Journal of Gastrointestinal Surgery
https://doi.org/10.1007/s11605-022-05491-x

ORIGINAL ARTICLE

Association of Medical Appointment Cancellation Rates on Survival After Esophagectomy for Esophageal Cancer

Daniel Knewitz[1] · Angel M. Charles[2] · Ryan M. Thomas[2,3]

Received: 20 May 2022 / Accepted: 10 September 2022

Abstract

Background Cancelled healthcare appointments, especially in patients with complex cancers, such as esophageal cancer, risk delayed treatment and adverse outcomes. We hypothesized that patients with greater rates of healthcare appointment cancellations would have decreased survival after esophagectomy for esophageal cancer.

Methods A retrospective analysis of patients from a single institution who underwent esophagectomy for esophageal cancer between 2004 and 2020 was performed. Appointment cancellations were queried 2 years pre-/post-esophagectomy and categorized as medical or ancillary. Continuous and categorical variables were compared by Mann–Whitney and chi-squared analyses, respectively. Survival associations post-esophagectomy were made by Kaplan–Meier analysis.

Result Seventy-six patients were identified. Total medical and ancillary appointments post-esophagectomy increased by 188% and 136%, respectively. Per patient, there was a median increase of 57.5 medical appointments in the post-esophagectomy period. Of medical appointments, 23.7% were cancelled pre-esophagectomy but 33.4% post-esophagectomy ($p < 0.001$). This trend held true for ancillary appointments. Patients with increased medical cancellation rates post-esophagectomy had shortened recurrence-free ($p = 0.09$) and overall survival ($p < 0.01$) versus patients with low cancellation rates.

Conclusion A significant increase in healthcare appointments is seen after esophagectomy. Patients with increased healthcare appointment cancellations have decreased post-esophagectomy survival which presents an opportunity to intervene in patients who historically have a high cancellation rate.

Keywords Esophageal cancer · Clinic cancellation

Introduction

It is estimated that 20,640 new cases of esophageal cancer will be diagnosed in the USA in 2022 with approximately 16,410 deaths and an estimated 5-year survival rate of about 20%.[1] Despite improvement in recent decades, the poor prognosis that accompanies a diagnosis of esophageal cancer underscores the significance of determining additional factors which may influence patient survival.

As with other cancer subtypes, patients with esophageal cancer require complex coordination of care as survivors are often afflicted by additional medical comorbidities that impact post-cancer treatment.[2] Unfortunately, reports show that cancer survivors, in general, fail to acquire suitable post-diagnosis medical services.[3–5] One challenge regarding the care of the cancer survivor is ensuring appropriate and timely follow-up care. Whereas the negative impact of non-attendance at cancer screening[6,7] and urgent referral appointments for

SYNOPSIS Cancellation of healthcare appointments after esophagectomy for esophageal cancer associates with worse overall survival and provides an opportunity to identify patients at high-risk for appointment cancellation in order to intervene and maximize needed post-operative follow-up for post-esophagectomy treatment and surveillance.

✉ Ryan M. Thomas
Ryan.Thomas@surgery.UFL.edu

[1] University of Florida College of Medicine, Gainesville, FL, USA

[2] Department of Surgery, University of Florida College of Medicine, Gainesville, FL PO Box 100109, USA

[3] North Florida/South Georgia Veterans Healthcare System, Gainesville, FL, USA

Published online: 26 October 2022

Table 1 Clinicopathologic data for patients undergoing esophagectomy for esophageal carcinoma

	Entire cohort ($n=76$)
Age	
Mean (SD)	64.1 (7.7)
Median (IQR)	64.2 (7.5)
Sex (*n*, %)	
Female	0 (0)
Male	76 (100)
Race (*n*, %)	
White	63 (82.9)
Black	3 (3.9)
Undisclosed	10 (13.2)
Histology (*n*, %)	
Adenocarcinoma	71 (93.4)
Squamous cell	5 (6.6)
Nodal status (*n*, %)	
Negative	39 (51.3)
Positive	34 (44.7)
Margin status (*n*, %)	
R0	74 (97.4)
R1	2 (2.6)
Neoadjuvant chemoradiation (*n*, %)	
No	10 (13.2)
Yes	66 (86.8)

suspected cancer[8,9] is well-documented, knowledge of the association between missed healthcare appointments and survival outcomes in the patient with known cancer is limited. One tumor type in which appointment attendance associates with enhanced survival is colorectal cancer,[10,11] highlighting the need to identify patients at risk for appointment non-attendance.[12] Finally, a new cancer diagnosis imparts a significant financial and emotional burden on patients and their families related to additional medical care.[13,14] Evaluating factors associated with this additional medical care and its potential impact on cancer survival is important to address and overcome potential hurdles that prevent patients from maintaining routine post-operative care after a diagnosis of esophageal cancer. Further investigation is thus needed to determine whether appointment cancellations independently affect survival outcomes in other cancer subtypes.

