Recovery of quality of life after laparoscopic myomectomy

Yoko Tsuzuki[1], Shinya Tsuzuki[2], Shinichiro Wada[1], Yoshiyuki Fukushi[1] and Takafumi Fujino[1]

[1]Department of Obstetrics and Gynecology, Teine Keijinkai Hospital and [2]Department of Hygiene, Hokkaido University, Sapporo, Japan

Abstract

Aim: It is commonly thought that laparoscopic surgery leads to faster postoperative recovery for its low invasiveness. We evaluated postoperative quality of life (QOL) after laparoscopic myomectomy (LM) by using the Euro-QOL 5 dimension (EQ-5D) score and analyzed its relationship to surgical factors.

Methods: Between 2014 and 2016, 541 patients underwent LM at our institution. We included 86 patients in the final analysis (16% response rate) who replied to the EQ-5D questionnaire, in order to investigate postoperative QOL. We evaluated patients' EQ-5D score before the operation and on the 3rd, 7th, 14th, 21st and 28th postoperative day (POD). We investigated the degree of correlation between the EQ-5D score and four surgical characteristics (operation time, intraoperative bleeding, number of resected myomas and weight of specimen). We examined correlation between EQ-5D scores and chief complaints such as hypermenorrhea, dysmenorrhea, other pain, myoma enlargement, palpable tumor and desire for childbearing. We also examined correlation between EQ-5D scores and other factors such as patient's age, infertility, history of abdominal surgery, marriage and body mass index.

Results: Full recovery, defined as an EQ-5D score of 1.0, was reported 2.3% of patients by POD3, 18.6% by POD7, 58.1% by POD14, 73.3% by POD21 and 86.0% by POD28.

Longer duration of operation correlated weakly with poor recovery on POD3. Intraoperative bleeding, number of resected myomas and weight of the specimen did not significantly influence EQ-5D score. There was no correlation between chief complaints or other factors mentioned above and EQ-5D score.

Conclusions: More than a half of the patients undergoing LM included in our study reported full recovery of QOL after 2 weeks. The time to recover QOL was slightly influenced by the operation time. However, when LM was finished without any complications, postoperative QOL eventually seemed to improve regardless of the surgical characteristics such as operation time, intraoperative bleeding, number of resected myomas and weight of specimen.

Key words: EQ-5D score, laparoscopic myomectomy, laparoscopic surgery, postoperative recovery, QOL.

Introduction

Uterine leiomyomas are benign smooth muscle tumors of the myometrium, seen in 80% of reproductive-aged women, and manifesting clinically in approximately 25%.[1] Myomas may be the cause of abnormal uterine bleeding, pelvic pain, infertility and urinary or bowel complaints.[2]

Myomectomy is an accepted treatment for women with symptomatic myomas who wish to preserve fertility.[3] Laparoscopic myomectomy (LM) is associated with less postoperative pain, blood loss, and shorter

hospital stays, and it is more cosmetically acceptable (smaller scars) than abdominal myomectomy.[4] LM is widely recognized for being less invasive, and prior studies have reported earlier recovery than abdominal myomectomy.[4] However, only few studies have examined it quantitatively. We aimed to evaluate postoperative quality of life (QOL) quantitatively using the Euro-QOL 5 dimension (EQ-5D) score and correlated the results with surgical factors. This study has been approved by the research ethics committee of Teine keijinkai hospital.

Methods

We included 86 patients who completed an EQ-5D questionnaire adequately out of 541 patients who underwent LM in our hospital from 2014 to 2016 (16% response rate). We distributed EQ-5D questionnaires to all the patients during the hospitalization and asked them to complete the questionnaires. There were no major complications observed in all cases.

EQ-5D is a method used to measure an individual's health status quantitatively and assesses five dimensions of health-related QOL (mobility, self-care, usual activities, pain/discomfort and anxiety/depression) using three levels (no problems, some/moderate problems and extreme problems) (Table 1). The patients choose one statement that describes their health in each of the five dimensions, and the answers

Table 1 Euro-QOL 5 dimension questionnaire

Mobility
1. I have no problems in walking about.
2. I have some problems in walking about.
3. I am confined to bed.

