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Low Rectal Cancer: Challenges for the Surgeon

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Editorial

Inspite of advances in the field of surgery management Of Rectal Cancer (RC) continues to be a challenge for the surgeons. There is no controversy in the management of upper and mid rectal cancer. The difficult decision lies in deciding what to do for a low rectal cancer that lies just around the levators and sphincters. Challenges and controversies are faced for conventional Abdominoperineal Resection (APR), difficult dissection and approach, functional outcome following sphincter preservation, minimal access approach, lateral pelvic lymph node dissection and wait and watch policy after complete response to neoadjuvant therapy.

Conventional to radical APR

For decades, abdominoperineal resection has been the standard of care for low-lying RC. However the technique has not been standardized, and results are suboptimal and variable. Its association with technical difficulty of dissecting deep in the pelvis, greater Circumferential Resection (CRM) positivity, tumor perforation, high rates of tumor recurrence and poorer survival has stimulated the development of novel surgical techniques and modifications, such as Extra Levator Abdominoperineal Excision (ELAPE). It is well established that bowel perforation and tumor involvement of the CRM are strong predictors of local recurrence and survival in rectal cancer. In the distal rectum, the mesorectal tissue tapers down at approximately 2 cm above the levator ani muscles; where lesions are most commonly located and at risk of positive CRM with conventional APR. At this point, the CRM is often close to the rectal muscle tube. Thus, there is less protective tissue volume for the tumor to traverse before involving the CRM. By doing ELAPE we get a cylindrical specimen rather than a conical, therefore lesser chance of getting positive CRM and tumor perforation. Extra-levator approach has definite advantages and should be encouraged for routine practice in patients with threatened CRM.

Permanent stoma following APR is associated with compromised lifestyle, psychological, aesthetic & social problems, altered body image and many fail to adapt to changes in lifestyle. More ever CRM of less than 1 mm, whether as direct tumor extension, lymph node metastasis, or intravascular growth, should be considered as a positive margin Local failure with a margin of <1 mm has been reported to be 74% compared with 10% for a margin >1 mm. We now know that CRM is not maximized by doing an APR, unless a tumor has invaded the sphincter complex therefore we legitimately believe that the sphincter complex and the anus should not be removed unless involved in the tumor.

Sphincter preservation

Better understanding of sphincter anatomy, enhanced surgical techniques, and advances in Chemo Radiotherapy (CRT) have brought about the evolution of RC treatment from APR to Sphincter-Preserving Surgery (SPS). Infact In last 2 decades APR has fallen out of favor and sphincter preservation become first choice. In specialist center's APR reserved only for patients with sphincter involvement. Sphincter preservation has been possible due to increasing knowledge about micros. Distal intramural spread (1 cm for T1, 2 cm for T3, T4), advances in technology (Imaging resection & anastomotic technique), new transanal endoscopic and minimal access approach (laparoscopic, Robotic, TAMIS/TEMS) and downstaging the tumor by neoadjuvant therapy. There are two concerns for sphincter preserving surgery, oncological outcome and a good functional outcome. With its acceptable oncologic outcome and preservation of anal function, adaptation of Inter Sphincteric Resection (ISR) with Coloanal Anastomosis (CAA) has increased and largely replaced APR. A Japanese study group defined three types of ISRs: Total ISR is performed when the tumor has spread be yond the dentate line, and involves complete removal of the internal sphincter. Subtotal ISR is performed when the distal edge of the tumor is >2 cm from the dentate line, and involves resection of two-thirds of the internal sphincter. Partial ISR is performed when there is

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enough distal margins above the dentate line, and involves resection of only one-third of the internal sphincter. Hemilevator excision can be done for a tumor invading the levator ani muscle without external sphincter invasion. APR would be indicated for a tumor invading beyond the internal sphincter and Extralevator abdominoperineal resection for a tumor invading both the levator ani and external sphincter muscle

The introduction of the ISR technique has challenged the conventional belief that adequate fecal continence necessitates the preservation of an intact internal sphincter. Moreover, it has offered a feasible alternative for patients who would otherwise need an APR. The use of preoperative radiotherapy has been shown to have a negative impact on anal function, making ISR patients susceptible to anastomotic strictures, stool frequency, and urinary incontinence. In this regard, it is proposed that assessment of anal function be performed before planning this type of surgery, taking into account the patient's age and level of activity. Sphincter preservation in low rectal cancer has been reported to be safe from oncological point of view but what about quality of life? In terms of sexual and voiding functions, a Dutch TME trial showed overall sexual dysfunction in 76% of male patients and 62% of female patients. Voiding dysfunctions, including urinary incontinence, retention, urgency, and incomplete voiding, are known to be less severe than sexual dysfunctions, and the incidence has been reported to be >30. Anastomotic leak occurs in 15% to 18% and sepsis in 1% to 9% patients following restorative surgery. Both are associated with increased morbidity and mortality. More than 50% patients with straight coloanal anastomosis suffer from continence disorder what is called as Anterior Resection Syndrome (ARS) which may be sometimes so distressing that patient is compelled to ask for having a permanent stoma. So are we justified in preserving sphincter in every patient of low rectal cancer? Actually one has to strike the right balance between cure with and good quality of life, as overall survival does not translate to a meaningful or beneficial outcome unless there is a good QOL.

Difficult dissection

Going to another challenge for the surgeon while doing low rectal cancer surgery is difficulty in dissection especially in male patients, Obesity, narrow deep pelvis, bulky mesorectum, anteriorly placed low rectal cancer and difficult access and poor vision.

