

Patients' quality of life after laparoscopic or open cholecystectomy*

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Abstract: Objective: This study was aimed at evaluating and comparing the quality of life in patients who underwent laparoscopic and open cholecystectomy for chronic cholecystolithiasis. Methods: The study included 25 patients with laparoscopic cholecystectomy (LC group) and 26 with open cholecystectomy (OC group). The quality of life was measured with the Gastrointestinal Quality of Life Index (GLQI) preoperatively, thereafter regularly at 2, 5, 10 and 16 weeks after the operation. Results: The mean preoperative overall GLQI scores were 112.5 and 110.3 in LC and OC group respectively ($P>0.05$). In the LC group, the mean overall GLQI score reduced slightly to 110.0 two weeks after the operation ($P>0.05$). The LC group showed significant improvement in overall score and in the aspects of symptomatology, emotional and physiological status from 5 to 16 weeks postoperatively. In the OC group, the GLQI score reduced to 102.0 two weeks after surgery ($P<0.05$). Significant reductions were shown in the aspects of symptomatology, physiological and social status. The GLQI scores returned to the preoperative level of 115.6 ten weeks after the operation ($P>0.05$). The patients experienced significant improvements of GLQI sixteen weeks after OC operation ($P<0.01\sim 0.05$). Within the 10 postoperative weeks, the LC group had significantly higher GLQI scores than the OC group ($P<0.05$). Conclusions: LC can improve the quality of life postoperatively better and more rapidly than OC. The assessment of quality of life assessment is a valid method for measuring the effects of surgical treatment.

Key words: Quality of life, Laparoscopic surgery, Cholecystectomy

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INTRODUCTION

Cholecystolithiasis is one of the most common surgical diseases. Quality of life (QOL) is a concept reflecting physical, social, and emotional attitudes. QOL assessment serves as a more complete and powerful tool for assessing and explaining the outcomes of disease and surgical treatment (Tang and Wang, 1994; Troidl *et al.*, 1997). Although laparoscopic cholecystectomy (LC) has been widely accepted in recent years for the treatment of cholecystolithiasis (Kum *et al.*, 1996), little is known about the subjective clinical results and QOL of this less invasive surgery (Slim *et al.*, 1997). In this study, we evaluated and compared the QOL of patients who underwent LC and open cholecystectomy (OC) for cholecystolithiasis.

MATERIALS AND METHODS

Patient selection

A total of 58 consecutive cases of hospitalized patients with cholecystolithiasis and chronic cholecystitis in our department were enrolled in this study. The patients were divided into 2 groups based on the order of admission and on the patients' preference for LC or OC. The patients themselves or their close relatives were able to read and understand the questionnaires correctly. Fifty-one patients completed the questionnaires, including 25 cases with LC and 26 with OC. Seven patients with incomplete follow-up were excluded from the study (Table 1). There were no significant difference in these two groups with regard to the constituent ratio of age, sex and preoperative quality of life (Tables 1 and 2). No serious complications occurred in these patients after operation.

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Assessment of the QOL

QOL was evaluated by using Gastrointestinal Life Quality Index (GLQI), specifically designed to assess the quality of life of patients with gastrointestinal disorder. It consists of 36 items grouped into five categories (emotional and mental status, physical functioning, social activities, symptoms, treatment reaction), scored on a five point Likert scale with a range from 0 (most negative) to 4 (most positive). The full scores were 144 points and 121–125 points for normal people (Eypasch *et al.*, 1995; Testa and Simonson, 1996). The assessment was carried out preoperatively and then 2, 5, 10 and 16 weeks after the operation respectively. The hospitalized patients completed the questionnaire in the ward within 8 h. Most discharged patients were followed up by letters, while 6 patients were evaluated in the out-patient setting. Postoperative pain was measured by asking patients' feeling once a day for 2–5 d until the pain disappeared.

Statistics analysis

The GLQI score was expressed as mean±standard

deviation (SD). Comparisons of the quality of life index were tested with Mann-Whitney *U* test, *P* less than 0.05 was accepted as indicating statistical significance. SPSS 10.0 software was used for statistics analyses.