To further investigate the effect of healthcare follow-up on survival outcomes, we sought to analyze the impact of appointment cancellation rates pre- and post-esophagectomy in patients diagnosed with esophageal cancer. This study tests the hypothesis that medical appointment cancellations are inversely proportional to esophageal cancer survival post-esophagectomy.

Table 2 Summary of healthcare appointment cancellations before and after esophagectomy in patients with esophageal cancer

Medical visits	Pre-Esophagectomy	Post-Esophagectomy
Total visits (*n*, %)	1657 (100)	4770 (100)
Mean (SD)	21.8 (19.1)	62.8
Median (IQR)	18 (24)	57.5 (43)
Administrative Cx (*n*, %)	191 (11.5)	715 (15)
Mean (SD)	2.5 (2.8)	9.4 (5.6)
Median (IQR)	2 (3.5)	8 (7.5)
Patient Cx (*n*, %)	160 (9.7)	553 (11.6)
Mean (SD)	2.1 (2.3)	7.3 (6.3)
Median (IQR)	1.5 (3)	5.5 (5.5)
Patient no-show (*n*, %)	92 (5.6)	238 (5)
Mean (SD)	1.2 (2.2)	3.1 (4.8)
Median (IQR)	0 (1)	2 (4)
Total Cx (*n*, %)	443 (26.7)	1506 (31.6)
Mean (SD)	5.8 (5.7)	19.8 (14.1)
Median (IQR)	5 (8)	16 (12.5)
Ancillary Visits		
Total visits (*n*, %)	684 (100)	1691 (100)
Mean (SD)	9 (6.9)	22.3 (16.1)
Median (IQR)	8 (11.5)	18 (19)
Administrative Cx (n, %)	56 (8.2)	256 (15.1)
Mean (SD)	0.74 (1.1)	3.4 (2.5)
Median (IQR)	0 (1)	3 (3)
Patient Cx (n, %)	65 (9.5)	221 (13.1)
Mean (SD)	0.86 (1.25)	2.9 (7)
Median (IQR)	0.5 (1)	1.5 (2.5)
Patient no-show (*n*, %)	36 (5.3)	52 (3.1)
Mean (SD)	0.47 (1.3)	0.68 (1.7)
Median (IQR)	0 (0)	0 (1)
Total Cx (*n*, %)	157 (23)	529 (31.3)
Mean (SD)	2.1 (2.4)	7 (8.4)
Median (IQR)	1 (3)	5 (5.5)

Cx cancellations, *SD* standard deviation, *IQR* interquartile range; Mean and median represent values from the entire cohort; Percentages indicate percent of cancelled appointments in relation to total visits (either medical or ancillary, where appropriate)

Methods

An IRB-approved retrospective analysis of patients who underwent esophagectomy for esophageal carcinoma at the Malcom Randall Veterans Administration Medical Center (VAMC) was performed. Inclusion criteria for this study population were any patient with a diagnosis of esophageal carcinoma (adeno or squamous cell subtype) who ultimately underwent oncologic treatment with an esophagectomy, all oncologic care related to the treatment of their malignancy was rendered within the Malcom Randall VAMC health system, and the patient had an assigned primary care provider such that routine healthcare was performed solely within the VAMC. Exclusion criteria were those patients

