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Clinicopathological characteristics and management of patients with early readmission to our surgical oncology clinic

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ABSTRACT

Objectives: This study aimed to discuss the frequency of early readmission to the hospital after discharge in our oncology clinic, clinicopathological features, and management of these patients in light of current literature.

Methods: The medical records of 237 early readmitted patients within 30 days of discharge in our clinic were retrospectively reviewed. The patients were categorized according to their first diagnosis, Eastern Cooperative Oncology Group (ECOG) performance status, demographic, clinicopathological characteristics, readmission reasons, first treatment type, postoperative complications, the time of application after discharge and the type of treatment after admission

Results: The mean age of the patients was 58.45 years, 57.4% were female, and the mean readmission time after discharge was 11.54 days. The most common primary diagnosis was gastric cancer (35.9%), and the most common emergency pathology requiring hospitalization was ileus-subileus (45.1%). After readmission, 42.6% of the patients received medical treatment. 60% of the readmitted patients had postoperative complications before discharge. Patients who had postoperative complications during the first hospitalization were more likely to have major or minor interventions after readmission ($p < 0.01$). Admission with a diagnosis of bowel obstruction was associated with the probability of major intervention ($p < 0.01$). Patients with an ECOG performance score of ≥ 2 was more frequently administered medical treatment ($p = 0.001$). Patients admitted with the diagnosis of anastomotic leak/abscess had a higher probability of having postoperative complications ($p = 0.001$).

Conclusions: Readmissions are a concern for all healthcare providers, including comprehensive cancer centers. Recent health policies strive to reduce preventable admissions. Hence, we believe focusing on postoperative complications, and palliative care services is necessary.

Keywords: Surgical oncology, patient readmission, complication, palliative care

Unplanned readmissions in the first 30 days after discharge are a major medical problem and have been accepted as a quality indicator in recent years. Readmissions are associated with reduced quality of life, increased morbidity, and increased costs. Therefore, it is vital to evaluate the frequency of readmissions and predisposing factors, identify high-risk patients, and prevent readmissions by reducing costs and overwork. Readmission is a complex phenomenon formed by the combination of several different factors,

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such as the patient's characteristics, the inadequacy of the care given to the patient, and the characteristics of the health system. Each factor has a different effect on the readmission rate, depending on the type of disease or procedure examined, the duration, and the population in which the study was performed. Despite all its adverse impacts, it is not possible to eliminate readmissions. Hence, such an approach is also logically wrong. In this context, for policies to reduce readmissions to be successful, the factors causing readmissions and the types of readmissions must be determined [1].

Early rehospitalizations were suggested to reflect poor quality of care [2]. However, some authors suggest that some readmissions are necessary after complex treatments, such as major oncologic operations, to manage treatment-related complications appropriately [3, 4].

Studies focused on surgery on readmissions included different patient groups, used different datasets, and reported varying readmission rates ranging from 5.6% to 37.3%. Although there are significant differences between US hospitals, it was reported that approximately one in seven patients who were discharged after undergoing a major surgical procedure were readmitted to the hospital within 30 days [5]. The reasons for readmitting surgical patients to the hospital soon after discharge are likely different from those for returning patients receiving medical treatment. While patients receiving medical treatment may readmit for reasons such as inadequate social support, inability to access primary health care services, or worsening general health status, surgical patients are more likely to return due to complications from surgery [5].

Cancer and complications of medical treatments and surgical procedures can cause various problems after discharge. Hospitalized oncology patients are usually of advanced age and have locally advanced or metastatic disease. Malnutrition, significant symptom burden, dependence to some extent, and various comorbidities often leading to polypharmacy accompany these patients.

In this study, the frequency of early hospital readmission after discharge in cancer patients of our surgical oncology clinic, clinicopathological features, and the management of these patients will be discussed in light of the current literature.

METHODS

The medical records of 258 early readmitted patients within 30 days after discharge in our clinic between January 2015 and May 2021 were collected and reviewed retrospectively over the electronic data system. Due to the lack of data, 21 patients were excluded, and 237 consecutive patients who were either hospitalized or transferred were included in the study. Patients were documented according to their demographic and clinical characteristics and categorized by initial diagnosis, gender, age, ECOG performance status (PS) (0-4) at time of hospitalization, reasons for readmission, type of initial treatment, presence of postoperative complications, time of admission after discharge, and type of post-admission treatment. Also, the admissions were categorized according to four weeks of the month per the admission time. The admissions between 08:00 and 17:00 were classified as working hours and other hours as duty hours. The hours between 17:00 on Friday and 08:00 on Monday were considered weekends and the remaining weekdays. Stomach, colon, rectum, pancreas, oesophagus, and urogynecological malignancies can be counted among the initial diagnoses of the patients. The main reasons for hospitalization include partial and/or complete bowel obstruction, intra-abdominal ascites, anastomotic leak, abscess, bleeding, and evaluation for emergency feeding route (for jejunostomy, gastrostomy, and PEG). Patients were classified as major surgeries (e.g., gastrectomy, colectomy, pancreaticoduodenectomy, esophagectomy) with organ resections and reconstructions, and minor palliative interventions (e.g., diagnostic laparoscopy, biopsy), according to the type of the first operation.