Self-care
1. I have no problems with self-care.
2. I have some troubles washing or dressing myself.
3. I am unable to wash or dress myself.

Usual activities
1. I have no problems with performing my usual activities.
2. I have some problems with performing my usual activities.
3. I am unable to perform usual activities.

Pain/Discomfort
1. I have no pain or discomfort.
2. I have moderate pain or discomfort.
3. I have extreme pain or discomfort.

Anxiety/Depression
1. I am not anxious or depressed.
2. I am moderately anxious or depressed.
3. I am extremely anxious or depressed.

were converted to EQ-5D score based on the utility value of Japanese edition constituted from 0 meaning death to 1 meaning full QOL (details of conversion table are shown in Appendix S1).[5]

We collected the questionnaires by postal mail or fax and evaluated them before the operation and on the 3rd postoperative day (POD3), 7th (POD7), 14th (POD14), 21th (POD21) and 28th (POD28).

We assessed correlations between EQ-5D scores and four characteristics of the surgery (operation time, amount of intraoperative bleeding, number of resected myomas and weight of specimen). In addition, we examined correlation between EQ-5D scores and chief complaints such as hypermenorrhea, dysmenorrhea, other pain, myoma enlargement, palpable tumor and desire for childbearing. We also examined correlation between EQ-5D scores and other factors such as patient's age, infertility, history of abdominal surgery, marriage and body mass index. The characteristics of the surgery, patient's age and body mass index were assessed by Spearman's rank correlation coefficient. The differences among the responder and non-responder groups, chief complaints and factors such as infertility, history of abdominal surgery and marriage were assessed by the Mann–Whitney U test. Patients who were infecund for more than 1 year were classified as infertility. We set P-value <0.05 as a significant level.

Results

All patients' background and results of the operations are presented in Table 2. There were no cases of conversion to laparotomy. All patients were discharged on POD3 without complications. The number of resected myomas was larger in patients who did not reply the questionnaire than patients who replied ($p < 0.001$).

The result of EQ-5D score of Japanese edition is presented in Table 3. The proportion of patients who responded 1 in EQ-5D score that means a state of full good health was 2.3% on POD3, 18.6% on POD7, 58.1% on POD14, 73.3% on POD21 and 86.0% on POD28 (Fig. 1).

After POD14, the QOL of almost 60% of patients was rated as 1. Therefore, we analyzed the correlation between the surgical factors and postoperative QOL before POD14 (Table 4). Regarding relevance between operation time and postoperative QOL on POD3, POD7, POD14, P-values were 0.048, 0.13 and 0.19,

Table 2 The background of all patients and results of operations

	Responders	Non-responders	*P*-value
Age (year)	39.0 (35.0–42.0)	38.0 (35.0–42.0)	0.74
Operation time (min)	108.5 (86.5–147.2)	103.0 (74.0–151.0)	0.20
Intraoperative bleeding (g)	100.0 (30.0–200.0)	50.0 (20.0–180.0)	0.16
Number of resected myomas	4.0 (2.0–8.0)	21.0 (3.0–35.0)	<0.001
Weight of specimen (g)	158.0 (88.5–289.0)	159.0 (73.3–303.0)	0.68

Values are median (interquartile range). We used the Mann–Whitney U test.

Table 3 The result of EQ-5D score

	POD3	POD7	POD14	POD21	POD28
EQ-5D score	0.58 ± 0.16	0.73 ± 0.60	0.87 ± 0.31	0.94 ± 0.28	0.97 ± 0.19

Abbreviations: EQ-5D, Euro-QOL 5 dimension; POD, postoperative day. Values are mean ± 2 standard deviation.

respectively. The *P*-value POD3 met the significance level of 5%, and ρ of Spearman's rank correlation coefficient was −0.21.

Regarding intraoperative bleeding and weight of specimen, postoperative QOL did not show significant difference at any time.

