

Sexual and urinary functions after robot-assisted versus pure laparoscopic total mesorectal excision for rectal cancer

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Dear Editor:

Laparoscopic total mesorectal excision (LapTME) is a validated surgical technique for the treatment of rectal cancer, but the surgery is still challenging and therefore functional outcomes are uncertain. Thanks to a 3-D view, better view of the pelvic structures, and articulated instruments, robotic rectal surgery allows for finer dissection and nerve-sparing during total mesorectal excision; thus it is supposed to better preserve urinary and sexual functions versus open and laparoscopic surgery as described in some literature. The aim of this study is to compare pre-operative and post-operative autonomic function after LapTME versus robotic TME (RobTME) for mid to low rectal cancer, in a single surgeon experience.

For this purpose we compared the outcomes of the first 30 RobTME, with those of the first 30 Lap TME performed by a single surgeon between January 2009 and July 2013 at our institution. The impact of surgery on autonomic function was assessed with validated questionnaires. For sexual dysfunction, the International Index of Erectile Function (IIEF) questionnaire for males and the Female Sexual Function Index (FSFI) for females were used. For evaluation of urinary dysfunction, the International Consultation on Incontinence Male/Female Lower Urinary Tract Symptoms (ICIQ-MLUTS, ICIQ-FLUTS)

questionnaires were used. The questionnaires submitted to patients pre-operatively and at months 1, 6, and 12 postoperatively. Data were analyzed with Statistical Production and Service Solution (SPSS for Windows, SPSS Inc., Chicago, IL, USA).

Of the 30 LapTME, 26 were anterior rectal resections (ARR), 2 intersphincteric resection (ISR), and 2 abdominoperineal resection (APR), while of the 30 RobTME, 20 were ARR, 6 ISR, and 4 APR. A temporary diverting ileostomy was fashioned in 26 cases of LapTME group and in 25 of the RobTME group. With regard to the urinary function, males presented with a significant worsening of voiding symptoms 1 month after surgery in both groups ($p < 0.05$). Urinary retention after catheter removal was observed in two patients in each group. Incontinence worsened 1 month after surgery in both groups ($p < 0.05$). Nevertheless, a gradual improvement in incontinence was observed at 6 months, and at 1 year after surgery, the grade of incontinence was not statistically different when compared with the pre-operative status ($p = ns$). The analyses of urinary function in female patients showed no difference between the pre-operative and post-operative scores concerning voiding and filling symptoms, in both groups ($p = ns$). Conversely, there was a significant increase of incontinence in females in the LapTME group 1 and 6 months after surgery ($p < 0.05$ for each pair-wise comparison). Incontinence worsened also in the RobTME group after surgery, but there was a difference not statistically significant with the pre-operative score at 6 months ($p = ns$). A gradual improvement in incontinence was observed in both groups with no difference at 1 year when compared with the pre-operative status ($p = ns$). With regard to the impact of urinary symptoms on quality of life (QoL), patients experienced a worsening of QoL in the first month after surgery in both groups ($p < 0.05$). However, with improvement of urinary symptoms 1 year after

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surgery, there was an improvement in QoL and no difference was observed at 1 year after surgery vs. the pre-operative period in both groups ($p=ns$). The analysis of the IIEF questionnaire showed that sexual function and overall sexual satisfaction decreased significantly after surgery in both groups ($p<0.05$). In males, erectile function was significantly worse 1 month after surgery in RobTME ($p<0.05$), while it was significantly worse 1 and 6 months after LapTME ($p<0.05$ for pair-wise comparisons). However, 1 year after surgery, erectile function scores were comparable to pre-operative values in both groups ($p=ns$). The same occurred for orgasm. The deterioration in erectile function and orgasm was associated with lowered overall satisfaction, intercourse satisfaction, and sexual desire 1 and 6 months after surgery in both groups ($p<0.05$). However, these values improved spontaneously over time without any treatment, and 1 year after surgery, there were no differences vs. baseline ($p=ns$). In females, lubrication and pain were significantly worse at 1 and 6 months after intervention in the both groups ($p<0.05$). However, these scores increased over time, and 1 year after surgery, lubrication and pain scores were comparable to pre-operative values in both groups ($p=ns$). The same occurred for orgasm. Also in females, the deterioration in lubrication and orgasm and a painful sexual rapport were associated with lowered satisfaction, arousal, and sexual desire at 1 and 6 months after surgery in both groups ($p<0.05$). However, these values improved over time, and 1 year after surgery, there were no differences vs. baseline in both groups ($p=ns$). The comparison between the two groups for each score (pre-operatively, at 1 month, at 6 months, and at 1 year after surgery) of sexual and urinary functions showed no significant differences between LapTME and RobTME, and the two groups resulted homogeneous and both showed a similar trend of autonomic disturbs after surgery ($p=ns$).