Moreover, according to the treatments administered after hospitalization, patients were categorized into having major interventions (e.g., bridectomy, organ resections, and anastomosis), medical treatment, and minor interventions (e.g., paracentesis, PEG, stenting, jejunostomy, abscess drainage) with or without radiology and/or endoscopy guidance.

Approval of the Local Research Ethics Committee of our tertiary hospital was obtained before initiating the study (Ankara University Faculty of Medicine, Cebeci Hospital Turkey, Decision number: İ5-350-21, Date: 02-07-2021).

Statistical Analysis

SPSS 24.0 Windows program was used in the analysis of the data. Descriptive statistics were presented as mean±standard deviation values for the variables with normal distribution, median (min. max) for variables with non-normal distribution, and the number of cases and (%) for nominal variables. Categorical variables were analyzed with the Pearson Chi-Square or Fisher Exact test. The results were considered statistically significant for $p < 0.05$.

RESULTS

The number of patients included in the study was 237. The mean age of the patients was 58.45 ± 14.2 years (20-86), and 136 (57.4%) of the patients were female. The mean duration of admissions after discharge was 11.54 ± 9.2 (1-30) days. The most common primary diagnosis was gastric cancer (35.9%), and the most common emergency pathology requiring hospitalization was ileus-subileus (Table 1). 86.1% of the patients (n = 204) had major surgeries, including related organ resections and reconstructions, and the remaining patients had only diagnostic and or minor palliative interventions due to non-resectable and inoperable disease. After readmission, 42.6% (n = 101) of the patients were treated with medical treatment, 35.4% (n = 84) with major surgical intervention, and 21.9% (n = 52) with minor surgical interventions. Most patients were admitted during working hours (82.7%) and on weekdays (84.8%). At the rate of 60% (n = 142), most patients had postoperative complications before discharge. The highest number of readmissions (36.7%, n = 87) was made in the first week of the one month after discharge (Table 2). The patients had the most common ECOG 2 performance score (33%, n = 78) in the distribution according to their performance scores at first admission (Table 2). The most common reasons for consultation according to their diagnosis are shown in Table 3.

No significant correlation was determined in the analysis of the distribution of complications according to their diagnosis with the chi-square test ($p = 0.72$). Having post-operative complications during the first hospitalization was significantly associated with the probability of major or minor intervention after readmission ($p < 0.01$). Indeed, readmission with a diagnosis of bowel obstruction was associated with the probability of major intervention ($p < 0.01$). Pre-discharge ECOG performance score of ≥ 2 was associated with the probability of receiving medical treatment without any intervention after readmission ($p = 0.001$). Patients readmitted with anastomotic

Table 1. Primary diagnosis of patients and reasons for readmission

	Number (n)	Percentage (%)
Malignity localization		
Stomach	85	35.9
Colon	51	21.5
Pancreas	45	19
Rectum	32	13.5
Small intestine	6	2.5
Esophagus	9	3.8
Gynecological	9	3.8
Reason for readmission		
Intestinal obstruction	107	45.1
Intra-abdominal ascites	29	12.2
Hemorrhage	18	7.6
Anastomotic leak/Abscess	72	30.4
Emergency nutrition and palliative	11	4.6
TOTAL	237	100

Table 2. Post-discharge admission times and pre-discharge ECOG performances of patients

	n (%)
Hospitalization time	
1st week	87 (36.7)
2nd week	74 (31.2)
3rd week	25 (10.5)
4th week	51 (21.5)
ECOG performance	
0	40 (16.9)
1	100 (42.2)
2	78 (32.9)
3	19 (8)
4	-

Table 3. The most common reasons for consultation according to diagnosis

The diagnosis	The most common reasons	n (%)
Stomach Ca	Ileus/Subileus	18 (30.5)
Colon Ca	Ileus/Subileus	26 (72.2)
Pancreas Ca	Ileus/Subileus	4 (33.3)
Rectum Ca	Local Nüx/ascites	8 (57.4)
Small intestine Ca	Ileus/Subileus	2 (50)
Esophagus Ca	Anastomotic leak	3 (60)
Gynecological Ca	Ileus/Subileus	16 (72.29
Other Ca	Metastasis	8 (24.2)

leak/abscess diagnosis were associated with the possibility of postoperative complications ($p = 0.001$).