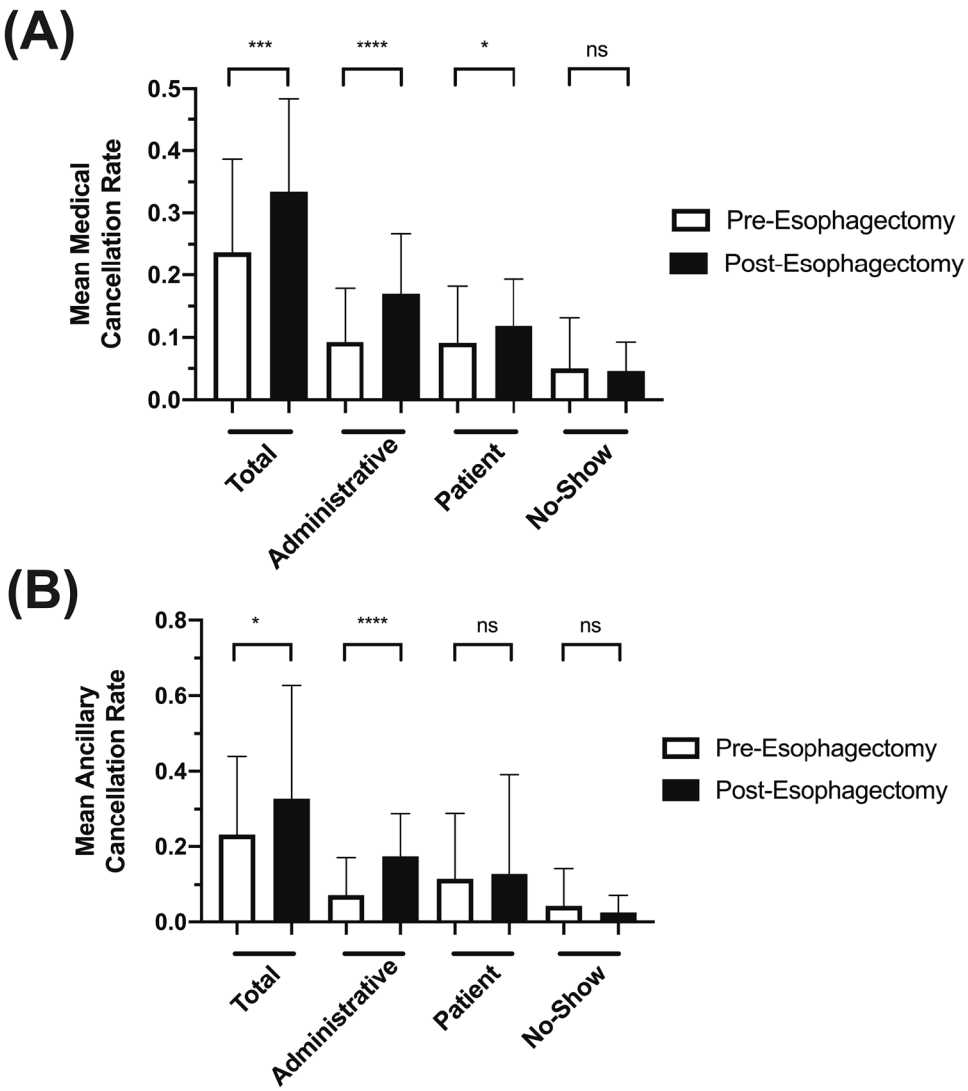


Fig. 1 Healthcare appointment cancellation rates in patients who underwent esophagectomy before and after their diagnosis of esophageal cancer. Mean with a standard deviation of medical (**A**) and ancillary (**B**) cancellation rates are depicted for each of the major categories of cancellation (administrative, patient, and no-show) both pre-diagnosis of esophageal cancer (white bars) and post-diagnosis (black bars). A significant increase in healthcare appointment cancellation rates for many of the categories after a patient is diagnosed with esophageal cancer. $p = 0.05$ (*), $p < 0.001$ (***), $p < 0.0001$ (****), ns = not significant

without a definitive diagnosis of esophageal cancer, patients treated with definitive chemoradiation without esophagectomy, patients with T1 esophageal cancer treated with endoscopic submucosal dissection (with/without chemoradiation), and patients who underwent salvage esophagectomy for esophageal cancer originally treated with definitive chemoradiation. Routine clinicopathologic criteria were collected including the query of total healthcare appointments and cancelled appointments 2 years pre-esophagectomy and 2 years post-esophagectomy. Healthcare appointments were classified as either "medical" or "ancillary". Medical appointments included any visit conducted by a medical doctor, advanced registered nurse practitioner, physician assistant, physical therapist, registered dietician, or pharmacist along with appointments in which the patient met with a chemotherapy nurse or an anticoagulation specialist. The "ancillary" visits included scheduled routine lab work, radiologic imaging, and procedures, such as endoscopy. Data describing patient clinical follow-up included the total amount of scheduled appointments, cancellations made by the clinic, cancellations made by the patient, no-shows, and total cancellations. Oncologic outcomes were based on recurrence-free survival (RFS; period defined as the elapsed time from esophagectomy to cancer recurrence) and overall survival (OS; defined as the elapsed time from esophagectomy to death). Overall survival was reported instead of cancer-specific survival because a specific cause of death was not available for some patients but the date of death is routinely reported to the VA for all patients. Thus, to not limit the power of survival analysis, as patients with the missing cause of death would have to be censored, overall survival was reported where appropriate.

Statistical analyses were performed utilizing Stata v13 software (StataCorp LLC; College Station, TX) and GraphPad Prism v8 (GraphPad Software; San Diego, CA). Normality of variable distribution was performed using the Shapiro–Wilk test whereby the comparison of medians between two groups of non-normally distributed

Table 3 Summary of healthcare appointment cancellations after esophagectomy in patients with esophageal cancer dichotomized by post-operative ED visit or 90-day readmission