RESULTS

Preoperative GLQI scores of the patients

The mean preoperative GLQI score was 112 and 110 in the LC and OC groups respectively (*P*>0.05, Table 2). The main factors affecting the quality of life were as follows: Symptoms including epigastric fullness, abdominal pain, anorexia, disturbed physical functions including reduced physical strength, fatigue and mental problems including sadness and nervousness. In addition, most of the patients had some limitation in work ability.

Changes of the postoperative GLQI scores

Two weeks after the operation, the mean GLQI score of the LC group patients decreased slightly to

Table 1 Fifty-one patients' general clinical data

| Group | Patient (n=51) | Mean age (year) | Sex | | Mean preoperative GLQI score ($\bar{x}\pm s$) |
|-------|----------------|-----------------|------|--------|---|
| | | | Male | Female | |
| LC* | 25 | 41 | 8 | 17 | 112.5±11.0 |
| OC | 26 | 45 | 10 | 16 | 110.3±11.0 |

*Compared with OC group, no significant difference in the constituent ratio of age, sex and preoperative quality of life, *P*>0.05

Table 2 Changes of the postoperative GLQI (score, $\bar{x}\pm s$)

| GLQI score | Preoperative | Postoperative 2 weeks | Postoperative 5 weeks | Postoperative 10 weeks | Postoperative 16 weeks |
|-----------------------------|--------------|-------------------------|---------------------------|--------------------------|--------------------------|
| Global GLQI score | | | | | |
| LC group | 112.5±11.0* | 109.6±14.3** | 118.9±12.0** ^Δ | 124.3±10.1** | 125.2±9.7* ^{ΔΔ} |
| OC group | 110.3±11.0 | 102.0±10.9 ^Δ | 108.5±11.9 | 115.6±13.8 ^Δ | 123.3±10.1 ^{ΔΔ} |
| Symptoms | | | | | |
| LC group | 63.4±6.2* | 60.9±7.4 | 65.5±5.8** ^Δ | 68.6±5.6** ^{ΔΔ} | 67.8±5.3* ^{ΔΔ} |
| OC group | 64.2±5.6 | 61.1±4.8 ^Δ | 62.5±5.3 | 62.9±6.8 | 67.8±5.8 ^Δ |
| Social activities | | | | | |
| LC group | 12.3±2.8* | 11.1±1.9** | 12.4±1.4** | 13.0±1.1 | 13.1±1.1* |
| OC group | 10.8±3.0 | 7.6±3.1 ^Δ | 9.7±2.2 | 11.8±2.0 | 14.0±1.2 |
| Physical function | | | | | |
| LC group | 18.2±3.8* | 17.8±4.8** | 17.3±2.3 | 20.6±3.6 ^Δ | 21.6±4.1* ^{ΔΔ} |
| OC group | 17.5±4.5 | 14.9±4.4 ^Δ | 16.7±5.0 | 20.0±4.7 ^Δ | 20.7±4.0 ^{ΔΔ} |
| Emotional and mental status | | | | | |
| LC group | 15.7±2.8* | 16.6±2.4** | 17.3±2.3 ^Δ | 18.0±1.7 ^{ΔΔ} | 18.3±1.3* ^{ΔΔ} |
| OC group | 14.4±2.9 | 15.2±2.2 | 16.5±2.4 ^{ΔΔ} | 17.0±2.4 ^{ΔΔ} | 17.5±2.3 ^{ΔΔ} |

*Compared with OC group, *P*>0.05; **Compared with OC group, *U*=101.5~210.0, *P*<0.05; ^ΔCompared with preoperative, *U*=190.0~229.5, *P*<0.05; ^{ΔΔ}Compared with preoperative, *U*=89.5~196.5, *P*<0.01

110±2 points ($P>0.05$), compared with preoperative GLQI score. Analysis of each aspect of the QOL showed that there was no difference between pre- and postoperative GLQI scores in the aspects of symptoms, physical functioning and social activities ($P>0.05$). The mean GLQI scores of OC group patients was 102, decreased by 8 points, compared with preoperative score ($P<0.05$). The GLQI was reduced significantly, in the aspects of symptoms, physical functioning and social activities ($P<0.05$), while the scores slightly increased in the aspects of emotional and mental status ($P>0.05$, Table 2). In this period, the mean global GLQI score and the scores of physical functioning, emotional and mental status and social activities in the OC group were significantly lower than these in the LC group ($P<0.05$, Table 2). The score of symptoms in two groups were similar ($P>0.05$). But 80% of patients in the OC group had severe incisional or abdominal pain for 1–5 d. Most patients needed opioid analgesics or patient-controlled analgesia (PCA), while 56% of patients in the LC group had mild or moderate pain for 1–3 d, 11 of who needed no-opioids analgesics. As the indication for analgesics was not uniformly established, no statistical analysis was performed for the pain evaluation.

