

The Impact of Malnutrition, Alcohol Use Disorder and Psychiatric Illness on Postoperative Outcomes in Head and Neck Cancer

Jamil Hayden, BA; Priyanka Tripuraneni, MS; James Leonard, MD; Jonathan Giurintano, MD
Georgetown University Hospital, Department of Otolaryngology Head and Neck Surgery

Introduction

Head and Neck Cancer (HNCA) patients experience a high rate of malnutrition due to dysphagia and cachexia as a result of both the metabolic changes of cancer and the anatomic changes at the tumor site.¹

Britton et al. have also suggested that comorbid psychiatric illness can contribute to pre-operative malnutrition in HNCA patients.² Similarly, alcohol use disorder is correlated to both the development of certain head and neck cancers and, as Righini et al. have demonstrated, to the development of malnutrition.³

This retrospective study evaluates the risk of post-operative complications in major HNCA surgeries by measuring pre-operative nutrition status and related factors of anxiety, depression, and alcohol use disorder. The Malnutrition Universal Screening Tool (MUST) is a validated nutrition assessment that identifies patients at risk for malnutrition.⁴

Malnutrition Universal Screening Tool (MUST):

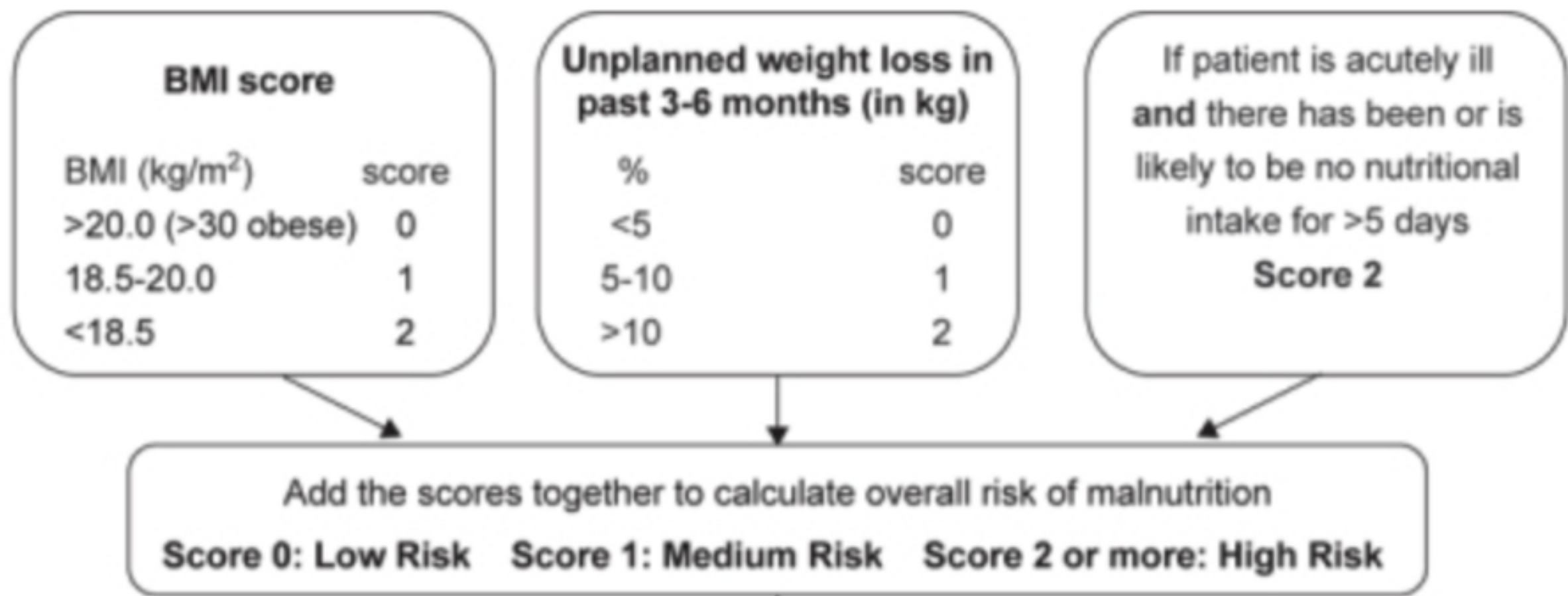


Figure 1
Malnutrition Universal Screening Tool (MUST) incorporates three elements: BMI, weight loss, and acute illness. Scores can range from 0 to 6. A score of 0 is low risk, 1 is medium risk, and 2 or more is high risk for malnutrition.

Questions:

Is there an association between preoperative malnutrition assessed with the Malnutrition Universal Screening Tool (MUST) and post-operative complications in head and neck cancer patients undergoing surgery?

Is there an association between comorbidities related to malnutrition, like alcohol use disorder and comorbid depression, and post-operative complications in head and neck cancer patients undergoing surgery?