Medical Visits	30-day Post-op ED visit		*p*	90-day readmission		*p*
	No	Yes		No	Yes	
Total visits (*n*, %)	2562 (100)	2088 (100)	0.74	2462 (100)	2026 (100)	0.8
Mean (SD)	61 (29.2)	69.6 (43.3)		66.5 (32.4)	67.5 (39.3)	
Median (IQR)	61.5 (2)	54.5 (45)		62 (37)	56.5 (45)	
Administrative Cx (*n*, %)	383 (14.9)	309 (14.8)	0.46	354 (14.4)	308 (15.2)	0.4
Mean (SD)	9.1 (5.3)	10.3 (6.1)		9.6 (5.9)	10.3 (5.5)	
Median (IQR)	8 (7)	8.5 (8)		8 (7)	9 (7)	
Patient Cx (*n*, %)	262 (10.2)	270 (12.9)	0.3	256 (10.4)	256 (12.6)	0.8
Mean (SD)	6.2 (.3)	9 (8.5)		6.9 (4.9)	8.5 (8.2)	
Median (IQR)	5.5 (5)	6 (8)		6 (7)	5 (7)	
Patient no-show (*n*, %)	129 (5)	101 (4.8)	0.4	96 (3.9)	131 (6.5)	0.66
Mean (SD)	3.1 (3.6)	3.4 (6.4)		2.6 (2.8)	4.4 (6.8)	
Median (IQR)	2 (5)	1 (3)		2 (3)	2 (6)	
Total Cx (*n*, %)	774 (30.2)	680 (32.6)	0.5	706 (28.7)	695 (34.3)	0.52
Mean (SD)	18.4 (10.2)	22.7 (18.6)		19.1 (10.5)	23.2 (18.3)	
Median (IQR)	17 (12)	16.5 (15)		16 (15)	18 (12)	
Ancillary visits						
Total visits (*n*, %)	992 (100)	652 (100)	0.95	830 (100)	760 (100)	0.6
Mean (SD)	23.6 (18.4)	21.7 (13)		22.4 (15.5)	25.3 (17.7)	
Median (IQR)	19.5 (20)	18 (17)		19 (18)	19 (22)	
Administrative Cx (*n*, %)	136 (13.7)	109 (16.7)	0.5	138 (16.6)	99 (13)	0.5
Mean (SD)	3.2 (2.4)	3.6 (2.6)		3.7 (2.6)	3.3 (2.5)	
Median (IQR)	2 (3)	3 (3)		3 (3)	3 (3)	
Patient Cx (*n*, %)	152 (15.3)	68 (10.4)	0.86	139 (16.7)	76 (10)	0.4
Mean (SD)	3.6 (9.2)	2.3 (2.2)		3.6 (9.8)	2.5 (2.3)	
Median (IQR)	2 (4)	2 (2)		2 (4)	2 (2)	
Patient no-show (*n*, %)	37 (3.7)	15 (2.3)	0.39	24 (2.9)	26 (3.4)	0.3
Mean (SD)	0.9 (2)	0.5 (1.1)		0.65 (2)	0.9 (1.4)	
Median (IQR)	0 (1)	0 (1)		0 (1)	0 (1)	
Total Cx (*n*, %)	325 (32.8)	192 (29.4)	0.52	301 (36.3)	201 (26.4)	0.7
Mean (SD)	7.7 (10.8)	6.4 (3.9)		8.1 (11.3)	6.7 (4.3)	
Median (IQR)	5 (6)	5 (4)		5 (7)	6 (5)	

continuous variables was made by the Wilcoxon rank sum test with the interquartile range (IQR) listed. Categorical variables were compared using chi-squared analysis. Kaplan–Meier logistic regression analysis was performed to assess the RFS and OS of the study population comparing medical appointment cancellation rates based on dichotomized cohorts at the median for cancelled/missed appointments where described. A 2-sided *p*-value of 0.05 was considered statistically significant.

Results

A total of 76 patients were identified between 2004–2020 who received a diagnosis of esophageal carcinoma and underwent subsequent esophagectomy with a median follow-up of 16 months after surgery. Seventy-one patients (93%) were diagnosed with adenocarcinoma at a median age of 64.2 years (IQR 7.5). All patients in the study cohort were male, not unexpected for a VAMC-based study. Additional clinicopathologic data are summarized in Table 1.

Esophageal Cancer Diagnosis Results in a Significant Increase in Healthcare Appointments

The total number of pre-esophagectomy medical visits for the entire cohort was 1657 with 678 ancillary visits. In comparison, the total number of post-esophagectomy medical and ancillary visits for the entire cohort was 4770 and 1603, respectively. This represents a 188% and 136% increase in medical and ancillary visits, respectively, after esophagectomy.

On a per-patient basis, there was an increase in the median number of medical post-esophagectomy visits (57.5, IQR 43) compared to pre-esophagectomy visits (18, IQR 24; $p < 0.0001$). Furthermore, the median number of ancillary visits also increased between the pre-esophagectomy and post-esophagectomy time period (8, IQR 11.5 vs. 18, IQR 19; $p < 0.0001$). A summary of healthcare appointment cancellations is detailed in Table 2 based on the entire cohort.

