

## Abstract

**Title:** Frailty patients who are candidates for major abdominal surgery: A retrospective analysis of factors that should be taken into account

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**Objective:** Frailty remains under-assessed, despite its impact on postoperative morbidity and mortality. Frailty was assessed using six items divided into three categories: 1. Nutritional status, 2. Body composition 3. Duke Activity Status Index score (DASI score), Six-Minute Walking Test (6MWT), Maximal Oxygen consumption (VO<sub>2</sub>max - derived from the 6MWT) and Handgrip strength.

**Background:** Prehabilitation enhances postoperative outcomes and recovery in high-risk patients undergoing major abdominal surgery, yet malnutrition, functional decline, and comorbidities increase surgical risk. [1-3] The anesthesia consultation may play a key role in identifying these vulnerabilities and initiating timely interventions.

**Methods:** The retrospective analysis of the institutional prehabilitation database was approved by the local ethics committee (B0392023000102, January 30, 2024, at CHU UCL Namur).

**Results:** Sixty-nine patients were identified: 18 were excluded, 51 were analyzed. Data were available for 44/51 patients (86.3%). Surgical procedures included esophagectomies (29/44; 65.9%), pancreatic surgeries (12/44; 27.3%) and hyperthermic intraperitoneal chemotherapy (HIPEC) (3/44; 6.8%) procedures. The mean patient age was 65.7 years (range: 30–83). An ASA II score was present in 30/44 patients (68,2%).

The six frailty items were analyzed:

Regarding nutritional status: Undernutrition was diagnosed in 9/44 patients (20.5%), and severe undernutrition in 18/44 patients (40.9%). Body composition was assessed using the muscle surface index derived from the analysis of the L3 section (CT scan): 23 patients (52.2%) available for analysis presented with sarcopenia. The DASI score analysis revealed that 27.6% of patients in the esophageal group had low physical activity (DASI score < 20), while 7.9% had moderate physical activity (DASI score 20–40), compared to 41.7% in the hepatobiliary group and 33.3% in the HIPEC group. The remaining patients had an adequate level of activity (DASI score > 40). Concerning the 6MWT, patients in all groups predominantly had values below 82% of the predicted value. Based on this test, VO<sub>2</sub>max was calculated. One patient in the pancreatic group and 3/29 patients (10.3%) in the esophageal group had a VO<sub>2</sub>max value below 20 ml/kg/min indicating greater vulnerability to postoperative complications. Concerning the handgrip strength, 5/29 patients (17.2%) in the esophageal group and 3/12 patients (25%) in the pancreatic group had a value less than or equal to the minimum required threshold. Functional assessment is illustrated in Table 1.

**Conclusion:** Our results highlight the extreme frailty of the studied population. Anesthesiologists are thus uniquely positioned and play a pivotal role to detect those high-risk patients, enabling targeted interventions (prehabilitation).

**Declaration of interest :** The authors declare no conflict of interest.

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**Table 1:** Functional data according to the surgery.

	Esophageal surgery (n=79)	Pancreatic surgery (n= 12)	HIPEC <sup>1</sup> surgery (n=3)
<b>DASI<sup>2</sup></b>			
Indeterminate	6 (6,9 %)	4 (33,3%)	1 (33,3%)
10-20	8 (27,6%)	-	-
20-30	4 (13,8%)	3 (25%)	-
30-40	7 (24,1%)	2 (16,7%)	1 (33,3%)
40-50	3 (10,3%)	1 (8,3%)	1 (33,3%)
50-60	1 (3,4%)	2 (16,7%)	-
<b>6 min. walking test (% of expected values)</b>			
≥ 82%	4 (13,8%)	5 (41,7%)	1 (33,3%)
< 82%	25 (86,2%)	7 (58,3%)	2 (66,7%)
<b>VO<sub>2</sub>max calculated based on the 6MWT<sup>3</sup> (ml/kg/min)</b>			
≤ 11	-	-	-
>11 - <14	-	-	-
14-20	3 (10,3%)	1 (8,3%)	-
21-30	15 (51,7%)	4 (33,3%)	1 (33,3%)
31-40	9 (31,1%)	7 (58,3%)	2 (66,7%)
41-50	2 (6,9%)	-	-
<b>Handgrip strength (% of the minimum expected value)</b>			
50-75	2 (6,9%)	1 (8,3%)	-
76-100	3 (10,3%)	2 (16,7%)	-
101-150	12 (41,4%)	4 (33,3%)	-
151-200	5 (17,2%)	-	-
201-250	1 (3,4%)	1 (8,3%)	-
251-300	-	1 (8,3%)	2 (66,7%)
>300	-	-	1 (33,3%)
Indeterminate	6 (20,7%)	3 (25%)	-

<sup>1</sup> HIPEC : Hyperthermic intraperitoneal chemotherapy

<sup>2</sup> DASI : Duke Activity Status Index score

<sup>3</sup> 6MWT : 6-Minute Walking Test