

# Assessment of Quality of Life in Patients with Esophageal Cancer after Combined Modality Therapy

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## Goals of study

To evaluate changes in quality of life (QOL) of patients with esophageal carcinoma over time following treatment with chemotherapy and radiotherapy.

## Material and Methods

The Mayo Clinic Esophageal and Barrett's Esophagus Adenocarcinoma Registry (EABE) is a multi-institutional resource that includes blood, fresh-frozen and formalin-fixed tissue, linked pathologic and clinical data, and serial validated symptom and quality of life (QOL) questionnaires obtained over time. The current investigation was performed using patients from the EABE Registry who had completed at least 2 QOL assessments (at baseline and 1 year later) with a diagnosis of either BE or EC. Each QOL measurement consisted of the Linear Analogue Self Assessment (LASA) which contained 12 questions relating to overall QOL and sub-components of QOL, which are summarized in Table #1 below.

Patients were included in the study if they had been registered in the Mayo Clinic EABE Registry and had completed at least 2 QOL assessments (baseline and 1 year) and receiving chemotherapy with or without radiotherapy and as a component of therapy for esophageal cancer. 42 patients (of a total of 701 patients in the EABE Registry who had completed at least 2 questionnaires) were eligible. Summary statistics were calculated for changes in QOL scores between baseline and 1 year follow-up. The mean differences were assessed to determine if there were a statistically significant change over time via the Student's t-test. The analyses were done separately for each of the 12 individual Linear Analogue Self Assessments (LASAs) questions. Kruskal-Wallis tests were performed for the difference in continuous data between groups and Chi-square (or Fischer-Exact) tests were performed for differences in categorical data between groups.

## Results

Patient characteristics are summarized in Table #2.

Table #3 shows changes in QOL scores over time for each QOL category.

For all patients, Pain Frequency (p=0.02) and Pain Severity (p=0.01) were both statistically significantly worse over time. Financial Well-being (p=0.06) and Overall QOL (p=0.09) were both marginally significantly worse.

Between genders, there was a marginal difference in Social Activity. (p=0.07). Between marital status, there were statistically significant differences between Mental Well-being (p=0.01), Physical Well-being (p=0.02), Overall QOL (p=0.002) and Spiritual Well-being (p=0.03) with single people having more improvement with time. When LASA QOL is evaluated by stage, comparing the locally advanced patients to others, the locally advanced patients did significantly worse than the other stages in both change in Financial Well-being (p=0.02) and change in Legal Concerns (p=0.02), but did better when considering change in Pain Frequency (p=0.05). There were no significant differences to report when comparing QOL scores by relapse status, however, a subset analysis of only patients without recurrent disease revealed that there was significantly worse Pain Severity (p=0.04) and a trend toward a worse Pain Frequency (p=0.07).

Table 1

**LINEAR ANALOGUE SELF ASSESSMENT**

Patient Name: \_\_\_\_\_ Date: \_\_\_\_\_

Patient Number: \_\_\_\_\_

Directions: Please circle the number (0-10) best reflecting your response to the following that describes your feelings during the past week, including today.

How would you describe:

- your overall Quality of Life?**  
0 1 2 3 4 5 6 7 8 9 10  
As bad as it can be As good as it can be
- your overall mental (intellectual) well being?**  
0 1 2 3 4 5 6 7 8 9 10  
As bad as it can be As good as it can be
- your overall physical well being?**  
0 1 2 3 4 5 6 7 8 9 10  
As bad as it can be As good as it can be
- your overall emotional well being?**  
0 1 2 3 4 5 6 7 8 9 10  
As bad as it can be As good as it can be
- your level of social activity?**  
0 1 2 3 4 5 6 7 8 9 10  
As bad as it can be As good as it can be
- your overall spiritual well being?**  
0 1 2 3 4 5 6 7 8 9 10  
As bad as it can be As good as it can be
- the frequency of your pain?**  
0 1 2 3 4 5 6 7 8 9 10  
No pain Constant pain
- the severity of your pain, on the average?**  
0 1 2 3 4 5 6 7 8 9 10  
No pain Pain as bad as you can imagine
- your level of fatigue, on the average?**  
0 1 2 3 4 5 6 7 8 9 10  
No fatigue Constant tiredness
- your level of support from friends and family?**  
0 1 2 3 4 5 6 7 8 9 10  
No support Highest level of support
- your financial concerns?**  
0 1 2 3 4 5 6 7 8 9 10  
Constant concerns No concerns
- your legal concerns (will, advanced directives, etc.)?**  
0 1 2 3 4 5 6 7 8 9 10  
Constant concerns No concerns