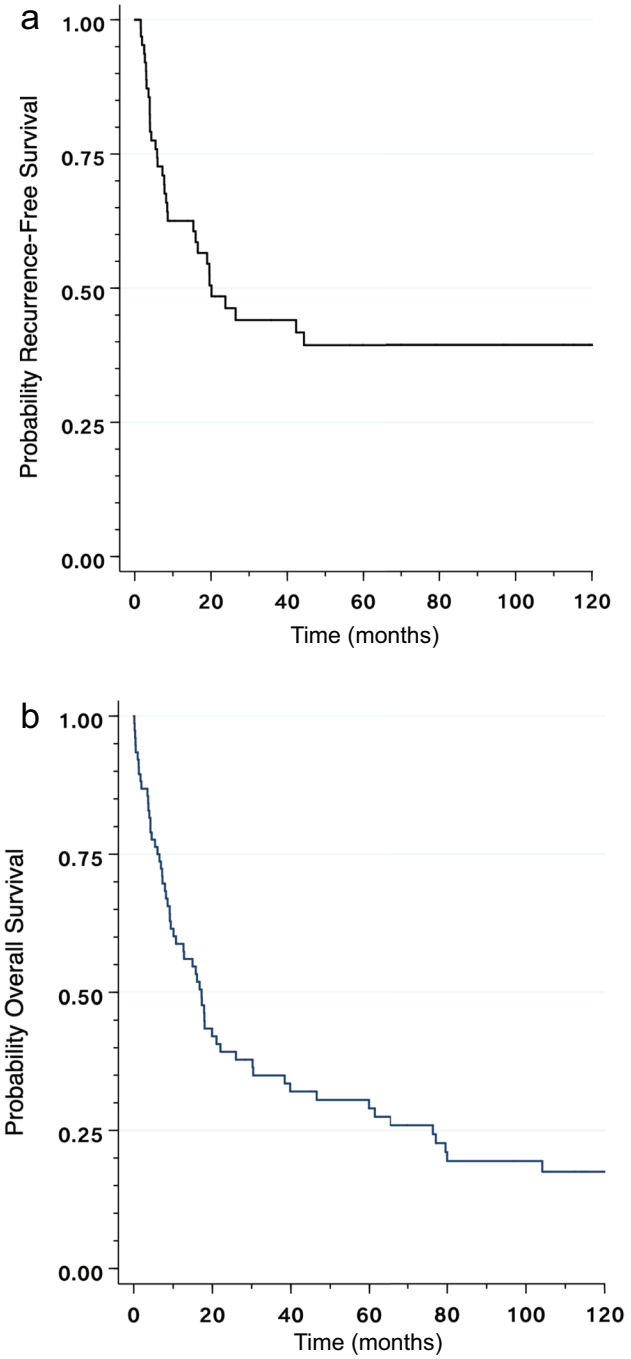


Fig. 2 Kaplan–Meier logistic regression of recurrence-free and overall survival in esophageal cancer patients who underwent esophagectomy. Kaplan–Meier logistic regression analysis of recurrence-free survival (**a**) and overall survival (**b**) for patients who underwent esophagectomy for esophageal cancer for the entire presented cohort

The Frequency of Healthcare Appointment Cancellations Increased After the Diagnosis of Esophageal Cancer

Cancellation of healthcare appointments (either medical or ancillary) was categorized as administrative (cancelled by hospital personnel), patient cancellation (active process of a patient cancelling an appointment either by phone or electronically), and patient no-show (patient fails to attend a scheduled appointment). Pre-esophagectomy, an average of 23.7% and 23.1% of medical and ancillary appointments were cancelled per patient, respectively. In comparison, 33.4% ($p = 0.0001$) and 32.7% ($p = 0.03$) of medical and ancillary appointments were cancelled post-esophagectomy per patient, respectively. The trend for increased cancellation of healthcare appointments after the diagnosis of esophageal cancer is summarized for each cancellation category in Fig. 1 based on cancellation rates for the entire cohort.

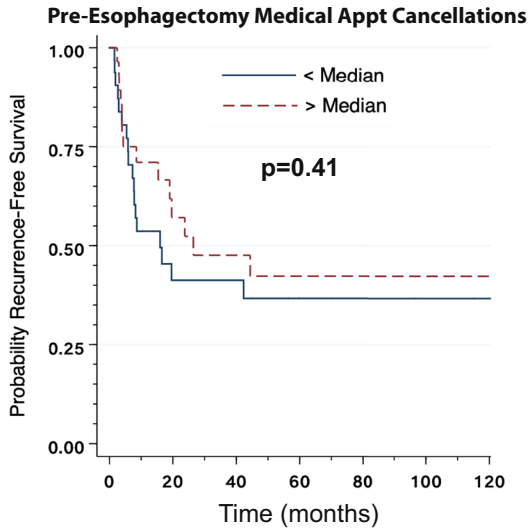
Cancellation Rates Did Not Associate with Post-Operative Emergency Department Visits or Readmission