Five weeks after the operation, the GLQI scores of the LC group patients improved significantly, as compared with the preoperative baseline ($P<0.05$, Table 2). The GLQI scores of the OC group patients were still similar to the preoperative level ($P>0.05$). The GLQI score increased significantly in emotional and mental status ($P>0.05$), and slightly in other aspects ($P>0.05$) in both LC and OC groups. In this period, the LC group GLQI score stayed significantly higher than that in the OC group ($P<0.05$), mainly in the aspects of symptoms and social activities. The LC group patients had less digestive symptoms and could return to routine work and social activities better than the patients in OC groups ($P<0.05$, Table 2).

Ten weeks after the operation, the GLQI scores of the LC group patients increased continually and were significantly higher than the preoperative baseline ($P<0.01$). In this period, the patients improved their QOL in the aspects of subjective symptoms, emotional and mental status and physical functioning improved significantly ($P<0.05$), but there was no obvious improvement of QOL in the aspect of social

activities ($P>0.05$). The GLQI scores of the OC group patients had exceeded the preoperative level ($P<0.05$), especially, in the aspects of emotional and physiological status ($P<0.05$). The LC group GLQI score was still higher than that in the OC group ($P<0.05$), particularly in the aspect of the digestive symptoms ($P<0.01$, Table 2).

Sixteen weeks after the operation, the GLQI scores of the LC group patients were similar to these 10 weeks after the operation ($P>0.05$). The GLQI scores of the OC group patients exceeded the preoperative level significantly as well ($P<0.01$). The improvement involved all aspects of GLQI except social status ($P<0.01\sim 0.05$). In this period, mean global score and the scores in every aspect between LC and OC groups had no difference ($P>0.05$, Table 2).

DISCUSSION

Quality of life and measurement

The World Health Organization defined health as “a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity” (Testa and Simonson, 1996). This definition represented a departure from defining health solely in terms of death and disease. Testa and Simonson (1996) defined QOL as the “physical, psychological and social domains of health, seen as distinct areas that are influenced by a person’s experiences, beliefs, expectations and perceptions”. An international group of investigators suggested seven fundamental dimensions of QOL: (1) Symptoms and signs of a disease, (2) physical functioning, (3) psychological functioning, (4) social functioning, (5) role activities, (6) overall life satisfaction, and (7) perceptions of health status (Paul and Bouillon, 1997). Karnofsky Performance Status and Spitzer Quality of Life Index are generic instruments commonly used to evaluate the general and overall QOL of patients (Trold et al., 1997). These generic instruments provide a larger context to assess QOL, but may be insensitive to specific impairments imposed by particular illnesses (Tang and Wang, 1994; Borgaonkar and Irvine, 2000). In this study, we choose the Gastrointestinal Quality of Life Index (GLQI), which is a disease-specific scale developed by Eypasch and colleagues to measure QOL in patients with gastro-

intestinal disease (Eypasch *et al.*, 1995). It has been used in Europe and North America and confirmed to be a useful tool with satisfying validity, reproducibility, reliability and sensibility (Eypasch *et al.*, 1995; Borgaonkar and Irvine, 2000). The present study showed that the GLQI could effectively evaluate the pre- and postoperative quality of life in patients who underwent laparoscopic and open cholecystectomy.