Table 2

**Patient Characteristics for Patients who Received Treatment Between Assessments**

	Total (N=42)
<b>Age (Continuous)</b>	
Mean (SD)	60.2 (10.31)
Median	60.0
Range	(35.0-83.0)
<b>Age (Categorical)</b>	
18-50	6 (14.3%)
51-65	26 (61.9%)
>=65	10 (23.8%)
<b>Gender</b>	
F	7 (16.7%)
M	35 (83.3%)
<b>Marital Status</b>	
Married	37 (88.1%)
Single	5 (11.9%)
<b>Stage</b>	
Locally Advanced	37 (88.1%)
Low Stage	2 (4.8%)
Metastatic	3 (7.1%)
<b>Recurrence</b>	
No Recurrence	35 (83.3%)
Recurrence	7 (16.7%)

Table 3

**Comparisons for Patients who had Treatment Between Assessments**

	Baseline (1st Assessment) (N=43)	Second Assessment (N=43)	p value
<b>Fatigue</b>			0.16
N	43	43	
Mean (SD)	5.2 (2.67)	4.4 (2.84)	
Median	5.0	4.0	
Q1, Q3	3.0, 8.0	2.0, 7.0	
Range	(0.0-10.0)	(0.0-10.0)	
<b>Financial Well Being</b>			0.06
N	43	43	
Mean (SD)	6.0 (3.21)	7.4 (2.48)	
Median	6.0	8.0	
Q1, Q3	3.0, 9.0	5.0, 10.0	
Range	(0.0-10.0)	(2.0-10.0)	
<b>Legal Concerns</b>			0.19
N	43	43	
Mean (SD)	7.0 (2.88)	7.5 (2.91)	
Median	8.0	9.0	
Q1, Q3	5.0, 9.0	5.0, 10.0	
Range	(0.0-10.0)	(1.0-10.0)	
<b>Emotional Well Being</b>			0.23
N	43	43	
Mean (SD)	6.5 (2.35)	7.1 (2.27)	
Median	7.0	8.0	
Q1, Q3	5.0, 8.0	5.0, 9.0	
Range	(1.0-10.0)	(1.0-10.0)	
<b>Mental Well Being</b>			0.91
N	43	43	
Mean (SD)	7.5 (2.30)	7.7 (1.85)	
Median	8.0	8.0	
Q1, Q3	7.0, 9.0	7.0, 9.0	
Range	(0.0-10.0)	(3.0-10.0)	
<b>Overall Physical Well Being</b>			0.09
N	43	43	
Mean (SD)	6.9 (2.38)	6.1 (2.40)	
Median	7.0	6.0	
Q1, Q3	5.0, 9.0	5.0, 8.0	
Range	(0.0-10.0)	(1.0-10.0)	
<b>Overall QOL</b>			0.40
N	43	42	
Mean (SD)	7.2 (2.27)	6.8 (2.35)	
Median	8.0	7.0	
Q1, Q3	6.0, 9.0	6.0, 8.0	
Range	(0.0-10.0)	(0.0-10.0)	
<b>Pain Frequency</b>			0.02
N	43	43	
Mean (SD)	7.5 (2.91)	5.9 (3.43)	
Median	9.0	7.0	
Q1, Q3	7.0, 10.0	4.0, 9.0	
Range	(0.0-10.0)	(0.0-10.0)	
<b>Pain Severity</b>			0.01
N	43	42	
Mean (SD)	7.9 (2.47)	6.7 (2.48)	
Median	9.0	7.0	
Q1, Q3	7.0, 10.0	5.0, 9.0	
Range	(0.0-10.0)	(2.0-10.0)	
<b>Social Activity</b>			0.81
N	43	43	
Mean (SD)	6.4 (2.76)	6.3 (2.64)	
Median	7.0	7.0	
Q1, Q3	5.0, 8.0	5.0, 8.0	
Range	(0.0-10.0)	(0.0-10.0)	
<b>Spiritual Well Being</b>			0.28
N	42	43	
Mean (SD)	7.2 (2.57)	7.7 (2.41)	
Median	7.5	8.0	
Q1, Q3	5.0, 10.0	7.0, 10.0	
Range	(0.0-10.0)	(1.0-10.0)	
<b>Family/Friend Support</b>			0.39
N	43	43	
Mean (SD)	9.5 (1.18)	9.3 (1.19)	
Median	10.0	10.0	
Q1, Q3	9.0, 10.0	9.0, 10.0	
Range	(5.0-10.0)	(4.0-10.0)	

