CHAPTER – 18

Frailty and Emergency Surgery

Background:

An increasing proportion of senior adults are being admitted to the emergency room with urgent surgical needs. This demographic group has poor surgical results, with high rates of postoperative complications, death, resource utilization, and a higher likelihood of being dependent on others upon discharge from the hospital. As a result of preoperative deconditioning and/or postoperative difficulties, emergency surgery can also cause functional deterioration.[1] The most dreaded postoperative event among senior patients is the loss of preoperative capacities such as mental ability, continence, mobility, or independence in daily activities, which could result in the need for immediate caregiver help or admissioninto a nursing facility.

Frailty is the most major risk factor for functional decline. In a busy emergency room, where a frailty assessment is not available or reliable, the surgeon has limited tools to estimate postoperative functional loss.[2] Therefore, certain frailty assessment tools can be used to evaluate the status of the patients before performing any emergency surgery.

Frailty assessment tools for emergency surgeries:

In the case of general surgery, it has been shown that a detailed multidisciplinary preoperative assessment of senior patients improves postoperative outcomes in the elective environment, but it is unquestionably worthwhile to assess the frailty status in the case of older patients having urgent treatment requirements. It is self-evident that in such cases, the decision-making process should be preceded by an accurate and less time-consuming assessment, especially if we are dealing with

a frail patient who is weakened by comorbidities.

The Emergency Surgery Frailty Index (EmSFI):[3]

EmSFI represents a valid simple instrument to perform preoperative evaluations with moderate accuracy, improving perioperative risk management in elderly patients. This index allows to stratify patients in three risk classes according to the developed index: EmSFI 1–3: low-risk class; EmSFI 4–7: moderate-risk class; EmSFI: 8–14 high-risk class (Figure 1).

Emergency Surgery Frailty Index (EmSFI)

Variable	Absent		Present
Age ≥ 80 years	0		1
Emergency	0		1
SIRS	0		1
Malignancy	0		1
	Absent	Mild	Severe
Chronic cardiopathy	0	1	2
Chronic pneumopathy	0	1	2
Other comorbidities	0	1	2
Altered autonomy	0	1	2
Altered mobility	0	1	2
Maximum score = 14 points			

Figure 1: Variables for calculating Emergency Surgery Frailty Index [3]

Flemish version of the Triage Risk Screening Tool (fTRST):[4]

Flemish version of the Triage Risk Screening Tool (fTRST), is a validated 5-item frailty screening tool that is effective in predicting 30- and 90-day morbidity and mortality after

emergency abdominal surgery among older patients (≥70 years). fTRST is based only on five domains and the total score can range from 0−6 (Figure 2).

1. Presence of cognitive decline - 2 points.

2. Living alone or no help from partner/family available - 1 point.

3. Reduced mobility or falls in the past 6 months - 1 point.

4. Hospitalized in the past 3 months - 1 point.

5. Polypharmacy (≥ 5 different medications) - 1 point.

This index also incorporates the Clavien-Dindo (CD) classification. CD classification is widely used to evaluate adverse events (complications) that occur after surgery (range I–V), was used to track all complications that occurred during the hospital stay or within 90 days following release. A serious complication was defined as a grade of III or higher.

Item	Score	
	Yes	No
Presence of cognitive impairment (disorientation, diagnosis of dementia, or delirium)	2	0
Lives alone or no caregiver available, willing, or able	1	0
Difficulty with walking or transfers or fall (s) in the past 6 months	1	0
Hospitalized in the last 3 months	1	0
Polypharmacy: ≥5 medications	1	0

Figure 2: Flemish version of the Triage Risk Screening Tool (fTRST) [5]

fTRST is a simple screening test with a lot of potential for identifying patients who have a 'geriatric profile' and could benefit from a more thorough geriatric evaluation. The first exploratory investigation of 55 older cancer patients found that the Flemish version of the TRST is a fairly accurate instrument when employing a cut-off score of 1.[5]

Emergency general surgery frailty index (EGSFI):[6]

The EGSFI is a 15-variable validated bedside instrument for determining the frailty state of individuals undergoing emergency general surgery (EGS). In geriatric EGS patients, frail state as defined by the EGSFI is an independent predictor of surgical complications and mortality. This could be a useful tool for making informed decisions, allocating hospital resources efficiently, and identifying chances for early intervention in high-risk frail patients.[6]

EMERGENCY GENERAL SURGERY SPECIFIC FRAILTY INDEX					
Co-Morbidities					
Cancer	Yes (1)		No (0)		
Hypertension	Yes (1)		No (0)		
Coronary heart disease	MI (1)	CABG (0.75)	PCI (0.5)	Medication (0.25)	No (0)
Dementia	Mild (0.25)	Moderate (0.5)	Severe (1)	No (0)	
Daily Activities					
Need help with grooming	Yes (1)		No (0)		
Help managing money	Yes (1)		No (0)		
Need help with housework	Yes (1)		No (0)		
Need help toileting	Yes (1)		No (0)		
Help walking	Wheel chair (1)	Walker (0.75)	Cane (0.25)	None (0)	
Health Attitude					
Feel less useful	Most of time (1)	Sometime (0.5)	Rarely (0)		
Feel sad	Most of time (1)	Sometime (0.5)	Rarely (0)		
Feel effort to do everything	Most of time (1)	Sometime (0.5)	Rarely (0)		
Feel lonely	Most of time (1)	Sometime (0.5)	Rarely (0)		
Feel sexually active	Yes (0)		No (1)		
Nutrition					
Albumin	<3 mg/dl (1)		>3mg/dl (0)		