The comparison between pure laparoscopy and robot-assisted surgery for the treatment of rectal cancer is an open issue. Sexual and urinary dysfunctions remain among the major complications of rectal surgery, with the potential to negatively impact patients' QoL. Only few studies report on functional outcomes after robotic TME with the use of standardized and validated questionnaires. In a review of Papanikolaou published in June 2014, only seven studies assessed erectile dysfunction and found the incidence of complications ranged from 0 to 36.6 % in the robotic group compared to 2.7 to 56.5 % in the laparoscopic group. Four of these studies were comparative, and two of these studies evaluated sexual and voiding function using the International Index of Erectile Function (IIEF-5) score and the International Prostate Symptom score (IPSS), respectively. In one of the main studies, D'Annibale et al. in 2013 showed a worsening of the IPSS

scores 1 month after surgery in both groups and a normalization 1 year after surgery, while erectile function was preserved in 100 % of sexually active patients in the RobTME group compared to 43 % of those in the LapTME group 1 year after surgery, with a statistically significant difference ($p=0.045$). In the study by Park et al. published in 2013, patients were asked to complete the questionnaires preoperatively and 3 and 6 months postoperatively. The laparoscopic group had a significantly higher incidence of erectile dysfunction than the robotic group. The robotic group also had a faster rate of improvement when assessed at 3 and 6 months. However, there was no difference found in terms of voiding function. Luca et al. in 2013 reported a non-comparative series of RobTME studied with validated questionnaires, showing no difference for incontinence, filling, or voiding symptoms at 1 year vs. baseline in both genders. Finally, in a recent systematic review and meta-analysis of Broholm, published in May 2015, in which only 10 studies were included, he concluded that robotic technology may improve urogenital function but that the results were not consistent. In our series, we observed a transient impairment of urinary continence, filling, and voiding after RobTME as well, with symptoms that improved over time, and 1 year after surgery, there were no differences vs. baseline, but similar results were found in the LapTME group. Concerning sexual function, we observed a worsening of erectile function and orgasm 1 month after surgery in RobTME, while in the LapTME group, these symptoms were present up to 6 months after surgery. However, symptoms improved over time, and 1 year after surgery, there were no differences vs. baseline, probably due to resolution of post-operative inflammation of pelvic tissues and repair of minimal nerve damage caused by intra-operative manipulations. Thus, in contrast to the cited studies, in our series, we found no statistically significant difference between RobTME and LapTME, as sexual function and general sexual satisfaction 1 year after surgery seem to be comparable to those before surgery, similar to how urinary symptoms were unchanged 1 year after the intervention compared with the pre-operative status in both groups. We have considered these results as a good functional outcome in both groups because of the complete recovery of autonomic functions in all patients. So if on one hand they are good for laparoscopy, we have to consider that a greater number of intersphincteric resections and Miles procedures were done in the RobTME group. Thus, considering the robotic group at greater risk of nerve lesions, these data, in our opinion, could be indirectly indicative of the superiority of a robotic approach in the preservation of autonomic functions, and no definitive conclusions can be drawn. The main limitation of our series is the small sample of patients; however, to the best of our knowledge, this is the first comparative analysis of the two techniques for this specific issue using administration analysis of validated questionnaires for both male and female sexual and

urinary function, with 1 year of follow-up. In our experience, RobTME was comparable to LapTME in terms of autonomic nerve-sparing function even when performed in a more high-risk surgery such as ISR and APR. Further studies are necessary to understand the real role of robotic surgery on this specific issue.

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