## Discussion

Despite the significant negative impact esophageal cancer can have on QOL, both through dysphagia and esophageal obstruction secondary to local progression, and from other symptoms secondary to regional and metastatic progression, QOL research into esophageal cancer has been modest in scope. Research into the impact of the presence of BE on QOL is even more limited. (1,2,3)

Therapy for esophageal ACAs, whether surgery, chemotherapy, and/or radiotherapy, is characterized by significant somatic discomfort and loss of function, both temporarily and chronically. Patients reported significant negative changes in QOL in the one year period after treatment, but typically show improvement with time in the absence of tumor progression. (4) Although a wide variety of reports have been published describing the impact of surgical intervention on QOL, few reports exist in the medical literature correlating QOL with outcomes and survival. (5,6,7) Absent from these reports are multi-dimensional analyses correlating QOL measures with patient demographics, tumor characteristics, and multiple treatment interventions. In particular, further research in assessing the impact of neoadjuvant chemo/radiotherapy on QOL would be of significant clinical utility for practitioners given the potential toxicity of such treatments in conjunction with their disputed clinical benefits.

Our current study highlights the continuing problems experienced by patients with on-going pain following therapy for EC, even in the absence of recurrence. Additionally, the current results regarding financial and legal QOL in patients receiving aggressive multi-modality therapy suggest that concerns with cost and legal matters such as advance directives continue to be problematic in survivors.

A previous investigation from our group found modest, but statistically significant, differences in reported QOL between married and single ED patients in a large study (N=701) comparing QOL over time in patients with Barrett's esophagus and EC. Single EC patients showed improved overall physical QOL and pain frequency QOL over time in contrast to married patients, who reported decreases in QOL with time in these categories. Pain severity showed a non-statistically significant trend between married and single EC patients. For legal QOL, both groups showed an increase over time, with the single patients demonstrating greater improvement. (8) In the current study, similar differences were noted between married and single EC patients receiving radiotherapy and chemotherapy.

Although not different between assessment, Fatigue QOL scores showed persistence of very low score, dropping to 4 at the time of the second assessment. This value may indicate that intervention is warranted in this category.

Although recurrence of cancer is significant cause of morbidity and pain in patients with EC, our analysis would suggest this problem continues to be an issue over time in survivors without recurrences, possibly related to the long term effects of surgery, chemotherapy and radiotherapy.

## Conclusions

- Survivors of esophageal cancer may require ongoing attention regarding pain management, both in terms of severity and frequency, even in the absence of recurrence.
- Although patients receiving multi-modality therapy for locally advanced tumors may experience less pain frequency in comparison to similar stage patients not receiving such therapy, the increased complexity in medical treatment may impact financial and legal aspects of QOL to a greater degree.

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