Surgical treatment of rectal cancer has undergone great technical refinement after the merger of total mesorectal excision (TME), first proposed by Heald in 1982. One of the main benefits attributed to TME was the dramatic reduction in local recurrence rates associated with surgical treatment, since the TME promotes the resection of the rectum with all the perirectal fat containing lymph-vascular tissue.

Although the first case series of laparoscopic colorectal operations published in 1991 have presented patients with colorectal adenocarcinoma underwent laparoscopic resection, the possibility of treatment of colorectal cancer by laparoscopy remained a source of controversy until recently, when published the first major randomized prospective studies showing equivalence between the oncological results comparing laparoscopic surgery with conventional surgery. Thus, it was confirmed that it is possible - through minimally invasive - perform resection with satisfactory oncological criteria, with adequate lymphadenectomy, without increased risk of implants in the regions of the trocars and five-year survival was statistically similar to that obtained by conventional surgery. Therefore, with equal benefit of radical oncological standpoint, it is still possible to obtain the other advantages associated with the use of laparoscopy, such as: less blood loss, lower rate of hospital stay,
early return to activities and lower rate infection\textsuperscript{3,5,20,23}. However, these studies have several criteria for selection of patients and almost always do not include patients with adenocarcinoma of the extraperitoneal rectum. Thus, although the surgical treatment of rectal cancer by laparoscopy with performance of TME is feasible\textsuperscript{4,24} and come running in many centers, further scientific validation through prospective and randomized, in particular as regards to long-term oncological outcome.

The aim of this study was to review literature on the evidence available that compare surgical outcomes between laparoscopic vs conventional TME.

**METHODS**

Was consulted the databases available through Medline/Pubmed, SciElo and Lilacs crossing the following keywords: colorectal cancer, laparoscopic surgery.

**Results of laparoscopic TME (LTME) vs conventional TEM (CTME)**

Obtaining adequate surgical margins by performing TEM proved crucial in the treatment of extra-peritoneal rectal cancer, since the free edges - especially the radial margin (or circumferential) - were significantly correlated with lower local recurrence rates and improved survival in patients undergoing the CTME\textsuperscript{11}. Countless studies attest to the commitment rates similar to the radial margin CTME and LTME. So that Aziz, \textit{et al.}\textsuperscript{1} published a metanalysis including eight studies (n=783) that compared the subject and, in fact, no difference in the incidence of positive radial margin between the two techniques (9.5% vs 10.8% in LTME and CTME). In the same metanalysis evaluating 18 studies, was observed no difference between the number of lymph nodes per specimen in both surgeries. These data indicate that it is possible to do LTME with the same oncological radicalism that CTME\textsuperscript{1}, at least with respect to the surgical specimen obtained, since there are still no randomized prospective studies that compare the incidence of local recurrence and survival in patients submitted to both techniques.

In preliminary analysis published in 2005 of a prospective randomized English study MRC-CLASSIC\textsuperscript{8} there was also no statistically significant difference in occurrence of positive radial margin between CTME and LTME (14% vs 16%, respectively). However, although did not reach statistical significance, the occurrence of positive radial margin undergoing LTEM with sphincter preservation was higher than in the group undergoing CTME with sphincter preservation (12% vs 6%, respectively). When was compared patients who underwent sphincter preservation without TME (abdominoperineal amputation of the rectum), no difference in rates of positive circumferential margin was found between the two groups (20% vs 26% LTME and CTME).

**Local recurrence**

Practically there is no data from randomized prospective studies evaluating the occurrence of local recurrence after TME by laparoscopy. Since most studies attests to the similarity between the surgical specimens obtained by laparoscopy and by the conventional approach is not expected to find statistically significant differences in local recurrence after LTME. Among the few data available in literature, only prospective and randomized\textsuperscript{14} survival analysis of three years found no significant difference between the rates of recurrence in the group LTME (9.7%) and CTME (10.1%). Even looking only at the subgroup of patients who underwent sphincter preservation with TME, as mentioned above, the study found higher rates (without statistical significance) of positive circumferential margins in patients undergoing LTME with sphincter preservation, but there was no difference in local recurrence in these two subgroups (7.8% vs 7.0% LTME and CTME) after three years of follow-up - which may have occurred because the sample size or because of short follow-up time yet. It is necessary to await the publication of prospective randomized studies with longer follow-up and larger number of patients.

**Survival**

The same comments of the item “Local recurrence” are applicable when the focus is the comparison between survival after LTME and CTME. Data from randomized prospective studies focusing them are scarce; there is only the CLASSIC study, published in 2007 whose data refer to the survival of three years\textsuperscript{14}, and show no statistically significant differences between the two groups either with respect to overall survival and with respect to disease-free survival. When stratified by disease stage or the possibility of sphincter preservation was also not found any statistical difference between both groups.

