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Laparascopic colon resection for cancer: evidence based results

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About 90-92% of patients with carcinoma of the colon are treated surgically. For other surgeons, laparoscopic surgery for the treatment of malignancies remains controversial because of concerns about the adequacy of lymphadenectomy, the extent of resection, early findings of port-site metastasis and the lack of data on long-term results. In our experience, there are no differences between the laparoscopic and laparotomic techniques, and only advantages if the laparoscopic technique is use correctly. We essentially agree with the good results of many studies published in the last ten years, but we are extremely confident that it is necessary to have a good learning curve and a high-volume cases hospital to obtain good results through a laparoscopic approach. So laparoscopic colorectal surgery should be performed only by surgeons who have completed training in this approach and who perform the procedure often enough to maintain a good level of competence.

Abbreviations:
RCT: Randomized Controlled Trials
COST: Clinical Outcomes of Surgical Therapy
LCS: Laparoscopic colorectal surgery
OCS: Open Colorectal Surgery
CRC: colo-rectal cancer
OR: odds ratio

Key words: Colon cancer, Malignancy, Laparoscopic Colorectal Surgery., Laparoscopy.

INTRODUCTION

Colon cancer, is a major health problem in the West Country and surgery represent primary treatment. About 90-92% of patients with carcinoma of the colon are treated surgically[1].

Today, for many surgeons laparoscopic surgery is the best approach for left colon cancer treatment[2,3,4,5]. For other surgeons, laparoscopic surgery for the treatment of malignancies[6] remains controversial because of concerns about the adequacy of performing a lymphade-nectomy, the extent of resection, early findings of port-site metastasis and the lack of data on long-term results.

Several studies demonstrate that the reduction in surgical trauma rendered by using laparoscopic colon surgery is associated with better pulmonary function, less stress response and earlier return of bodily functions[8,9]. The post-operative time is shorter than in open surgery, especially if it is associated with a fast-track program[10,11].

We have reviewed most important clinical studies of laparoscopic surgery versus open surgery for colon ca-ncer, with the aim to understand whether laparoscopic approach is acceptable or not for colon cancer treatment.

SHORT-TERM OUTCOMES

In a recent Cochrane meta-analysis on short-term outcome after laparoscopic colorectal surgery, a laparoscopic approach was found to be associated with increased operating time and less intraoperative blood loss compared to open surgery. Furthermore, postoperative pain was less, duration of postoperative ileus shorter, pulmonary function improved, morbidity decreased, and quality of life in the first month was better after laparoscopy compared to open surgery[12].The authors concluded that if long term outcome of laparoscopic and open procedures showed equivalent results, the laparoscopic approach should be preferred in colorectal cancer surgery.

Other randomized controlled trials compare laparoscopic surgery with open surgery for colon cancer, from 1991 to 2007[4,13,14-24]. The rate of conversion to open surgery varied from 0 to 46.4% between those studies. There were no significant differences in overall and su-rgical complication rate, anastomotic leakage rate, reo-peration rate and oncological clearance. Prospective ra-ndomized controlled trials show that laparoscopic surgery for colon cancer is feasible, safe and has many short-term benefits as a significantly lower mortality, less blood loss, reduced post-operative pain scores and reduced requirements for

narcotic analgesia. Patients passed flatus earlier and had bowel movement earlier and resumed oral diet sooner than the patients did in open surgery.

LONG-TERM OUTCOMES

Only four randomized controlled trials (RCTs) have been reported to clarify long-term outcome of laparoscopic surgery for colon cancer1[3-16,25]. These trials were evaluated in the survival, mortality and recurrence of disease associated with two types of surgical procedures with follow-up period of 3.6-5 years. These trials reported an overall mortality rate of 17.9-32% for laparoscopic surgery and 22.2 –61% for open surgery. The Clinical Outcomes of Surgical Therapy (COST) Group in USA[15,25], Leung et al.[16] and MRC CLASSICC[13] demonstrated that overall survival rate and the recurrent cancer rate were similar after laparoscopic and open surgery. Only Lacy et al.[14] described significant differences between two surgical methods. In this trial, cancer-related mortality was lower in patients (probably few cases) with Stage III disease who underwent LCR, and no significant differences were found with respect to patients with Stage I and II disease.

Transatlantic laparoscopically assisted versus open-colectomy trials study group also reported that meta-analysis demonstrated no significant difference in terms of long-term survival between both surgical procedures[26]. Prospective randomized controlled trials and meta-analysis in terms of long-term outcome states that there are no differences in the two surgical procedures. However, these randomized controlled trials in western countries also have several problems such as the criteria including early staged cancer and benign disease, undetermined level of lymph node dissection, unclear indication for adjuvant chemoradiotherapy and no description of quality control of the two surgical procedures.

A recent meta-analysis confirm all previous data[27]. Of 4,207 patients in 15 RCTs, 2,126 patients were allocated to the (Laparoscopic colorectal surgery) LCS gro-up and 2,081 patients to the (Open Colorectal Surgery) OCS group.