Quality of life and surgery

Surgical operation, as a traumatic treatment procedure, could affect QOL of the patients as well as treating them (Earlam *et al.*, 1996). Therefore, surgeons should try their best to improve patient's QOL in addition to focusing on the more traditional outcomes of mortality, morbidity, and laboratory findings. In a randomized controlled clinical trial (Lottman *et al.*, 2004) to assess QOL outcomes after endovascular versus open abdominal aortic aneurysm repair, Lottman *et al.* (2004) found that there was significant benefit for the endovascular group 1 month after operation in the physical functioning, role limitations caused by physical problems, vitality, and pain. Our previous study (Chen *et al.*, 2000) showed that in patients who underwent hepatectomy for liver cancer, the GLQI score returned to the preoperative level 16 weeks after the operation. For this reason, on the premise of treatment, attenuating the tissue injury is the important measure to minimize the adverse effect of operation and reduce complications.

Because of its minimally invasive technique, LC gained wide acceptance and rapidly became the treatment of choice for gallstone disease and cholecystitis. But, few data are available to document the impact of the procedure on patients' QOL (Slim *et al.*, 1997). In fact, QOL is an important measure of the outcomes of minimally invasive surgery. Because the minimally invasive technique should have the advantage of improved subjective well-being for patients, such as less postoperative pain, etc. The present study indicated, that QOL improved earlier and better after laparoscopic surgery compared to open surgery for cholecystolithiasis. Compared with OC, LC results in less operative trauma and physiological impairment to patients and contributes to rapid postoperative recovery and QOL improvement.

In this study, emotional well-being was less impaired during the investigation, and the impairment

in emotion could be improved rapidly after the operation. This is associated with the confidence of the patients in their doctors and nurses, good nursing and the solicitous attendance of family members. It suggested that clinicians should recognize the importance of the emotional aspects of QOL. Maintaining and improving the emotional health can positively affect the clinical course and the postoperative recovery of the patients.

References

- Borgaonkar, M.R., Irvine, E.J., 2000. Quality of life measurement in gastrointestinal and liver disorders. *Gut*, **47**(3):444-454.
- Chen, L., Chen, C.C., Huang, H., Zheng, Y.X., Peng, S.Y., 2000. Quality of life in surgically treated patients with liver cancer. *Chin J Hepatobiliary Surg*, **6**(6):430-432 (in Chinese).
- Earlam, S., Glover, C., Fordy, C., Burke, D., Allen-Mersh, T.G., 1996. Relation between tumor size, quality of life, and survival in patients with colorectal liver metastases. *J Clin Oncol*, **14**(1):171-175.
- Eypasch, E., Williams, J.I., Wood-Dauphinee, S., Ure, B.M., Schmulling, C., Neugebauer, E., Troidl, H., 1995. Gastrointestinal quality of life index: Development, validation and application of a new instrument. *Br J Surg*, **82**(2):216-222.
- Kum, C.K., Eypasch, E., Lefering, R., Paul, A., Neugebauer, E., Troidl, H., 1996. Laparoscopic cholecystectomy for acute cholecystitis: Is it really safe. *World J Surg*, **20**(1):43-49.
- Lottman, P.E., Laheij, R.J., Cuypers, P.W., Bender, M., Buth, J., 2004. Health-related quality of life outcomes following elective open or endovascular AAA repair: A randomized controlled trial. *J Endovasc Ther*, **11**(3):323-329.
- Paul, A., Bouillon, B., 1997. Developing a Measuring Instrument. In: Troidl, H., McKneally, M.F., Mulder, D.S., Wechsler, A.S., McPeck, B., Spitzer, W.O. (Eds.), *Surgical Research*. 3rd Ed., Springer, New York, p.293-302.
- Slim, K., Bousquet, J., Kwiatkowski, F., Pezet, D., Chipponi, J., 1997. Analysis of randomized controlled trials in laparoscopic surgery. *Br J Surg*, **84**(5):610-614.
- Tang, D.L., Wang, S.B., 1994. Measurement and application of the quality of life. *Natl Med J China*, **74**(3):175-179 (in Chinese).
- Testa, M.A., Simonson, D.C., 1996. Assessment of quality-of-life outcomes. *New Engl J Med*, **334**(13):835-840.
- Troidl, H., Wechsler, A.S., McKneally, M.F., 1997. How to Choose Relevant Endpoints. In: Troidl, H., McKneally, M.F., Mulder, D.S., Wechsler, A.S., McPeck, B., Spitzer, W.O. (Eds.), *Surgical Research*. 3rd Ed., Springer, New York, p.303-320.