**Urinary and sexual function**

The occurrence of urinary and sexual dysfunction is a complication of any pelvic operation, including resection of rectal cancer with TME. Even with the incorporation of autonomic preserving techniques to TME, the incidence of disorders of the urinary and sexual function varies between 0% to 12% and 10% to 35%, respectively\textsuperscript{13}. Although there is evidence that it is technically possible to preserve urinary and sexual function in patients undergoing LTME, especially the males (17), there are few publications available on the subject in the literature. In 2002, Quah, \textit{et al.}\textsuperscript{22} published a retrospective analysis of the incidence of urinary and sexual dysfunction in patients with rectal
cancer undergoing both resection and noted that: 1) there was a higher incidence of sexual dysfunction in men undergoing LTME (especially in patients with large tumors or tumors of the distal rectum); 2) there were no differences regarding urinary dysfunction between the two techniques in both men and women, and 3) there was no difference in sexual function of women. Recently, an analysis was published prospective and randomized on urinary and sexual function compared both procedures, derived from the CLASSIC study21, with similar conclusions to the study of Quah, et al:21. The LTME had no negative impact on urinary function, however there was a trend to worsening of sexual function in men but not women. This study evaluated 71.2% (247/347) of patients operated through specific questionnaires and it is certainly the best evidence available so far about this issue and identified that the implementation of TEM and the need for conversion were independent predictors of occurrence of male sexual post-surgical dysfunction.

**Conversion**

Surgical treatment of rectal cancer by laparoscopy is feasible, but the few studies available indicate high conversion rate, especially in cases of LTME with sphincter preservation19,22. CLASSIC study showed the conversion rate of 34% for cases of patients with rectal cancer treated by laparoscopic (vs. conversion rate of 25% for laparoscopic colectomy in the treatment of colon cancer)8. Specialized centers with extensive experience, conversion rates are getting smaller. For example, Prof. Rullier, France, in 2007 published their experience with 200 patients undergoing LTME with sphincter preservation, with conversion rate of 15.5%18. In this study, the risk of conversion was three times higher for male patients with mechanical colorectal anastomosis (34% vs 11% remaining patients). The fixation of the tumor was a predisposing factor for conversion. It is interesting to underline that the majority of studies indicate a significant increase in morbidity cases undergoing conversion to the conventional8,18. Therefore, knowing the predisposing factors for conversions - and seek ways to lessen them - should be the goal to be achieved by surgeons. It is believed that the improvement of laparoscopic staplers to help to reduce the need for conversions especially in male patients18.

**DISCUSSION**

After 17 years of the first publication on laparoscopic colectomy12, and years of discussions about the adequacy of oncological radicalism by laparoscopy, numerous studies and randomized ones, have demonstrated that colon cancer can be treated by curative minimally invasive with all the major benefits associated with this methodology, and overall survival equivalent to that obtained by the conventional approach (Tables 1 and 2).

<table>
<thead>
<tr>
<th>TABLE 1 - Major prospective randomized trials evaluating the treatment of colon cancer with curative intent by laparoscopy8,16,21</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Year</strong></td>
</tr>
<tr>
<td>Barcelona</td>
</tr>
<tr>
<td>COST</td>
</tr>
<tr>
<td>COLOR</td>
</tr>
<tr>
<td>CLASSIC</td>
</tr>
</tbody>
</table>

n = number of patients

<table>
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<tr>
<th>TABLE 2 - Comparison between the main results of studies on surgical treatment for colon cancer by open and laparoscopic10</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Open</strong></td>
</tr>
<tr>
<td>Age (yr)</td>
</tr>
<tr>
<td>Number of lymph nodes</td>
</tr>
<tr>
<td>Positive margins</td>
</tr>
<tr>
<td>Recurrence (local / remote)</td>
</tr>
<tr>
<td>Mortality</td>
</tr>
</tbody>
</table>

However, as can be observed by reviewing the literature available to date, it may not yet be said for the curative treatment of rectal cancer. Although countless studies have confirmed that the LTME is feasible from a technical standpoint and can produce similar results in the short term when compared with the CTME, no data with sufficient level of evidence with regard to overall survival, disease-free survival and local recurrence rates that support their systematic use. The only prospective, randomized study that evaluated these data with appropriate scientific rigor was published in 200714, with only three years of follow-up. The absence of five-year survival has been making major international companies involved with the theme, as the American Society of Colorectal Surgeons and the Society of Gastrointestinal Endoscopists not recognize the LTME as standard in the treatment of rectal cancer with curative intent, recommending its use only within service protocols in centers of excellence and extensive experience in laparoscopic colorectal operations17.

**CONCLUSION**

To date, there still remains a matter of controversy whether the treatment of rectal cancer, especially in cases of tumors located in extra-peritoneal portion, should be routinely performed by laparoscopy. There are no published data that support the achievement of LTME for the treatment of rectal cancer outside of research protocol, especially the lack of survival rates and local recurrence with at least five years of follow-up.
REFERENCES


