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EDITORIAL

Transanal total mesorectal excision for low and middle rectal cancer: time for audit?

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Since the introduction of transanal total mesorectal excision (TaTME) [1] for the treatment of rectal cancer, expert centers have reported very encouraging results. It appears that TaTME is becoming the new standard for surgical treatment of low and mid rectal cancer. Supposedly, TaTME provides better visualization of the area of the mid-rectum (so called "the rectal no man's land"), especially in the obese male patient, with narrow pelvis and/or bulky tumor, which allows not only better nerve preservation but also better oncological resection with a lower rate of R1 resection than standard laparoscopic TME from above. Some studies described better functional outcomes, due to the better preservation of the external sphincter and nerves.

However, some concerns have recently emerged about the safety of TaTME, due to intraoperative adverse events, short-term complications and negative long-term outcomes.

The international registry of TaTME with 1594 procedures [2] reveals that intraoperative adverse events occurred during the transanal phase in 31% of the patients and includes technical problems (18%), wrong dissection plane (6%), pelvic bleeding > 100 mL (4%) and organ injuries (urethra, rectum, vagina and bladder) (2%). Even if well-known surgeons, expert in TaTME, have at every scientific meeting report that TaTME is definitely better than laparoscopic TME, everyone has seen, in the same meetings, some nightmare videos of surgeons almost removing the prostate instead of the cancer or extending dissection too far laterally with en bloc resection of the pelvic nerves. Another intraoperative event to report is the possible occurrence of carbon dioxide embolism, first described during TaTME by Ratcliffe et al. [3]. Dickson et al., have recently reported carbon dioxide embolism in 25 out of 6375 patients (0.4%). Unplanned postoperative admission to the intensive care unit was required for 15 (60%) of these patients and postoperative complications occurred in 12 of them (48%) including 10 major complications (pelvic collections, acute renal failure, pulmonary embolism), which were managed with surgery or interventional radiology. Despite the rarity of carbon dioxide embolism, it appears to be a potentially lethal complication during TaTME [4].

TaTME is clearly challenging. As a good example of a mandatory learning curve, we have reported our preliminary experience of the 34 first TaTME, with an intraoperative complication rate of 21% (rectal ($n=4$), bladder ($n=1$) and vaginal ($n=1$) perforations) [5]. The American training program [6] reported the experience of surgeons after 2 days of cadaver-based training, highlighting the concerns of the surgical community about incorrect dissection plane, urethral injury and bleeding in 60%, 25% and 15% of cases, respectively. This cadaver-based training is considered, by Atallah et al. [6] to be insufficient to perform TaTME. Koedam et al. [7] recently reported their experience of the learning curve over the course of 138 TaTME in their first 40 patients. Major postoperative complications occurred in 48% of the patients, with a 28% leakage rate. For many authors, 40 procedures are considered to be a cutoff to appreciate an improvement in postoperative morbidity. All these papers indicate that implementation of TaTME is difficult, and a key question is: do only surgeons in high volume centers have 40 consecutive patients in a relatively short period of time [7]?

Despite the initial enthusiasm about results, the anastomotic leak rate seems also similar to what is observed after laparoscopic TME. In the International registry, anastomotic leak occurred in 15.7% [2]. This rate appears to be similar or even higher than those reported in the literature after laparoscopic TME: 13% in the COLOR II trial [8] and 10% in the CLASSIC trial [9]. A similar trend of anastomotic leak was also observed in the Dutch TaTME registry: 16.5% after TaTME versus 12.2% after laparoscopic TME [10]. Thus,

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the assumption that the leak rate will be lower after TaTME due to avoiding "dog ears" during stapled anastomosis performed from above may be wrong.

Long-term functional results are also a matter of debate. A very recent study [11] comparing TaTME and laparoscopic TME suggested that function was significantly worse after TaTME than after laparoscopic TME: patients had significantly more anorectal symptoms after TaTME, such as buttock pain ($p = 0.011$), diarrhea ($p = 0.009$), clustering of stools ($p = 0.017$) and urgency ($p = 0.032$), and the mean low anterior resection syndrome score which was worse (26.18 ± 10.32) than after laparoscopic TME (20.61 ± 14.51), although the difference was not statistically significant ($p = 0.054$). This observation suggests that the prolonged dilation of the anus by the transanal device worsens functional results, which are even altered after standard coloanal anastomosis.

Finally, and maybe most importantly, the oncological results are also a potential problem in TaTME, as suggested by the higher rate of local recurrence recently observed after TaTME versus laparoscopic TME in the Norwegian national survey. Very recently, the Norwegian health authorities declared a moratorium on TaTME, decided on after results of 110 TaTME procedures (performed in January 2015–December 2017) were evaluated [12]. After a very short median follow-up of 11 months, a local recurrence rate of 9.5% was observed after TaTME in comparison with 3.4% after laparoscopic TME. Moreover, a new pattern of local recurrence, early multifocal recurrence in the pelvic cavity and sidewalls as has been observed in this survey [12]. Long-term results of international registry of TaTME have been not yet reported and we are also waiting for the 3-year results of the Dutch survey [10].

What will be the position of experts in TaTME if for example results of the international registry are good (because they come from expert centers) and those of national Dutch survey, bad (because they come from a national survey)? In a such situation, it will probably be more reasonable to propose, as in Norway, that TaTME should at least be stopped in non-expert centers. We must certainly wait for the results of ongoing randomized trials (GRECCAR 11 and COLOR III) [13, 14] before proposing TaTME as the new standard approach for low and mid rectal cancer.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical approval This article does not contain any studies with human participants or animals performed by any of the authors.

Informed consent For this type of study formal consent is not required.

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