DISCUSSION

Our study provides information about readmissions to a surgical oncology clinic. The recent interest of insurance companies in preventable hospitalizations has increased the interest in this issue. Studies have revealed that at least 20% of hospitalizations are preventable [4, 6]. The common denominator in most literature studies is postoperative complications [7-10]. Similarly, patients with pancreatic resection, postoperative wound infections, pancreatic fistulas, and delayed gastric emptying have been reported to be associated with an increased risk of readmission [11-13]. It has also been reported that the possibility of being African American and having a lower socioeconomic status is correlated to higher readmission rates [7]. Reducing readmission rates will reduce the burden on health expenditures [14]. Besides, through the excellent use of hospital resources, it will be possible to treat another patient who needs care [15]. We have little information on this subject due to the limited number of reports from surgical oncology departments.

The mean age of the patients included in our study was relatively high (59.5 years), as they were oncological patients, and the male/female ratio was 2/5. It is known that the rate of readmission in elderly patients is high [7]. Although there are conflicting studies, the female gender has also been reported as a risk factor for readmission [7, 10].

In the study of Güven *et al*. [16], based on the data of the medical oncology departments, the rate of readmission of cancer patients was reported as 22.7%, and the main determinants as advanced disease stage, polypharmacy, and hospitalization through the emergency department. In our study, all of our patients were readmitted through the emergency service, and 15% of the readmitted patients had advanced non-resectable diseases.

Readmissions are major concerns for healthcare providers and the insurance system. Most unplanned readmissions to cancer hospitals are related to disease progression, new diagnoses, and complications of procedures. Some readmissions may not be avoided. After taking the major complications into account, it was reported that BMI >30 and preoperative weight loss increase the risk of readmission [10]. As can be seen, it is almost impossible to change some factors preoperatively. Risk factors for readmission after complex oncological procedures are high, but postoperative complications trigger readmissions in these patients. Specifically, it is assumed that postoperative complications, in particular, increase a patient's chances of returning to the hospital. Taking appropriate steps to minimize postoperative complications will reduce early readmissions [14]. Most of our patients (60%) readmitted to the hospital in our study consisted of patients who had complications in the postoperative period. Thus, patients experiencing postoperative complications are likely to have a more complex discharge plan that includes wound care instructions, antibiotic regimens, and/or rehabilitation therapy, and each of these may lead to readmission if not appropriately administered after discharge from the hospital [14]. Our study classified the performance status of oncological patients with the ECOG scale. This scale ranges from 0 to 4; "0" indicates a fully functional and asymptomatic patient, and "4" indicates a bedridden status (17).

Most patients (59%) had ECOG performance scores of ≤ 2 before discharge, and these patients were also more likely to undergo surgical intervention after hospitalization. This is probably due to the compelling orientation towards palliative and medical treatments in patients with poor performance scores. Although 58% of the patients had major or minor surgical interventions after hospitalization, it should not be ignored that there are still preventable readmissions. Prevent-

able readmission rates will increase through the on-site management of postoperative complications and revision of discharge criteria. On the other hand, most patients given medical treatment are admitted because of the difficulties in palliative care services and or issues in access. We believe that providing on-site and appropriate palliative services would reduce the intensity in oncology departments. The use of total parenteral nutrition (TPN) at discharge has been associated with potentially preventable readmission [4]. Home TPN applications to patients should be evaluated in this context.

Most readmissions are related to complications and disease progression and may not be preventable. However, adequate symptom management, discharge planning, or medication adjustments at discharge can potentially prevent at least 20% of readmissions [4, 18].

The majority of hospitalized patients (85%) had gastric, pancreatic, and colorectal malignancies (Table 1). We could not determine a relationship between primary diagnoses and the presence of complications. Most (75%) reasons for readmission were due to partial and/or complete intestinal obstruction and anastomotic leak/abscess. The probability of admission due to anastomotic leak/abscess was high in those who had postoperative complications. Also, patients readmitted with a diagnosis of intestinal obstruction were more likely to be treated with a major intervention.

Most patients were readmitted during working hours (83%) and on weekdays (85%). This condition may be due to the ease of access of these patients to emergency health services and an effective emergency consultation system.

CONCLUSION

Identifying factors associated with potentially avoidable readmissions is crucial to make any discharge decision that will ultimately result in fewer readmissions and better outcomes. We are optimistic that identifying risk factors for readmission, improving discharge and follow-up practices, and expanding patient education will lead to reduced readmissions in oncology departments. Minimizing readmissions in complex cancer patients is challenging. Larger multi-agency datasets are needed to set a reasonable standard for expected readmission rates.