Given that cancellation of healthcare appointments post-esophagectomy may be explained by increased visits to the emergency department (ED) or readmission (as previously scheduled appointments may be subsequently cancelled because of care rendered in the ED or during readmission), healthcare appointment cancellation rates were compared amongst patients with/without an ED visit 30-day post-operatively and with/without a 90-day hospital readmission (Table 3). This did not demonstrate differences in healthcare cancellation rates for any of the cancellation cohorts based on 30-day ED visit or 90-day readmission and suggests that differences in cancellation rates are not secondary to ED visits or hospital readmission post-esophagectomy.

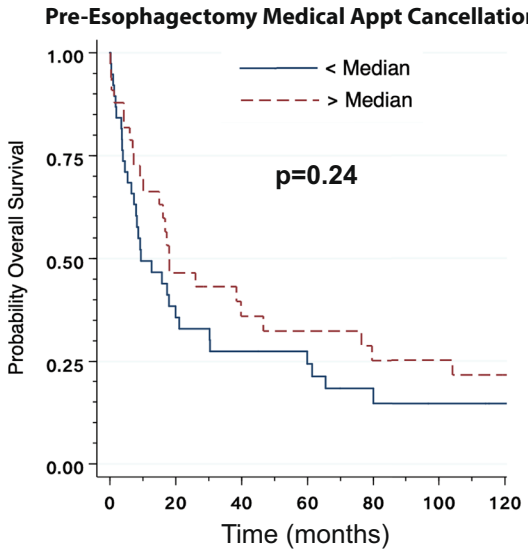
Post-Esophagectomy Cancer Survival is Inversely Associated with Post-Esophagectomy Healthcare Appointment Cancellation

To test the hypothesis that healthcare appointment cancellations are inversely proportional to survival after esophagectomy for esophageal cancer, Kaplan–Meier logistic regression analysis was performed. The RFS and OS of the entire cohort are illustrated in Fig. 2. Kaplan–Meier logistic regression of RFS and OS was subsequently performed on the cohort dichotomized at the median percentage of total medical visits cancelled (high/low) pre-esophagectomy and post-esophagectomy (Fig. 3). Pre-esophagectomy, there was no significant difference in RFS ($p = 0.41$) or OS ($p = 0.24$) for patients regardless of the proportion of medical visits cancelled. However, patients with a higher percentage of medical visit cancellations post-esophagectomy had a shortened, but not statistically significant, RFS ($p = 0.09$) but a statistically shortened OS ($p < 0.01$) compared to patients with a low cancellation rate. Because stage, primarily nodal

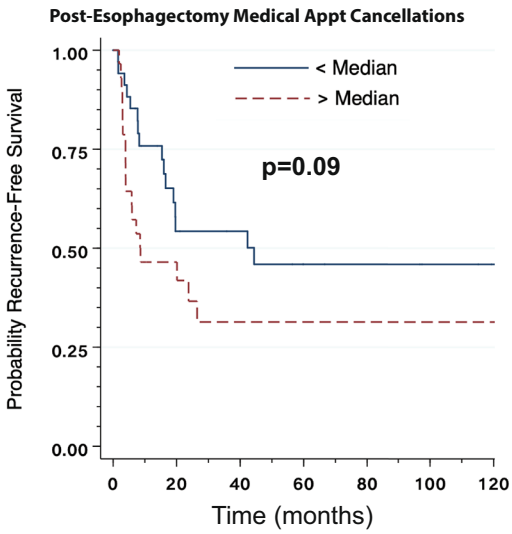
a


Pre-Esophagectomy Medical Appt Cancellations
Probability Recurrence-Free Survival
1.00
0.75
0.50
0.25
0.00
< Median
> Median
p=0.41
0
20
40
60
80
100
120
Time (months)

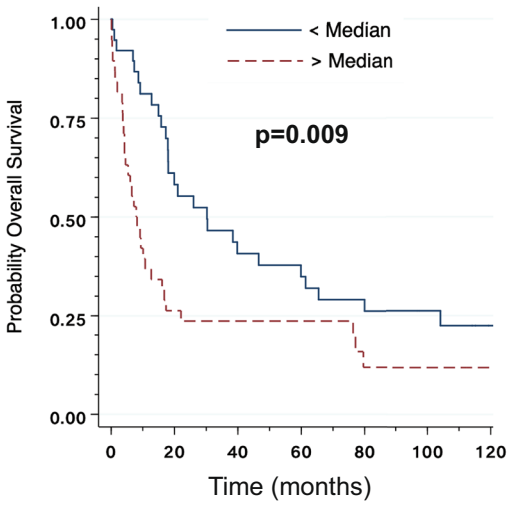
b


Pre-Esophagectomy Medical Appt Cancellations
Probability Overall Survival
1.00
0.75
0.50
0.25
0.00
< Median
> Median
p=0.24
0
20
40
60
80
100
120
Time (months)

