,5</sup>. SPLS results in better cosmetic appearance and scar satisfaction, compared with MPLS<sup>6</sup>. We aimed to compare SPLS with MPLS in terms of cosmetic outcome, operating time, and length of hospital stay.

## Methods

This study was approved by the Kowloon Central / Kowloon East Research Ethics Committee (Reference: KC/KE-19-0291/ER-1). We retrospectively retrieved all SPLS cases performed in the gynaecology department at Queen Elizabeth Hospital during 2017 to 2018 by gynaecologists with advanced level laparoscopic accreditation under the Hong Kong College of Obstetrics and Gynaecologists. Same number of matched MPLS cases performed within the same period was retrieved randomly for comparison.

SPLS was performed via a 2-3 cm umbilical port using a transumbilical tripod system (Olympus TriPort15) with non-articulated instruments. The rectus layer was closed using continuous 1-0 vicryl, and the fascia layer was approximated by continuous 1-0 vicryl with subcuticular vicryl to skin. MPLS was performed via a routine 1-cm umbilical port of entry with two to three 0.5-cm accessor ports at left iliac fossa, left lateral (umbilical level), right iliac fossa, or suprapubic site of entry. The umbilical wound was closed using interrupted 1-0 vicryl, whereas accessory ports were closed using sterile strips.

Patient satisfaction regarding surgical scar was assessed using the modified Patient Scar Assessment Questionnaire<sup>7</sup> at 8-week follow-up or via phone interview at 8 to 12 weeks. The questionnaire is validated and has two components: attribute and satisfaction. Only the satisfaction rating was used and translated to Chinese for those preferred the Chinese version. Score for each item ranges from 1 (least satisfied) to 4 (very satisfied). There was one additional question: do you prefer SPLS or MPLS if given a choice.

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Data retrieved included operating time and length of hospital stay. When comparing operating time, those with multiple surgeries (hysteroscopy dilatation and curettage or extensive adhesiolysis) at the same settings or those with hysterectomy or myomectomy were excluded, as their operating time was longer than those with laparoscopic surgeries for ovarian cysts. When comparing ovarian cyst size, the mean size was calculated as per largest diameter for unilocular cysts and as combined diameters for multiloculated unilateral or bilateral cysts.

Statistical analysis was performed using SPSS (Windows version 22; IBM Corp, Armonk [NY], US). The SPLS and MPLS groups were compared using analysis of variance. A value of  $p < 0.05$  was considered statistically significant.

## Results

12 patients underwent SPLS for unilateral oophorectomy (for ovarian fibroma) [n=1], bilateral salpingoophorectomy (n=2), bilateral salpingoophorectomy and hysteroscopy dilatation and curettage (for irregular menstruation) [n=1], unilateral ovarian cystectomy (n=7), and unilateral ovarian cystectomy and hysteroscopy dilatation and curettage (n=1). In addition, 12 matched patients were randomly selected who underwent MPLS for myomectomy (n=1), bilateral salpingoophorectomy (n=3), unilateral ovarian cystectomy (n=8), and unilateral ovarian cystectomy and hysteroscopy dilatation and curettage (n=1) [Table 1].

The SPLS and MPLS groups were comparable in terms of patient age (34.8 vs 37.3 years,  $p=0.717$ ), time of interview for questionnaire (8.25 vs 9.08 weeks,  $p=0.147$ ), ovarian cyst size (after excluding 2 cases of fibroid removal) [3.5 vs 5.83 cm,  $p=0.347$ ], and operating time

(after excluding 3 cases of combined procedures and 1 case of myomectomy) [74.9 vs 70.6 mins,  $p=0.661$ ]. No patients had body mass index exceeding 30.

Both SPLS and MPLS groups scored highly for the Patient Scar Assessment Questionnaire. SPLS group generally scored slightly higher than MPLS group and significantly higher in items: Q1 (the colour of the wound associated with surrounding tissue), Q5 (height of the scar), Q9 (overall appearance), and Q15 (overall symptoms from the scar) [Table 2]. 91.7% of SPLS patients and 58.3% of MPLS patients preferred the respective techniques if given a choice.