Regarding the number of resected myoma and postoperative QOL, *P*-value on POD14 met the significance level of 5% and ρ of Spearman's rank correlation coefficient was −0.23. The result of correlation between EQ-5D score and chief complaints or other factors mentioned above is shown in Table 5. There was no correlation between those variables.

Discussion

There are several prior studies about recovery after LM. Maris *et al.*[6] mentioned a more rapid recovery after LM, that is, 90% of patients after LM felt full recovery on POD15 compared with only 5% after abdominal myomectomy. Alessandri *et al.*[7] assessed that 90.3% of patients in the LM group fully recuperated by POD 15, which was superior compared with the minilaparotomy group. On the other hand, two studies found no difference between LM and abdominal myomectomy group, with one reporting mean time to return to work and the other reporting median number of days to full recovery.[8,9] In our study, the rate of full recovery after LM reached more than half on POD 14. Therefore, we think POD14 can be one of the criteria for full recovery and returning to work after LM. This information is useful especially for working patients who want to know when they might return to work. Moreover, Kikuchi *et al.*[10] reported the required number of days for specific daily activities and according to them, patients after
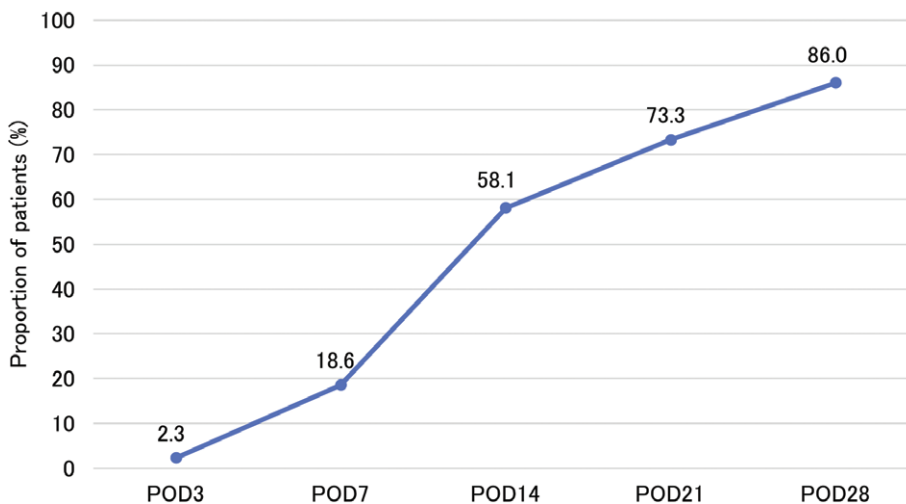
Figure 1 The proportion of patients whose quality of life fully recovered (i.e., their response to Euro-QOL 5 dimension questionnaire showed a value of 1.0). POD, postoperative day.

Table 4 The correlation between EQ-5D score and surgical characteristics

		QOL of POD3	QOL of POD7	QOL of POD14
Operation time	p-value	0.048*	0.13	0.19
	ρ	−0.21		
Intraoperative bleeding	p-value	0.22	0.70	0.75
	ρ			
Number of resected myoma	p-value	0.15	0.057	0.03*
	ρ			−0.23
Weight of specimen	p-value	0.37	0.25	0.56
	ρ			

Abbreviations: EQ-5D, Euro-QOL 5 dimension; POD, postoperative day; QOL, quality of life. *We used Spearman's rank test to investigate the degree of correlation and regarded P-value under 0.05 as statistically significant. When P-value was statistically significant, Spearman's ρ was also shown.

LM needed 5.5 days for housekeeping and 11.7 days for office work.

We had hypothesized that longer surgery time, heavier intraoperative bleeding, larger number of resected myomas, and heavier weight of specimen might lead to worse postoperative QOL. Regarding the relationship between operation time and postoperative QOL on POD3, ρ of Spearman's rank

Table 5 The correlation between the EQ-5D score and chief complaints or other factors such as patient's age, infertility, history of abdominal surgery, marriage and BMI.

