

Chapter 28

Geriatric Emergency Surgery

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28.1 Introduction

Due to the progress in health and safety of living, elderly population is increasing worldwide. The rate of aged persons will accumulate in both developing and developed countries over the next decades. Currently, there are an estimated one billion people aged >60 years worldwide, and this is projected to increase to over two billion by year 2050, with a more than two- to three-fold increase in developing countries [1]. Associated with this change in demography comes also increased health care costs, added complexity in care and higher morbidity and mortality, in particular for patients presenting with emergency surgery conditions [2–4]. Thus, this chapter will give a brief overview of

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issues in geriatric emergency surgery care that need to be taken into account by the surgeon.

28.2 Aging and Medical Conditions

With increasing age comes also an increased risk or susceptibility for certain diseases, including those that follow with added comorbidity, use of drugs and lifestyle risk factors. In most of the emergency general surgery conditions, the mortality also increases severalfold with each decade of age [5]. The biology of aging and its molecular hallmarks have been reviewed previously [6]. For surgeons it is of paramount importance to acknowledge that aging comes with specific concerns and added physiological challenges to specific organ systems and for the capacity to recover after an insult [7].

28.2.1 Role of Comorbidity

A number of preexisting comorbidities in the elderly presenting with an acute condition leads to increased postoperative complications and death [8]. A decreased cardiovascular and pulmonary reserve capacity results in tissue hypoxia that can be hard to detect. In the elderly, cardiogenic shock is often occult with a normal measured blood pressure due to stiff vessels and high vascular resistance [8] and shock (or hypoperfusion) starts at a higher blood pressure levels than in the young patient [9].

28.2.2 Renal Function and Reserve

Renal failure is also common and can be hard to detect due to the decreased muscle mass and creatinine levels in the

elderly, making creatinine an unreliable predictor of renal function. Renal failure complicates hydration, medication dosage, and precludes the use of many commonly used drugs. Indeed, as such renal failure is associated with mortality [10].

28.2.3 *Nutritional Status*

Protein and caloric undernutrition is also prevalent, and the catabolic state associated with critical illness predisposes to rapid wasting, infections, and increased morbidity and mortality. This warrants early focus on nutritional support [8].

28.2.4 *Cardiovascular Events and Drugs*

Also surgery in the elderly is associated with postoperative complications like atrial fibrillation, myocardial ischemia, and respiratory failure. Coagulopathy is also common due to frequent use of warfarin and antiplatelet drugs in these patients [8].

28.2.5 *Risk of Delirium*

Postoperative delirium presents in about 10% of patients after elective surgery and doubles to about 20% after emergency surgery. Delirium is often underdiagnosed and it may delay rehabilitation.

Guidelines for prevention and improved treatment of delirium [11] advocate use of interdisciplinary teams, mobility and walking, avoiding restraints, sleep hygiene, and adequate nutrition, fluid, and oxygen. Postoperative pain control (preferably without opioids) is important for prevention.

28.3 Emergency Conditions for an Aging Population

Specific disease patterns emerge with increasing age. For example, the risk of fractures increases with age, and age- and gender-specific patterns demonstrate types, complexity, and need for operative treatment for long-bone fractures [12]. Further, risk of ruptured abdominal aortic aneurysms (rAAA) also demonstrates an age-specific increase [13], as does the risk of perforated peptic ulcer [14].

28.4 Assessment of Frailty in the Elderly and Risk Scores

With an aging population, it is necessary to find tools to evaluate risks for morbidity and mortality related to emergency surgery. The concept of *frailty* is described as “a state of reduced physiological reserve associated with increased susceptibility to disability” [15]. Frailty has been associated with worse outcome after surgery [16]. Frailty can be seen as a biological syndrome of decreased reserve or, as an accumulation of deficits in terms of medical, social, and functional deficits [16]. No available scores exist for the emergency setting. Existing scores have been investigated, but these either fail to predict accurately the outcome or they are cumbersome to use in a clinical setting. Scores developed for elective evaluation have been investigated for emergency abdominal surgery [17]. Among the six instruments, the Vulnerable Elders Survey (VES-13) predicted the 30-day mortality and morbidity best. In general, mortality increase with increasing age, higher ASA score, need for emergency procedures, and for palliative surgery associated with a malignancy [18]. Thus, the use of documented variables together with a clinical acumen are the best predictors at present.

28.5 Organization of Geriatric Emergency Services

Indeed, treatment elderly, frail patients is complicated, and organizing the treatment of geriatric patients has been a topic of debate. Specialized geriatric surgical units have been proposed as a solution [19]. Further, elderly surgical patients experience failure-to-rescue events at much higher rates than their younger counterparts, particularly for infectious and pulmonary complications [20]. Increased attention to the role of organizational dynamics in hospitals' ability to rescue these high-risk patients will establish high-yield interventions aimed at improving patient safety [21].

28.5.1 Geriatric Units and Multidisciplinary Care

The core of geriatric units should be a multidisciplinary approach including all subspecialties of surgery, and nonsurgical specialist such as anaesthesiologists, geriatricians, pharmacist, nutritionist, and physiotherapists [19]. Together they should conduct preoperative assessment for frailty, comorbidity, and polypharmacy, allowing for optimal presurgery fitness, and postoperative rehabilitation.

Trauma units designed to expedite the care of geriatric patients through a multidisciplinary approach have been successful [22]. Criteria for triaging, disposition, and admission were established between emergency department and surgeons. Orthopedic surgeons implemented strategies of operative management in 48 h. Internal medicine assisted in optimizing chronic disease and providing preoperative clearance with involvement of cardiology and anesthesiology [22]. Multidisciplinary teams included surgeons, physical therapists, occupational therapists, respiratory therapists, nutritionists, pharmacists, social workers, case managers, internists, a geriatrician, and physical medicine

and rehabilitation for optimal and seamless care. A dedicated unit was established in the hospital, with a dedicated paging system. The geriatric trauma unit contributed to improved triage, improved quality of care, and safer discharge [22, 23].

28.6 Ethics, Limitations, and Boundaries for Geriatric Emergency Surgery

Some elderly patients with considerable comorbidity have a very poor prognosis with very limited chances for a functional recovery after an emergency surgery condition [24]. While the technical indication for surgery may be obvious, the overall approach to the specific patient may need a more differentiated approach [25]. Futility (defined as a very poor chance for survival or chance for recovery, or extremely high risk of ending up with permanent end-organ support in a high-dependent unit) may sometimes be clearly defined, but most often becomes a borderline decision between ethics, clinical predictions, and patient communication, for which no solid evidence currently exists. The number and severity of other underlying condition(s), as well as the treatment alternatives and their consequences, is a complex picture to interpret. Understanding the differences between Do Not Resuscitate (DNR), palliative care, hospice care, and symptom management in patients at the end of life is a critical skill set that is essential to all surgical care [26, 27], but specifically for geriatric surgical care and in the emergency setting.

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