## Discussion

SPLS has been demonstrated to be safe in multiple surgical and gynaecological surgeries<sup>8</sup>. Nonetheless, it remains a relatively new technique in Hong Kong. SPLS has been reported to offer better cosmesis and patient satisfaction than MPLS in cholecystectomy<sup>9-14</sup>. Cosmetic outcome is particularly important for women. Nonetheless, there are few studies on cosmetic outcomes of SPLS in gynaecology.

Our study suggested that both SPLS and MPLS achieved exceptional cosmesis outcomes as measured by the Patient Scar Assessment Questionnaire, but SPLS was superior to MPLS in terms of the colour of the wound associated with surrounding tissue, the height of the scar, overall appearance, and overall symptoms from the scar. The overall score between the SPLS and MPLS groups was comparable. This may be due to the comparable cosmesis outcome. It may also be due to the lack of public awareness of SPLS and hence no higher expectation on MPLS by patients. This was reflected by the fact that more patients preferred SPLS if given a choice.

**Table 1. Types of surgery performed using single-port versus multiple-port laparoscopic surgery**

Type of surgery	No. of patients	
	Single-port laparoscopic surgery (n=12)	Multiple-port laparoscopic surgery (n=12)
Myomectomy	0	1
Unilateral oophorectomy	1	0
Bilateral salpingoophorectomy	2	3
Bilateral salpingoophorectomy and hysteroscopy dilatation and curettage	1	0
Unilateral ovarian cystectomy	7	8
Unilateral ovarian cystectomy and hysteroscopy dilatation and curettage	1	1

**Table 2. Cosmetic outcomes, operating time, and length of hospital stay of single-port versus multiple-port laparoscopic surgery**

Parameter	Single-port laparoscopic surgery (n=12)	Multiple-port laparoscopic surgery (n=12)	p Value
Mean patient age, y	34.8	37.3	0.717
Mean time of interview for questionnaire, follow-up weeks	8.25	9.08	0.143
Mean Patient Scar Assessment Questionnaire score	54.58	50.33	0.114
Q1	3.67	3.25	0.045
Q2	3.58	3.25	0.180
Q3	3.83	3.5	0.09
Q4	3.75	3.5	0.216
Q5	3.58	3.08	0.03
Q6	3.5	3.25	0.216
Q7	3.42	3.0	0.092
Q8	3.58	3.25	0.105
Q9	3.67	3.25	0.045
Q10	3.42	3.5	0.688
Q11	3.67	3.58	0.680
Q12	3.67	3.42	0.229
Q13	3.83	3.58	0.187
Q14	3.67	3.67	1.000
Q15	3.75	3.25	0.016
Mean ovarian cyst size, cm	3.5	5.83	0.347
Mean operating time (excluding combined procedures or myomectomy), mins	74.89	70.6	0.661
Mean length of hospital stay, d	2.33	2.33	1.000
Do you prefer single-port or multiple-port laparoscopic surgery if given a choice	11/12 (91.7%)	7/12 (58.3%)	

Nonetheless, SPLS is technically more difficult than MPLS. Proximity of instruments and difficult ergonomics may hinder the freedom of movement and affect operating time. However, operating time does not vary a great deal in experienced hands<sup>4</sup>. In our study, operating time was longer in SPLS for smaller ovarian cysts but not significantly. The operating time can be reduced with simulation training, increased experience, use of articulate instruments, and proper case selection.

There are limitations to this study. The sample size was too small to have sufficient statistical power. The study was retrospective, and randomised controlled trials are needed to confirm the findings. Only the satisfaction rating of the Patient Scar Assessment Questionnaire was used; the attribute rating was removed. The Chinese version of the questionnaire was not validated, and meanings of certain

questions may be lost in translation. Objective evaluation of cosmetic outcomes by an independent observer could have reduced bias. Reasons for the preference for SPLS and complications of SPLS and MPLS should have been investigated. Our study could not demonstrate SPLS to be superior to MPLS.

## Conclusion

Both SPLS and MPLS achieved exceptional cosmesis outcomes, but SPLS was superior to MPLS in some items. More patients may prefer SPLS if they are aware of the technology. SPLS also has benefits of reduced pain and reduced analgesia used.

## Declaration

The authors have no conflict of interest to disclose.

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