		QOL of POD3	QOL of POD7	QOL of POD14
Hypermenorrhea	p-value	0.39	0.96	0.74
	EQ-5D score	0.59 (0.53–0.65)*	0.72 (0.60–0.77)*	0.75 (0.69–1.00)*
		0.60 (0.53–0.66)*	0.72 (0.65–0.77)*	1.00 (0.77–1.00)*
Dysmenorrhea	p-value	0.70	0.42	0.74
	EQ-5D score	0.60 (0.53–0.65)*	0.65 (0.60–0.77)*	1.00 (0.66–1.00)*
		0.60 (0.53–0.66)*	0.72 (0.65–0.77)*	1.00 (0.73–1.00)*
Other pain	p-value	0.95	0.68	0.94
	EQ-5D score	0.59 (0.56–0.62)*	0.69 (0.67–0.71)*	0.88 (0.83–0.94)*
		0.60 (0.53–0.65)*	0.72 (0.61–0.77)*	1.00 (0.72–1.00)*
Myoma enlargement	p-value	0.98	0.97	0.23
	EQ-5D score	0.60 (0.51–0.72)*	0.69 (0.65–0.77)*	1.00 (0.77–1.00)*
		0.60 (0.53–0.65)*	0.72 (0.60–0.77)*	1.00 (0.72–1.00)*
Palpable tumor	p-value	0.34	0.91	0.47
	EQ-5D score	0.60 (0.53–0.70)*	0.73 (0.58–0.84)*	1.00 (0.75–1.00)*
		0.60 (0.51–0.65)*	0.72 (0.65–0.77)*	1.00 (0.72–1.00)*
Desire for childbearing	p-value	0.84	0.56	0.62
	EQ-5D score	0.60 (0.53–0.65)*	0.72 (0.65–0.77)*	0.90 (0.77–1.00)*
		0.60 (0.53–0.65)*	0.71 (0.60–0.65)*	1.00 (0.72–1.00)*
Patient's age	p-value	0.59	0.92	0.25
Infertility	p-value	0.73	0.81	0.90
	EQ-5D score	0.59 (0.50–0.65)*	0.70 (0.69–0.72)*	0.88 (0.75–1.00)*
		0.58 (0.53–0.66)*	0.72 (0.60–0.77)*	1.00 (0.72–1.00)*
History of abdominal surgery	p-value	0.85	0.97	0.13
	EQ-5D score	0.60 (0.53–0.65)*	0.72 (0.60–0.77)*	0.75 (0.69–1.00)*
		0.60 (0.53–0.66)*	0.72 (0.65–0.77)*	1.00 (0.77–1.00)*
Marriage	p-value	0.66	0.20	0.86
	EQ-5D score	0.60 (0.53–0.65)*	0.72 (0.65–0.79)*	1.00 (0.77–1.00)*
		0.59 (0.53–0.69)*	0.70 (0.60–0.77)*	1.00 (0.72–1.00)*
BMI	p-value	0.30	0.14	0.60

Abbreviations: BMI, body mass index; EQ-5D, Euro-QOL 5 dimension; POD, postoperative day; QOL, quality of life.; Values are median (interquartile range).; We used the Mann–Whitney U test and Spearman's rank test. There was no correlation between the EQ-5D score and chief complaints or other factors such as patient's age, infertility, history of abdominal surgery, marriage, and BMI. *P-values were shown in the top line of each row. Median QOL values with interquartile range were shown in the middle line and the bottom line of each row. The middle line represents the values in the group to which patients who were positive for each factor, and the bottom line represents the values in the group to which patients who were negative for each factor.

correlation coefficient was −0.21, which meant weak negative correlation. Operation time might be connected weakly with early stage of recovery. Considering this result, we might stay patients longer in the hospital; however, all patients hoped to discharge at the early stage of their recovery process and were permitted to discharge based on judgment by attending physicians on POD3. Regarding the number of resected myomas and QOL, *P*-value was significant on POD14. However, *p*-values on POD3 and POD7 were not significant. For a true negative correlation between larger number of resected myomas and postoperative QOL, we would have expected to see significant differences not in the later stage but in the early stage after LM; therefore, it is difficult for us to interpret these *P*-values in the clinical context.