Eleven studies compared the overall complication after laparoscopic and open surgery for colorectal cancer (CRC) with 2,603 patients included in the meta-analysis. The overall complication rate was 16.1% in the laparoscopic group and 21.1% in the open surgery group, showing that the overall complication in the OCS surgery group was significantly higher than that in the LCS group for CRC; the OR was 0.71 (95% CI, 0.58–0.87, P =0.001)

The overall recurrence rates were 17.4 and 18.1% in the LCS group and OCS surgery group, respectively, showing no significant difference in the OR for overall recurrence between the open surgery and laparoscopic groups for CRC; the OR was 0.92 (95% CI, 0.77–1.11, P = 0.34)

The local recurrence rates were 6.0 and 7.0% in the laparoscopic group and open surgery group, respectively, showing in 10 studies showed no significant difference in the OR for local recurrence between the open surgery and laparoscopic groups for CRC; the OR was 0.81 (95% CI, 0.59–1.12, P = 0.20)

The distant metastasis rates were 13.7 and 13.8% in the laparoscopic group and open surgery group, respectively.

The wound-site recurrence rates in the LCS group and OCS surgery group were 0.81 and 0.32%, respecti-vely; the OR was 1.97 (95% CI, 0.77–5.02, P = 0.16).

About colon cancer-related mortality after laparosco-pic and open surgery, 1,800 patients were available to calculate the OR. The colon cancer-related mortalities were 17.7 and 19.7% in the laparoscopic group and open surgery group, respectively, with no significant difference in the OR for the colon cancer-related mortality between the two groups.

The Authors of this meta-analysis report that it is an evidence-based study including almost all reported RCTs. They also sustain that although other systematic reviews comparing LCS and OCS for CRC have been performed [28,29], the results of their study are more convincing because of its large sample size.

They conclude, furthermore, that it is also an important confirmatory finding that provides support for the laparoscopic approach in terms of long-term survival. Also other Authors, in COLOR trial[30], conclude that the difference in disease-free survival between groups was small and, they believe, clinically acceptable, justifying the implementation of laparoscopic surgery into daily practice.

DISCUSSION

We are essentially agree with the conclusion of these important meta-analysis but we are extremely confident that it is necessary to have a good learning curve and a high-volume cases hospital to obtain good results through a laparoscopic approach.

For example, the COLOR trial[31] reported a 17% conversion rate and divided outcomes as as low, medium and high volume[32] based on the following case numbers: fewer than 5 cases per year, 5–10 cases per year, and more than 10 cases per year. The "high volume" institutions reported a 9% conversion rate compared with 24% rate at both the low and medium volume institutions. In the same way, a report from Taiwan group[4] most likely reflects current experience and ability with a commendable conversion rate of only 2.8%.

Once more, the COLOR study did, however, show significant differences in lymphadenectomy in subgroups of the laparoscopic arm[32], with an adequate lymph node harvest of a mean of 12 nodes in the high volume institutions versus institutions with low volume (lymph node harvest 9) and medium volume (8 lymph nodes).

About post-operative complication, the Barcelona study[14] actually demonstrated a statistically significant reduction from 28.7% in the open arm to 10.8% in the laparoscopic arm. This again may reflect the expertise of that group, as the COLOR case volume study[32] demonstrated a significant reduction in the rate of postoperative complications in medium and high volume institutions compared with low volume hospitals. As indicated in Liang's study, the range of recurrence following LCS relates to the fact that this approach is a surgeon-and instrument-dependent technique that is subjected to inadequate vascular dissection, poor establish-ment of laparoscopic anatomy, inade-

quate bleeding control, and also water irrigation during the operation[4].

In conclusion, laparoscopic surgery for the treatment of malignancies remains controversial in some countries because of concerns about the adequacy of performing a lymphadenectomy, the extent of resection, and the seeming lack of data on long-term results. In our experience, there are no differences between the laparoscopic and open approach, and only advantages if the laparoscopic one is use correctly. However, to obtain the same results, laparoscopic colorectal surgery should be performed only by surgeons who have completed training in this approach and who perform the procedure often enough to maintain a good level of competence.

SUMMARY

LAPAROSKOPSK RESEKCIJA KOLONA ZBOG KARCINOMA: REZULTATI ZASNOVANI NA ČINJENICAMA (EVIDENCE BASED)

Oko 90-92% pacijenata sa karcinomom kolona su hirurški lečeni. Za mnoge hirurge laparoskopska hirurgija maligniteta ostaje kontraverzna zbog brige o adekvatnosti limfadenektomije, obima resekcije, ranih nalaza metastaza na mestu porta, i nedostatku podataka o dugotrajnim rezultatima. Naše iskustvo pokazuje da nema razlike izmedju laparoskopske i laparotomijske tehnike pod uslovom da se koristi pravilna laparoskopska tehnika. Esencijalno se slažemo sa dobrim rezultatima mnogih studija objavljenih u poslednjih deset godina, ali smo ubedjeni da mora postojati krivulja učenja (learning curve) i velik broj pacijenata da bi se postigli dobri rezultati laparoskopskim pristupom. Prema tome laparoskopska kolorektalna hirurgija bi trebala da bude radjena od strane hirurga koji su završili trening i koji dovoljno često izvode ovu proceduri da bi se smatrali sposobnima da uspešno izvode ovu proceduru.

Ključne reči: laparoskopska hirurgija, karcinom

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