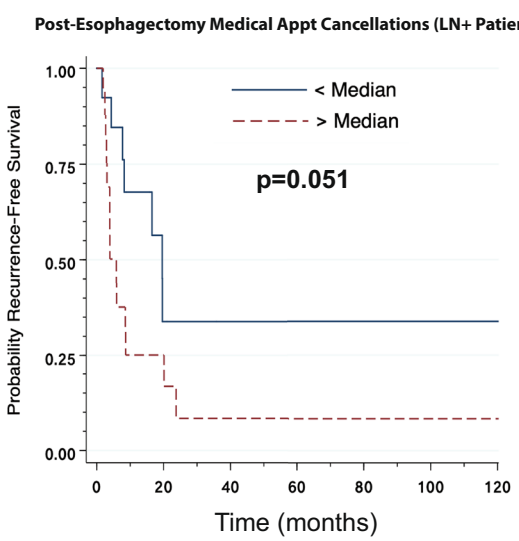
c


Post-Esophagectomy Medical Appt Cancellations
Probability Recurrence-Free Survival
1.00
0.75
0.50
0.25
0.00
< Median
> Median
p=0.09
0
20
40
60
80
100
120
Time (months)

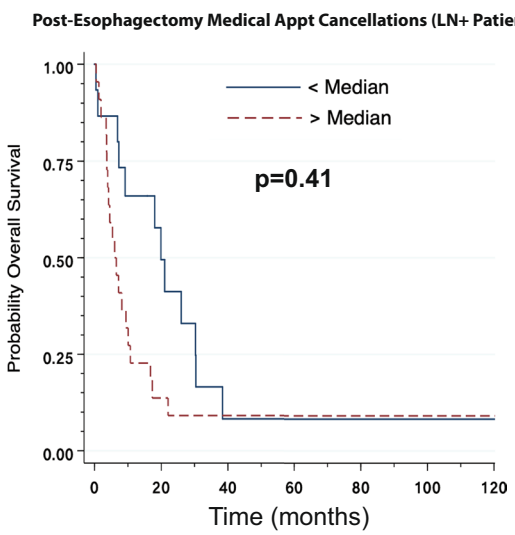
d


Post-Esophagectomy Medical Appt Cancellations
Probability Overall Survival
1.00
0.75
0.50
0.25
0.00
< Median
> Median
p=0.009
0
20
40
60
80
100
120
Time (months)

e


Post-Esophagectomy Medical Appt Cancellations (LN+ Patients)
Probability Recurrence-Free Survival
1.00
0.75
0.50
0.25
0.00
< Median
> Median
p=0.051
0
20
40
60
80
100
120
Time (months)

f


Post-Esophagectomy Medical Appt Cancellations (LN+ Patients)
Probability Overall Survival
1.00
0.75
0.50
0.25
0.00
< Median
> Median
p=0.41
0
20
40
60
80
100
120
Time (months)

◂**Fig. 3** Kaplan–Meier logistic regression of recurrence-free and overall survival in esophageal cancer patients who underwent esophagectomy stratified by pre- and post-diagnosis medical appointment cancellation rates. Kaplan–Meier logistic regression analysis of recurrence-free survival (**a**, **c**, **e**) and overall survival (**b**, **d**, **f**) of patients diagnosed with esophageal cancer who underwent esophagectomy. Groups are dichotomized at the median of the medical appointment cancellation rate either pre-diagnosis of esophageal cancer (**a**, **b**) or post-diagnosis (**c**, **d**). Because lymph node (LN) positivity portends a worse survival, an additional subset analysis of recurrence-free (**e**) and overall survival (**f**) is presented for patients with positive lymph nodes on final pathology based on their medical appointment cancellation rate being less than or greater than the cohort cancellation rate

status, can have an impact on these survival parameters, a subset analysis of only node-positive patients was also performed. This demonstrated that in the context of node-positive esophageal cancer patients, patients with a high cancellation rate again had a shorter RFS ($p = 0.051$) and OS ($p = 0.04$) compared to patients with a lower proportion of cancellations.

Discussion

Compared to patients with a low percentage of medical visit cancellations post-esophagectomy, those with a higher percentage were shown to have significantly shorter overall survival. This held true following a subset analysis of only node-positive patients. Although non-significant, recurrence-free survival was also reduced. Additionally, there were significantly more medical and ancillary cancellations post-esophagectomy compared to pre-esophagectomy. Although the greatest increase in cancellations was noted in the administrative category, a rise was noted in both the patient and no-show categories as well. Our results demonstrate that low appointment cancellation rates associate with better survival outcomes in patients with esophageal cancer who undergo esophagectomy and provide a potential opportunity to educate staff and patients, prior to definitive surgical resection, on the importance of follow-up.