As uterine fibroids' characteristics vary, the invasiveness of LM also varies. It takes longer time for difficult cases of LM. Among factors indicating the invasiveness of operations, the length of operation would best represent the degree of invasiveness of LM. Although QOL on POD3 was low after long operations, after POD7, QOL did not show significant difference, which suggests that the QOL after POD7 was not influenced by the operation time.

The main limitation of our study is the low response rate to the EQ-5D questionnaire. We cannot deny the possibility that the low response rates introduce some biases into this survey results. The number of resected myomas was larger in the group of nonresponders than the group of responders. However, there was no correlation between increase in the number of resected myomas and other operative characteristics such as prolonged operation time, increase in intraoperative bleeding and increase in weight of specimen. Therefore, we believe that there is no significant difference between two groups about their recovery processes.

As we rarely perform abdominal myomectomy, we cannot compare LM with laparotomy. However, LM is already known to be less invasive than laparotomy,[4] therefore this comparison was not necessary in our study.

We conclude that more than a half of patients undergoing LM included in our study reported full recovery of QOL after 2 weeks from their operations. Therefore, we can provide the information that most of patients undergoing LM are able to recover by POD 14.

The process of QOL recovery might be weakly influenced by the operation time on POD3. However, our results suggest that postoperative QOL seems to improve finally regardless of the operative characteristics mentioned above when LM finishing without any complications.

ACKNOWLEDGMENTS

Disclosure

References

1. Baird DD, Dunson DB, Hill MC, Cousins D, Schectman JM. High cumulative incidence of uterine leiomyoma in black and white women: Ultrasound evidence. *Am J Obstet Gynecol* 2013; **188**: 100–107.

2. Barakat EE, Bedaiwy MA, Zimberg S, Nutter B, Nosseir M, Falcone T. Robotic-assisted, laparoscopic, and abdominal myomectomy: A comparison of surgical outcomes. *Obstet Gynecol* 2011; **117**: 256–265.

3. Kalogiannidis I, Prapas N, Xiromeritis P, Prapas Y. Laparoscopically assisted myomectomy versus abdominal myomectomy in short-time outcomes: A prospective study. *Arch Gynecol Obstet* 2010; **281**: 865–870.

4. Griffin L, Feinglass J, Garrett A *et al.* Postoperative outcomes after robotic versus abdominal myomectomy. *JSLS* 2013; **17**: 407–413.

5. Ikeda S, Ikegami N, On behalf of the Japanese EuroQol tariff project. Health status in Japanese population: Results from Japanese EuroQul study. *J Health Care Soc* 1999; **9**: 83–92.

6. Maris V, Ajossa S, Guerriero S, Mascia M, Solla E, Melis GB. Laparoscopic versus abdominal myomectomy: A prospective, randomized trial to evaluate benefits in early stage outcome. *Am J Obstet Gynecol* 1996; **174**: 654–658.

7. Alessandri F, Lijoi D, Mistrangelo E, Ferrero S, Ragni N. Randomized study of laparoscopic versus minilaparotomic myomectomy for uterine myomas. *J Minim Invasive Gynecol* 2006; **13**: 92–97.

8. Holzer A, Jirecek ST, Illievich UM, Huber J, Wenzl RJ. Laparoscopic versus open myomectomy: A double-blind study to

evaluate postoperative pain. *Anesth Analg* 2006; **102**: 1480–1484.

9. Palomba S, Zupi E, Falbo A *et al*. A multicenter randomized, controlled study comparing laparoscopic versus minilaparotomic myomectomy: Reproductive outcomes. *Fertil Steril* 2007; **88**: 933–941.

10. Kikchi I, Takeuchi H, Shimanuki H *et al*. Questionnaire analysis of recovery of activities of daily living after laparoscopic surgery. *J Minim Invasive Gynecol* 2008; **15**: 16–19.

Supporting information

Additional Supporting Information may be found in the online version of this article at the publisher's web-site:

Appendix S1. A conversion table of Euro-QOL 5 dimension score in Japan