Laparoscopic surgery

Laparoscopic surgery has also some limitations. Blind/oblique stapler firing can result in too much a distal margin or too less a distal margin leading more risk of developing ARS and recurrence respectively. More than 2 firings of endo stapler also increase risk of leak.

Transanal endoscopic surgery

The drawbacks of transabdominal approach lead to development of new fashion Endoscopic Transanal techniques of dissection, Transanal Minimal Access Surgery (TAMIS), Transanal Endoscopic Micro Surgery (TEMS), Transanal Total Mesorectal Excision (TaTME) and Robotic Transanal Surgery (RTAS). Adequate distal margin is assured with transanal approach under vision. As a general guide T1 cancers without high risk factors are most suitable candidates. Other factors for suitability for TEMS include small lesions of <4 cm in size, involving less than 40% circumference, polypoidal or sessile (Ulcerated flat raised), Well/mod. Differentiated (Vs G3 G4/Signet cell), depth of invasion: Haggitt 1-3, pT1sm1 (Vs Haggitt 4, pT1sm2-3, resection margins: R0 (Vs Rx R1) and without lymphovascular invasion. We can access tumors from 5 cm to 20 cm. A consensus about the indications of TaTME was published after the Second International Transanal Total Mesorectal Excision Conference. Experts recommended TaTME in patients with the following characteristics: 1) male sex, 2) narrow and deep pelvis, 3) obesity, 4) tumor >4 cm, 5) prostatic enlargement, and 6) distorted planes caused by irradiation. However there is limited role of TEMS for T2 lesions which can be resected but need adjuvant CRT for acceptable outcome. Tumor diameter and Lymphovascular invasion increase risk of recurrence. Technical difficulty of this approach (TaTME) has been well acknowledged by early adopters of this technique. Visceral injuries during perineal dissection like urethral injuries (0.7%), bladder injuries (0.3%), vaginal perforation (0.1%), rectal tube perforations (0.3%) and bleeding from the pelvic side wall have been reported. Although TaTME is one of the most attractive and promising advancements for CR surgeons, Association of Coloproctology of Great Britain and Ireland (ACPGBI) consultant members have recommended structured TaTME training curriculum including guidance on case selection, multidisciplinary training, dry lab & cadaveric training, mentorship, and assessment. Alternative would be Pure NOTES for colorectal surgery having advantages of anus being easily accessible natural orifice with short distance to operation site, TEO system provides solid surgery platform that can easily be manipulated as required, no iatrogenic visceral injury (Viscerotomy in the bowel to be removed), no need to close viscerotomy site–incorporated in anastomosis, technique allows for in line operating but adaptable for retroflex views if required, uses currently available lap instruments and surgeons innate lap abilities.

Robotic Assisted Lap Surg (RALS) was introduced to overcome several limitations of conventional laparoscopy. These limitations are particularly relevant in highly demanding colorectal procedures, especially in the highly technically challenging pelvic dissection for mid and low rectal cancers. However Robotic surgery has also posed some challenges like; space and time consuming, being hybrid procedures (Every Robotic procedure is lap assisted, not *vice versa*), absolute reliance on biomedical engineers, no tactile feedback, assistant Surgeon-Arm twisting with the Robot, frequent trouble shooting with the instruments, cost (Acquisition +Maintenance +Consumables). Nonetheless, if costs for Robotic surgery were optimized and technology better taught and widely accepted, then robotic surgery would be able to decrease percentage of lap operations.

Lateral pelvic lymph node dissection (LPLND)

Inspite of safety/feasibility with similar onco outcome as shown by a subgroup analysis of a large multicenter cohort study from Japan, establishment of criteria to accurately predict LLN status as well as standardization of the technique of LLND is necessary in the future.

Wait watch policy

The observation that neoadjuvant CRT could induce significant tumor regression, with subsequent downstaging and downsizing of tumors, stimulated an interest in organ preservation strategies. At present, most of the evidence on the efficacy of Non Operative Management (NOM) derives from non-comparative single-arm studies. A recent propensity score matched cohort analysis has demonstrated that a sizeable proportion of patients managed non-operatively have avoided surgery and permanent colostomy without compromising oncological outcomes. In an age driven by evidence based recommendations, randomized controlled data

demonstrating oncological equivalence of NOM to radical surgery after the attainment of Complete Clinical Response (CCR) following neoadjuvant CRT is still unavailable, necessitating future trials before NOM can be incorporated into practice as an alternative to radical surgery. Complete response of the tumor- Complete Clinical Response (CCR), could be clinically evaluated in a subset of these patients by clinical and radiological methods demonstrating no tumor with histopathology showing no tumor from the scar. Habre gama (71 pts) reported 5 yr OS & DFS 100% & 92% compared 88% & 82% in non-responders with salvage TME group, but in selected group of patients. However results could not be reproduced. Renehan showed 33% re growth at 3 yrs., Os & DFS as 96 & 88% compared 87 & 8% in surgical resection group.

Conclusion

Field of MIS is going to evolve and broaden beyond our imagination with potential for wide application. What we know now to be the 'cutting edge' in MIS probably be obsolete within a decade or two. New techniques should undergo thorough, well controlled, scientific investigations to improve safety & quality of MIS. Abundance of techniques and technology should not defer our primary goal — *patients' safety*. Moreover, with the increasing importance of QOL, a tailored, individualized treatment approach is of utmost importance when taking into account oncologic and anticipated functional outcomes.