Methods

A retrospective chart review included 275 surgical procedures performed on patients over the age of 18 years between May 2015 and May 2020. Charts were reviewed for patient demographics, surgical details, preoperative comorbidities, and postoperative complications. Malnutrition was assessed using the malnutrition universal screening tool (MUST). Surgeries that qualified for the study included neck dissections, glossectomies, total thyroidectomies, open maxillectomies, laryngectomies, and composite resections requiring free flap reconstruction.

Results

242 patient charts were reviewed totaling 275 major surgical procedures. Malnutrition, as defined by a MUST score of 1 (medium risk) or higher, was significantly associated with higher odds of total complications (OR 2.68, CI 1.57-4.57, p < 0.0001). Additionally, alcohol use disorder was significantly associated with higher odds of total complications (OR 5.18, CI 1.96, 13.71, p <0.001). Comorbid depression was also significantly associated with higher odds of total complications (OR 2.75, CI 1.01, 6.98, p <0.05).

Table 1: MUST Score Association with Complications:			
Any Complication			
p-value <0.001			
	No	Yes	Rate
Total	173	102	37.09%
MUST Score			
0	137	52	27.51%
1	20	20	50.00%
2+	16	30	65.22%
Fistula Formation			
p-value = 0.009			
	No	Yes	Rate
Total	266	9	3.27%
MUST Score			
0	187	2	1.06%
1	37	3	7.50%
2+	42	4	8.70%
Return to the Operating Room			
p-value = 0.004			
	No	Yes	Rate
Total	240	35	12.73%
MUST Score			
0	172	17	8.99%
1	34	6	15.00%
2+	34	12	26.09%
Dysphagia Requiring Gastrostomy-Tube			
p-value = 0.034			
	No	Yes	Rate
Total	235	39	14.23%
MUST Score			
0	168	20	10.64%
1	31	9	22.50%
2+	36	10	21.74%
Any Complications Excluding Dysphagia			
p-value = 0.005			
	No	Yes	Rate
Total	186	89	32.36%
MUST Score			
0	141	48	25.40%
1	22	18	45.00%
2+	23	23	50.00%

Table 1

Elevated MUST scores were significantly associated with complications, specifically: total complications, fistula formation, needing to return to the operating room (OR), dysphagia requiring a gastrostomy-tube (G-tube), any complications excluding dysphagia requiring a g-tube and free flap failure. Statistical significance was calculated using Fisher's Exact test.

Table 2: Alcohol Use Disorder and Depression Association with Complications								
	Total Complications		Dysphagia Requiring Gastrostomy-Tube		Return to the Operating Room		Any Complications Excluding Dysphagia	
	OR	p-value	OR	p-value	OR	p-value	OR	p-value
Alcohol Use Disorder	5.18 (1.96, 13.71)	P = 0.0009	3.22 (1.22, 8.51)	P = 0.0181	4.78 (1.84, 12.44)	P = 0.0013	4.15 (1.67, 10.31)	P = 0.0022
Depression	2.75 (1.01, 6.98)	P = 0.0332	3.75 (1.39, 10.10)	P = 0.0089	2.50 (0.85, 7.37)	P = 0.0968	2.77 (1.10, 6.96)	P = 0.0298

Table 2

Alcohol use disorder was significantly associated with total complications, dysphagia requiring a gastrostomy tube (G-tube), return to the operating room (OR), and all complications excluding dysphagia requiring a G-tube. Depression was significantly associated with total complications, dysphagia requiring a G-tube and any complications excluding dysphagia requiring a G-tube.

Conclusion

The presence of preoperative malnutrition, alcohol use disorder, and depression all independently predict postoperative complications.

Our research suggests that malnutrition in head and neck cancer patients should be screened with standardized tools like the MUST and treated in order to prevent postoperative complications.

References

- Yanni A, Dequanter D, Lechien JR, Loeb I, Rodriguez A, Javadian R, Van Gossum M. Malnutrition in head and neck cancer patients: Impacts and indications of a prophylactic percutaneous endoscopic gastrostomy. *Eur Ann Otorhinolaryngol Head Neck Dis.* 2019 Jun;136(3S):S27-S33.
- Britton B, Clover K, Bateman L, Odelli C, Wenham K, Zeman A, Carter GL. Baseline depression predicts malnutrition in head and neck cancer patients undergoing radiotherapy. *Support Care Cancer.* 2012 Feb;20(2):335-42.
- Righini CA, Timi N, Junet P, Bertolo A, Reynt E, Atallah I. Assessment of nutritional status at the time of diagnosis in patients treated for head and neck cancer. *Eur Ann Otorhinolaryngol Head Neck Dis.* 2013 Feb;130(1):8-14.
- Chao PC, Chuang HJ, Tsao LY, et al. The Malnutrition Universal Screening Tool (MUST) and a nutrition education program for high risk cancer patients: strategies to improve dietary intake in cancer patients. *Biomedicine (Taipei).* 2015;5(3):17.