Pre-operative Assessment of Rectal Cancers

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Abstract

Colorectal cancer (CRC) is the third most common cancer and the second most common cause ofcancer-related deaths worldwide. The incidence rate of CRC is third in men and fourth in women.

KeyWords:CRC, Operative, Surgery.

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Introduction

Rectal cancer is one of the best examples of success of clinical research in the past 40 years. Total mesorectal excision (TME) alone, as opposed to blunt "pelvic rape", resulted in an increase in the 5-year cancer-specific survival rate from 38 to 68%. ***(Hajibandeh, Hajibandeh et al. 2020)(Bray, Ferlay et al. 2018).***

A major advance in the modern management of rectal cancer was the widespread application of the total mesorectal excision (TME). The TME, popularized by professor Heald in the early 1980s, entails a sharp resection in the avascular embryologic "holy plane" for en bloc removal of the cancer and surrounding mesorectum, allowing an intact mesorectal fascia (MRF) and preservation of the autonomic nerves. ***(Knol and Keller 2020).***

Application of the TME has resulted in reproducible dramatic reductions in local recurrence and improvement in disease-free and overall survival rates. Performance of a proper TME remains the main prognostic factor for disease recurrence. ***(Heald, Santiago et al. 2017).***

However, TME alone is not sufficient for locally advanced tumors—the addition of Neoadjuvant chemoradiotherapy (nCRT) can reduce local recurrence rates in curable rectal cancers and allow patients initially deemed unresectable to undergo curative resection. ***(Romesser, Wu et al. 2020).***

Neoadjuvant chemoradiotherapy will downstage 50 to 60% of patients, with 10 to 30% of patients demonstrating a pathologic complete response (pCR).There is a need to identify the locally advanced cancer patients appropriate for nCRT and good responders to therapy, to avoid over-and under-treatment. In this current era of precision medicine, technology and multidisciplinary team (MDT) input further optimize the staging, treatment strategy, and outcomes of locally advanced rectal cancer. A critical element in this evolution is imaging. ***(Smith, Paty et al. 2020).***

The current staging for rectal cancer follows the TNM (tumor, node, metastases) system from the AJCC (American Joint Committee on Cancer) Cancer Staging Manual, 8th edition, in conjunction with pathological assessment. ***(Amin, Greene et al. 2017).*** Magnetic resonance imaging (MRI) has advanced the clinical staging of locally advanced rectal cancer and has emerged as the dominant method of rectal cancer imaging. High-resolution T2-weighted imaging (T2WI) MRI is the mainstay due to its superior tissue contrast resolution due to perform to the tumor in the sagittal, axial, and coronal plane. ***(Curvo-Semedo 2020).***

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The MRI and principles for staging advanced rectal cancers were developed with sufficient resolution to assess the layers of the rectal wall and the mesorectal plane. In low rectal cancers, additional sequences can be added to optimally depict the levator muscles, sphincter complex, intersphincteric plane, and the relationship to the rectal wall, improving visualization and operative planning. ***(Santiago, Figueiredo et al. 2020)***.

Key features are well defined on MRI, allowing for noninvasive, highly accurate rectal cancer staging. Measurement of the distance from the most caudal aspect of the tumor to the anal verge and the relationship of the tumor to the upper margin of the puborectalis sling are clearly seen, assisting in determination of sphincter preservation. ***(Lynes 2020)***.

The location of the tumor relative to the anal sphincter complex in locally advanced low rectal cancer is also clearly seen, to help identify patients who will benefit from nCRT, potentially improving sphincter preservation and disease-free survival, and reducing abdomino-perineal resection (APR) rates. ***(Matsuda, Sumi et al. 2018)***.

Most staging failures occur in the differentiation between T2 and borderline T3 lesions or distinguishing MRF invasion from desmoplastic reactions. The number and status of lymph nodes examined have been long described as one of the most important criteria in determining the management and outcomes in rectal cancer. Historic studies described the number of lymph nodes retrieved to correlate with outcome, prognosis, and survival. ***(Nougaret, Castan et al. 2019)***.

Although MRI remains the best imaging tool for the preoperative assessment of CRM and should be performed in all patients with rectal cancer, it can overestimate CRM involvement in low and anterior tumors. Consequently, tumor location should be considered. ***(Seo, Kim et al. 2019)***.