Figure 3: Emergency general surgery frailty index (EGSFI) [6]

The relationship between frailty, and morbidity and mortality in emergency general surgery (EGS):

Frailty's impact on morbidity and mortality following elective operations has been well investigated; however, its role in poor postoperative outcomes following EGS has only recently been confirmed. This can be explained in part by the recent standardized definition of EGS, which includes seven operations that account for the vast majority of EGS operative load. The risk of complications and death, on the other hand, varies substantially between various operations. Appendectomy and cholecystectomy, for example, have significantlylower morbidity and fatality rates than the others, although accounting for the majority of cases.

Frailty was discovered in the acute general surgery population in a prospective study conducted by Goeteyn J et al in 2017.[7] Frailty was prevalent (23.5%) in the acute general surgery group aged 65 and up, according to this study that evaluated the Belgian population. Frailty was also linked to a higher risk of death at 30 and 90 days postoperatively. These findings should alert physicians to the fact that there are weak individuals out there who are more likely to develop problems and perish. The study concluded that this information could lead to a more aggressive or palliative response when a patient is examined in an emergency medical care unit.[7]

Kennedy CA and co-authors conducted a systematic review and meta-analysis assesses the correlation between frailty and EGS.[8] This review suggested that there is compelling evidence that frailty in the elderly predicts post-operative mortality, complications, a longer hospital stay, and loss of independence. Moreover, in the perioperative pathway, collaborative working with medicine for the elderly physicians to target modifiable components of the frailty syndrome may enhance results. The authors also added that, in order to aid decision-making and the development of novel postoperative strategies, frailty scoring should be integrated into acute surgical assessment practise.[8] This study also gave the followed points (Table 1).

Table 1: Frailty and Emergency General Surgery[8]

Few important points to know regarding the association between frailty and EGS:

Populations are ageing, as are the number of patients who require emergency surgery.

The prevalence of frailty amongst patients undergoing emergency surgery was 29.2%.

The mortality rate amongst the frail undergoing emergency general surgery was 24.7%.

Hewitt J et al in 2019 conducted an observational study that evaluated frailty amongst all ages and the correlation of the same with the outcome of emergency surgeries. [9] The cohort study included 2,279 patients and frailty was documented in patients of all ages. The detailed percentage of the age groups affected with frailty was 1% in patients under 40 years of age to 45% of those aged 80 years and above. The authors found that each incremental step of worsening frailty was associated with an 80% increase in mortality at Day 90. This finding supports a linear dose–response relationship. Additionally, the authors also found that the frailest patients were increasingly likely to stay in hospital longer, be readmitted within 30 days, and die within 30 days.[9]

Shinall Jr MC et al in 2020 conducted a study to analyse the association of preoperative frailty and operative stress with the mortality rate after any elective or emergency surgical procedure. [10] All the patients were categorized into robust, normal, frail, and very fail groups based on the RAI score (RAI 20, 21-29, 30-39, and 40, respectively for each of the above-mentioned groups). The outcomes measure was the rate of mortality noted in these groups at 30, 90, and 180 days.The study found that mortality was higher following emergency surgeries than after any elective operations, and that frail and very frail patients died at a higher rate than their more robust peers even after scheduled surgery.[10]

Association between mortality and frailty in emergency general surgery was examined in a systematic review and meta-analysis by Fehlmann CA et al in 2021.[11]The purpose of

this review was to determine the association between frailty and mortality among adults≥65 years old undergoing EGS. The results of this systematic review suggested that in adults of 65 years and above, frailty is linked to poorer outcomes following any EGS. Furthermore, the Clinical Frailty Scale could be used to improve patient risk assessment and collaborative decision-making with healthcare providers prior to surgery. Additionally, the authors added that the Clinical Frailty Scale's value in establishing a prognostic score in EGS should be investigated further in the future.[11]

Summary:

After elective operations of any level of operating stress, frail and very fragile patients experience significant postoperative mortality, with considerably greater rates of mortality after emergent operations. Mortality demonstrated a complex, nonlinear relationship with surgical stress for both emergent and elective surgeries, implying selection effects by operating surgeons.

The necessity for frailty assessment at the point of treatment in order to achieve critical goals such as risk-stratifying patients for surgeries, particularly those considered routine or low risk. Furthermore, there is a need to assist clinicians and frail patients in making informed surgical decisions, including palliative treatments, in both elective and emergency settings. When possible, the assessment tool should also provide guidelines for optimising preoperative care for these individuals. Additionally, it must also provide goal-concordant care, which may entail operating even when the risk of death is high if significant gains in quality of life are projected.

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