Initial results of reduced port laparoscopic gastrectomy for gastric cancer

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Introduction

Recent improvements of laparoscopic surgery enable to progress their technical maturity and their instruments. The laparoscopic surgery is indicated for the majority of the gastro-intestinal disease in their early stage of cancers. By the progress in their adaptation for the gastro-intestinal disease, we re-notice that the cosmetic superiority make the patients be happier for the life after the surgery.

Operative procedure

In our operative procedure, as the conventional laparoscopic gastrectomy (LG), we used three 12 mm, two 5 mm trocars and Nathson's liver retractor. For the retraction of the resected specimens, we opened 3–4 cm at the umbilicus and covered the specimens in the tissue bag.

Results

In our series, there is one case of hemostat during LG in...
Reduced port laparoscopic gastrectomy (RPLG) from 2012 to 2014 took the same operation time and blood loss as the conventional our LG (Table 1).

But the surgeon felt much stress to manipulate the tissues during the surgery.

### Discussion

From the report in the meeting of 3rd Reduced Port Surgery Forum 2014 in Fukui (Figure 4), the procedures of RPLG were performed by two ways (1). The one was the using multi-channel ports device in the umbilicus. And the other way was using needle devices to reduce the ports of the surgery.

In the symposium of reduced port gastrectomy with lymphadenectomy for gastric cancer patients, the 317 RPLG cases from the five expert surgeons were reported. They include 75 of single port gastrectomy (Table 2). The results were not inferior in the bleeding, the number of resected lymph nodes, or intra- and post-operative complications than the conventional LG. One surgeon reported the much longer time in RPLG than conventional method.

All speakers reviled the better cosmetic result than the conventional method, as the feasible procedure for the skilled surgeons in spite of the difficulty of the procedures.

In our series, same results were revealed even in the small number of the cases. We also used multi-channel device at the umbilicus and needle devices in addition to

### Table 1 Results of RPLG in our series

<table>
<thead>
<tr>
<th>Surgery</th>
<th>Number of cases</th>
<th>Procedure [DG(R-Y)/DG(B-1)/PG(D-T)/TG]</th>
<th>Median operative time (min) [range]</th>
<th>Median blood loss (g) [range]</th>
<th>Multi-channel-port device</th>
<th>Needle device</th>
<th>EndoGrab™</th>
<th>EndoLift™</th>
</tr>
</thead>
<tbody>
<tr>
<td>LG</td>
<td>61</td>
<td>41/10/7/3</td>
<td>377 [185–585]</td>
<td>70 [0–500]</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

EndoGrab™, intra-corporeal tissue hanging device instead of grasper; EndoLift™, intra-corporeal liver hanging device as liver retractor; DG(R-Y), distal gastrectomy with Roux-en-Y reconstruction; DG(B-1), distal gastrectomy with Billroth-1 reconstruction; PG(D-T), proximal gastrectomy with Double-tract reconstruction; TG, total gastrectomy; RPLG, reduced port laparoscopic gastrectomy.
the hanging devices into the peritoneal cavity to reduce the surgical port.

The most important point in the reduced port surgery is the quality control as the results of the surgery. However, the approach to reduce the trocar in the setting of the surgery makes reduce the cosmetic and psychological invasion for the patients. The principle of the surgery is to save the patient from the disease, so we must never reduce the quality of the surgery in any procedures.

From the results of reported cases and our series, the gastrectomy with lymphadenectomy was performed safely as the conventional LG. But there are some important matters on this results that are the immature data by small number of series and short observed period. Moreover, the procedures will not be indicated commonly, because the procedures were performed by the skilled surgeons and the teams. To indicate RPLG for much wider institute, we have to plan to educate the procedures as the conventional laparoscopic surgery as the one of the advanced course of procedures.

Through these processes, recent presentations could show the skilled team and would initialize the RPLG safely. However, the feasibility will be improved with the time course. By the improved skills and the instruments, we have to point out the current problems to proceed the RPLG procedures.

Recent publications about RPLG also revealed the results of retrospective studies that there was no significant difference between RPLG and conventional LG in operating time, blood loss, number of nodes dissected, morbidity, or hospital stay. All of those are from expert surgeons (2-8). But the part of them might have some sample bias, for example, obesity of the patients (5). The indication for RPLG would be suitable for not obese patients in the current results.

There are three problems for the reduced port surgery. The first is the suitable instruments and their innovation. The second is technical difficulty for the operation itself. And the third is the education for the surgical skills. The third problem is the most important for this field. So, we had the surgical meetings of reduced port surgery for the improvement, the skills, devices, and the education. The problem might be solved by the standardized procedure of the laparoscopic surgery with the reduced port settings.

![Figure 4](image)

**Figure 4** The poster of the meeting: 3rd Reduced Port Surgery Forum 2014 in Fukui.

<table>
<thead>
<tr>
<th>Number</th>
<th>Presenter</th>
<th>Number of cases</th>
<th>Multi-channel-ports devices</th>
<th>Needle devices</th>
<th>Comparison vs. LG (bleed/operative time/number of nodes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>K. Shibao</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>Same/same/same</td>
</tr>
<tr>
<td>2</td>
<td>R. Takagawa</td>
<td>126</td>
<td>126</td>
<td>0</td>
<td>Same/longer/same</td>
</tr>
<tr>
<td>3</td>
<td>T. Urushihara</td>
<td>77</td>
<td>77</td>
<td>0</td>
<td>Same/same/–</td>
</tr>
<tr>
<td>4</td>
<td>N. Inaki</td>
<td>39</td>
<td>39</td>
<td>39</td>
<td>Same/same/same</td>
</tr>
<tr>
<td>5</td>
<td>K. Omori</td>
<td>45</td>
<td>45</td>
<td>0</td>
<td>Same/same/same</td>
</tr>
<tr>
<td></td>
<td>Number of total cases</td>
<td>317</td>
<td>317</td>
<td>69</td>
<td></td>
</tr>
</tbody>
</table>

RPLG, reduced port laparoscopic gastrectomy; LG, laparoscopic gastrectomy.

Table 2 Presentations in Symposium 1 of RPLG in 3rd Reduced Port Surgery Forum 2014 in Fukui. Each data shows the number of cases respectively including the number of cases performed single-port laparoscopic gastrectomy.
Conclusions

Reduced port surgery is one of the desirable progressions in the laparoscopic surgery. We have to progress and indicate it with safe for the future patients.

Acknowledgements

None.

Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

References


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