And the MRI finding will be assessed by the surgical and histopathological findings (Evaluate correlation between MRI finding and Surgical & Final Pathology).

1. **Finding of the surgery.**
   A. Distance of the tumor from anal verge (upper, Middle & Lower).
   B. Location of the tumor (anterior or posterior or lateral).
   C. Presence of enlarged LNs.
   D. Involvement of the tumor into intersphincteric planes and Puborectalis Muscle.
   E. Invasion to adjacent structures (Bladder and Uterus).

2. **Finding of the Histopathology**
   - Pathological subtypes
   - T stage, N stage
   - Proximal, Distal, Circumferential Radial Margin
   - Number of LNs
   - Mesorectal fascia involvement

References

Amin, M.B., F.L. Greene, S.B. Edge, C.C. Compton, J.E. Gershenwald, R.K. Brookland, L. Meyer, D.M. Gress, D.R. Byrd and D.P. Winchester (2017). "The eighth edition AJCC cancer staging manual: continuing to build a bridge from a population-based to a more "personalized" approach to cancer staging." CA: a cancer journal for clinicians, 67(2): 93-99.

Bray, F., J. Ferlay, I. Soerjomataram, R.L. Siegel, L.A. Torre and A. Jemal (2018). "Global cancer statistics 2018: GLOBOCAN estimates of incidenceand mortality worldwide for 36 cancers in 185 countries." CA: a cancer journal for clinicians 68(6): 394-424.

Curvo-Semedo, L. (2020). "Rectal cancer: staging." Magnetic Resonance Imaging Clinics 28(1): 105-115.

Hajibandeh, S., S. Hajibandeh, M. Eltair, A.T. George, V. Thumbe, A.W. Torrance, M. Budhoo, H. Joy and R. Peravali (2020). "Meta-analysis of transanal total mesorectal excision versus laparoscopic total mesorectal excision in management of rectal cancer." International journal of colorectaldisease 35(4): 575-593.

Heald, R.J., I. Santiago, O. Pares, C. Carvalho and N. Figueiredo (2017). "New Horizons in Rectal Cancer Management: The Perfect Total Mesorectal Excision Obviates the Need for Anything Else in the Management of Most Rectal Cancers." Clinics in colon and rectal surgery 30(5): 324.

Knol, J. and D.S. Keller (2020). "Total Mesorectal Excision Technique—Past, Present, and Future." Clinics in colon and rectal surgery 33(03): 134-143.

Lynes, K.V. (2020). Determinants of sphincter preservation in low rectal surgery for cancer, Queen Mary University of London.

Matsuda, T., Y. Sumi, K. Yamashita, H. Hasegawa, M. Yamamoto, Y. Matsuda, S. Kanaji, T. Oshikiri, T. Nakamura and S. Suzuki (2018). "Outcomes and prognostic factors of selective lateral pelvic lymph node dissection with preoperative chemoradiotherapy for locally advanced rectal cancer." International journal of colorectal disease 33(4): 367-374.

Nougaret, S., F. Castan, H. Forges, H. Vargas, B. Gallix, S. Gourgou, P. Rouanet, E. Rullier, B. Lelong and P. Maingon (2019). "Early MRI predictors of disease-free survival in locally advanced rectal cancer from the GRECCAR 4 trial." British Journal of Surgery 106(11): 1530-1541.

Romesser, P.B., A.J. Wu, A. Cercek, J.J. Smith, M. Weiser, L. Saltz, J. Garcia-Aguilar and C.H. Crane (2020). "Management of

locally advanced rectal cancer during the COVID-19 pandemic: a necessary paradigm change at Memorial Sloan Kettering Cancer Center." Advances in radiation oncology 5(4): 687-689.

Santiago, I., N. Figueiredo, O. Parés and C. Matos (2020). "MRI of rectal cancer—relevant anatomy and staging key points." Insights into Imaging 11(1): 1-21.

Seo, N., H. Kim, M.S. Cho and J.S. Lim (2019). "Response assessment with MRI after chemoradiotherapy in rectal cancer: current evidences." Korean journal of radiology 20(7): 1003.

Smith, J.J., P.B. Paty and J. Garcia-Aguilar (2020). "Watch and Wait in Rectal Cancer or More Wait and See?" JAMA surgery 155(7): 657-658.

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