A limited number of reports demonstrate the association between appointment cancellation rates and cancer survival. Within a cohort including various cancer subtypes (mostly represented by survivors of the gastrointestinal, lung, head/neck, and breast cancer), Delgado Guay et al. documented worse survival in advanced cancer patients who missed their first appointment at supportive outpatient clinics.[15] Additionally, in a cohort of patients with a new cancer diagnosis, Smith et al. demonstrated that compliance with dental visits is associated with improved cancer survival.[16] As Kosmider et al. noted,[12] identifying patients at risk for low appointment attendance may both independently and positively impact survival outcomes in patients with cancer. Our study supports these findings but in the context of patients with esophageal cancer. Unique to our study is that it incorporates the complexities of appointment cancellation rates both before and after esophagectomy with special attention paid to the types of cancellation. The COVID-19 pandemic has provided a modern-day view of healthcare appointment cancellations and its patientcare impact given the noted reductions in both new cancer diagnoses and procedures utilized to diagnose cancer.[17] As challenges associated with the pandemic, such as financial adversity, social isolation,[18] and complex restrictions[19] have affected the cancer survivor, our data demonstrate that these issues likely play a role in patient healthcare appointment cancellations independent of a global pandemic.

Our study is limited in that data was compiled from a single institution involving only male patients, limiting generalizability to other practice settings. Additionally, only patients with esophageal cancer were included in this study but provide an opportunity to study other malignancies that require the coordination of multiple specialties to optimize care, such as pancreatic cancer. Furthermore, no data could be gathered on specific reasons for the patient or administrative cancellations (such as the inability to secure transportation, lack of clinical staffing, or equipment issues). It should be noted that a process is in place to reschedule these patients who cancel or fail to show to their appointment. Specific data on the reasons for the cancellation subtype could not be gathered from the medical record as this was not consistently recorded but should be made a routine part of cancellation documentation. While a limitation of the study, it appears not associated with visits to the ED or readmission. As with other patient populations, the veteran population is susceptible to healthcare disparities because of a variety of social determinants of health. While VAMC healthcare systems often provide transportation to patients without a reliable ability to attend appointments, even this is limited as not all catchment areas may be served and patients may lack transportation to be dropped off at the local shuttle site for subsequent long-distance travel to their appointments. Additionally, states such as Florida have large areas of rural communities such that public transportation does not service these areas. The creation of transportation networks for at-risk patients would serve a critical function to the healthcare community and potentially improve the cancer survivorship of patients such as those illustrated herein. Cancellations are not limited to patient-centric reasons and system-based improvements should be taken into account to maintain timely follow-up. While unforeseeable reasons for cancellations such as a provider being out sick, equipment failure, or even weather cannot be prepared for, several areas of process improvement would help to facilitate timely and consistent follow-up. Notably, incomplete workup by other services can have a cascading effect that results in several downstream healthcare appointment cancellations. Having

appropriate hospital resources and investment can help mitigate this factor. The reported effects of healthcare appointment cancellations on survival have the potential to become worse with increased COVID-19 pandemic healthcare personnel resignations ("The Great Resignation"). Healthcare system retention and career development practices for their employees can have a positive effect on more than just the healthcare worker. Finally, because of the relatively small cohort numbers, there was not enough statistical power to perform a Cox proportional hazard test to identify independent predictors of survival in the context of high appointment cancellation rates. As such, the presented findings may not be independent factors responsible for the reduction in survival post-esophagectomy for esophageal cancer. Although our study represents an opportunity to identify other cancer patients who may be at risk due to complicated cancer treatments, readers must proceed with caution when generalizing our results to patients with different cancer diagnoses or patient populations. It does, however, provide several opportunities to aid in healthcare post-cancer diagnosis and offers an opportunity to intervene in patients with a precedence for healthcare appointment cancellation or who may have socioeconomic factors that limit their ability to follow up.

In conclusion, our data demonstrate the negative impact increased appointment cancellation rates can have on survival in patients with esophageal cancer following esophagectomy, taking into account a variety of healthcare appointment types. Additionally, our study highlights the potential increased burden placed on patients through the increases in total appointments and cancellations post-esophagectomy. Implementing practice patterns that encourage patient healthcare appointment compliance as well as healthcare system changes that minimize cancellations/rescheduling may help to alleviate the emotional burden that often accompanies esophageal cancer, and lead to improved survival following esophagectomy.

Author Contribution Study inception: RMT.
Date acquisition: DK, RMT.
Data analysis: AMC, RMT.
Manuscript preparation and editing: DK, AC, and RMT.

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