NSQIP DATABASE TRENDS IN NEOADJUVANT THERAPY AND SURGICAL OUTCOMES FOR RECTAL CANCER

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Introduction

Rectal cancer treatment has evolved over the last 10-15 years. Neoadjuvant therapy (RT +/- concomitant 5 FU or capecitabine) followed by surgical resection had previously been the gold standard for T3 and/or N-1 lesions, however, in recent years there has been a shift towards the use of preoperative systemic chemotherapy +/- RT. The concept of total neoadjuvant treatment (RT + systemic chemotherapy) has been adopted by many in this field. Also, the recognition that this approach can result in complete response led to the "Watch and Wait" approach that is being widely adopted. Surgery is being performed less often. This study aimed to examine trends in utilization of neoadjuvant therapy and surgical approaches for patients with rectal cancer, as well as short-term outcomes following oncologic rectal resection over the past 8 years using a large national database.

Methods

This study utilized the American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP) Targeted Proctectomy database and included all rectal cancer patients enrolled during 3 one-year periods (2016, 2021, and 2022). In patients that received neoadjuvant treatment, the utilization rates of systemic chemotherapy and radiotherapy alone and together were determined. As regards surgery, the operative approach breakdown was noted in addition to short-term outcomes including superficial and deep incisional surgical site infections (SSIs), and transfusion requirements. Statistical significance was evaluated using chi-square tests.

	Total Rectal Cancer Protectomies	Distal Third Rectal Cancers	Middle Third Rectal Cancers	Proximal Third Rectal Cancers
2016	1700	894 (53%)	527 (31%)	256 (15%)
2021	1813	1001 (55%)	532 (29%)	280 (16%)
2022	1864	970 (52%)	555 (30%)	339 (18%)

Table 1: Proctectomy Cases for Rectal Cancers By Location and Year

	Neoadjuvant Chemo/RT	Only Neoadjuvant Chemo	Only Neoadjuvant RT	No Neoadjuvant
2016	764 (45.6%)	177 (10.6%)	74 (4.4%)	690 (41.1%)
2021	514 (28.4%)	289 (15.9%)	135 (7.4%)	854 (47.1%)
2022	425 (23.2%)	352 (19.2%)	103 (5.6%)	954 (52%)

Table 2: Rectal Cancer Neoadjuvant Therapies By Year

	Open (planned)	Laparoscopic*	Robotic*
2016	698 (41.1%)	592 (34.8%)	345 (20.3%)
2021	315 (34.8%)	307 (33.9%)	266 (29.4%)
2022	509 (27.3%)	**	762 (40.9%)

Table 3: Rectal Cancer Proctectomy Operative Approaches

*Laparoscopic and Robotic numbers are combined with/without hand assist or conversion

**2022 laparoscopic numbers unable to be calculated with ACS NSQIP provided data

	Superficial SSI	Deep SSI	Transfusion Required
2016	87 (5.1%)	30 (1.8%)	206 (12.1%)
2021	97 (5.4%)	26 (1.4%)	250 (13.8%)
2022	87 (4.7%)	27 (1.4%)	210 (11.3%)

Table 4: Rectal Cancer Proctectomy Short-Term Outcomes

References

1. Liu S, Jiang T, Xiao L, et al. Total Neoadjuvant Therapy (TNT) versus Standard Neoadjuvant Chemoradiotherapy for Locally Advanced Rectal Cancer: A Systematic Review and Meta-Analysis. *Oncologist*. 2021;26(9):e1555-e1566. doi:10.1002/onco.13824
2. Schrag D, Shi Q, Weiser MR, et al. Preoperative Treatment of Locally Advanced Rectal Cancer. *N Engl J Med*. 2023;389(4):322-334. doi:10.1056/NEJMoa2303269
3. Vailati BB, São Julião GP, Habr-Gama A, Perez RO. Nonoperative Management of Rectal Cancer: The Watch and Wait Strategy. *Surg Oncol Clin N Am*. 2022;31(2):171-182. doi:10.1016/j.soc.2021.11.003

Results

The analysis included 5377 patients undergoing proctectomy for rectal cancer (1700 in 2016, 1813 in 2021, 1864 in 2022). Neoadjuvant chemotherapy alone significantly increased from 10.6%* in 2016 to 15.9% in 2021 to 19.2%* in 2022 ($p<0.001$), combined chemotherapy and radiation (CRT) decreased from 45.6%* in 2016 to 28.4% in 2021 to 23.2%* in 2022 ($p<0.001$), and no neoadjuvant therapy increased from 41.1%* in 2016 to 52%* in 2022 ($p<0.001$). Robotic proctectomies demonstrated a notable rise from 20.3% in 2016 to 40.9% in 2022. For short-term outcomes, both superficial and deep incisional SSIs showed no significant change across the 3 years assessed (1.8% to 1.4%). Intraoperative/postoperative transfusion requirements remained statistically stable as well (12.1% to 11.3%).

*data was optimized after abstract submission with exclusion of unclassified entries, no difference in significance from original data found

Conclusion

This study highlights several interesting trends in the evolution of rectal cancer management. The significant increase in the use of chemotherapy alone for neoadjuvant therapy, as well as a reduction in the use of CRT, may reflect similar findings to the PROSPECT trial, as well as an adaption to newer clinical strategies, including total neoadjuvant therapy (TNT). Of note, the NSQIP database, because of its design, does not allow determination of how many patients received TNT which is a clear shortcoming of this study. The consistent SSI rates from 2016 to 2022 is particularly interesting with the advent of preventative strategies such as "colon bundles" in the last 5-7 years and thus may be indicative of a need for further investigation into additional or different infection control methods. Additionally, the significant increase in robotic surgery confirms clinically-witnessed trends towards embracing advancements in surgical technology. However, it should be noted our study is limited by the NSQIP database design (which do not include a TNT category and are vague and confusing regarding neoadjuvant treatment) and we therefore are unable to accurately assess this trend further. Further studies are essential to evaluate long term outcomes and continued optimization of care.