Authors' Contribution

Study Conception: MAÇ; Study Design: MAÇ; Supervision: MAÇ, ŞD; Funding: MAÇ, ŞD; Materials: ŞD; Data Collection and/or Processing: MAÇ, SD; Statistical Analysis and/or Data Interpretation: MAÇ, SD; Literature Review: MAÇ; Manuscript Preparation: MAÇ, ŞD and Critical Review: SD.

Conflict of interest

The authors disclosed no conflict of interest during the preparation or publication of this manuscript.

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REFERENCES

1. Aslan EÇ, Ağırbaş İ. [The importance, types and risk factors of hospital readmission collective labour]. J Soc Secur 2018;8:173-93. [Article in Turkish]
2. Ashton CM, Del Junco DJ, Souchek J, Wray NP, Mansyur CL. The association between the quality of inpatient care and early readmission: a meta-analysis of the evidence. Med Care 1997;35:1044-59.
3. Gawlas I, Sethi M, Winner M, Ebelboym I, Lee JL, Schrope BA, et al. Readmission after pancreatic resection is not an appropriate measure of quality. Ann Surg Oncol 2013;20:1781-7.
4. Saunders ND, Nichols SD, Antiporda MA, Johnson K, Walker K, Nilsson R, et al. Examination of unplanned 30-day readmissions to a comprehensive cancer hospital. J Oncol Pract 2015;11:e177-81.
5. Tsai TC, Joynt KE, Orav EJ, Gawande AA, Jha AK. Variation in surgical-readmission rates and quality of hospital care. N Engl J Med 2013;369:1134-42.
6. Acher AW, Squires MH, Fields RC, Poultsides GA, Schmidt C, Votanopoulos KI, et al. Readmission following gastric cancer resection: risk factors and survival. J Gastrointest Surg 2016;20:1284-94.
7. Hendren S, Morris AM, Zhang W, Dimick J. Early discharge and hospital readmission after colectomy for cancer. Dis Colon Rectum 2011;54:1362-7.
8. Guinier D, Mantion GA, Alves A, Kwiatkowski F, Slim K,

Panis Y, et al. Risk factors of unplanned readmission after colorectal surgery: a prospective, multicenter study. Dis Colon Rectum 2007;50:1316-23.
9. Wick EC, Shore AD, Hirose K, Ibrahim AM, Gearhart SL, Efron J, et al. Readmission rates and cost following colorectal surgery. Dis Colon Rectum 2011;54:1475-9.
10. Kwaan MR, Vogler SA, Sun MY, Sirany AME, Melton GB, Madoff RD, et al. Readmission after colorectal surgery is related to preoperative clinical conditions and major complications. Dis Colon Rectum 2013;56:1087-92.
11. Emick DM, Riall TS, Cameron JL, Winter JM, Lillembe KD, Coleman J, et al. Hospital readmission after pancreaticoduodenectomy. J Gastrointest Surg 2006;10:1243-53.
12. McPhee JT, Hill JS, Whalen GF,Zayaruzny M, Litwin DE, Sullivan ME, et al. Perioperative mortality for pancreatectomy: a national perspective. Ann Surg 2007;246:246-53.
13. Halloran CM, Ghaneh P, Bosonnet L, Hartley MN, Sutton R, Neoptolemos JP. Complications of pancreatic cancer resection. Dig Surg 2002;19:138-46.
14. Kassin MT, Owen RM, Perez SD, Leeds I, Cox JC, Schnier K, et al. Risk factors for 30-day hospital readmission among general surgery patients. J Am Coll Surg 2012;215:322-30.
15. Khuri SF, Henderson WG, DePalma RG, Mosca C, Healey NA, Kumbhani D, et al. Determinants of long-term survival after major surgery and the adverse effect of postoperative complications. Ann Surg 2005;242:326-43.
16. Guven DC, Ceylan F, Cakir IY, Cesmeci E, Sayinalp B, Yesilyurt B, et al. Evaluation of early unplanned readmissions and predisposing factors in an oncology clinic. Support Care Cancer 2021;29:4159-64.
17. Dobbins TA, Badgery-Parker T, Currow DC, Young JM. Assessing measures of comorbidity and functional status for risk adjustment to compare hospital performance for colorectal cancer surgery: a retrospective data-linkage study. BMC Med Inform Decis Mak 2015;15:55.
18. Reddy DM, Townsend CM, Kuo YF, Freeman JL, Goodwin JS, Riall TS. Readmission after pancreatectomy for pancreatic cancer in medicare patients. J Gastrointest Surg 2009;13:1963-74.