

Emergency laparoscopy in an ever-increasing geriatric population

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As global demographics shift toward an aging population, the number of geriatric patients presenting with acute surgical emergencies is on the rise. Emergency abdominal conditions such as bowel obstruction, perforations, and ischemia disproportionately affect older adults, necessitating timely surgical intervention. Traditional open surgery has been the standard in these scenarios, but the advent of laparoscopic techniques has introduced a compelling alternative. While the laparoscopic approach offers potential benefits, its application in the emergency geriatric population remains contentious, requiring a detailed understanding of risks, benefits, and patient selection criteria. To address this concern, an exploration of the role of laparoscopic surgery in this unique cohort, with specific reference to the National Emergency Laparotomy Audit (NELA) and current literature, is undertaken.

Emergency laparotomy, a cornerstone for managing critical intra-abdominal conditions, is fraught with risk in elderly patients. Factors such as diminished physiological reserve, multiple comorbidities, and frailty exacerbate surgical morbidity and mortality.¹ According to the NELA, which tracks outcomes for patients undergoing emergency laparotomy in the UK, nearly half of those experiencing these procedures are over 70 years old.² These patients often present with high NELA-predicted mortality scores, empha-

sizing the need for reasonable risk stratification and tailored management strategies.

Laparoscopic techniques offer several theoretical and demonstrated advantages over traditional open surgery, particularly in frail and elderly patients.^{2,3} These benefits include: i) reduced surgical trauma: laparoscopic surgery minimises the need for large incisions, reducing wound-related complications such as infections, incisional hernia occurrence, and wound dehiscence; ii) improved postoperative recovery: faster mobilisation, decreased analgesic requirements, and shorter hospital stays have been consistently reported;^{3,4} iii) lower rates of postoperative delirium: minimising the systemic inflammatory response may reduce the incidence of cognitive complications, a significant concern in the elderly.³

These advantages are particularly appealing in high-risk elderly patients, for whom minimising surgical insult is of high importance.

Despite its potential, laparoscopic surgery in emergencies poses unique challenges. Elderly patients often present with advanced disease states and multiple comorbidities. These factors, combined with a lower physiological reserve, complicate the creation and maintenance of pneumoperitoneum.^{2,3} Pneumo-peritoneum has been proven to negatively affect the cardiopulmonary system due to intra-abdominal pressure and metabolic hypercarbia. In the elderly population, an increased intra-abdominal pressure causes a reduction in functional residual capacity and increased alveolar dead space. This translates to post-operative concerns regarding reduced peak expiratory flow rate and forced vital capacity.⁵ Emergency conditions such as dense adhesions, perforations with significant contamination, or ischemic bowel may render laparoscopic approaches more technically challenging and time-consuming.³ A final consideration is that the successful implementation of laparoscopic techniques relies heavily on surgeon experience and access to advanced laparoscopic equipment, which may not always be available in emergency settings or less-resourced healthcare settings.^{2,3}

The evidence for laparoscopic surgery in emergency geriatric cases continues to evolve but is promising. Several studies have demonstrated comparable or superior outcomes with laparoscopy compared to open surgery: a systematic review analysing postoperative outcomes following emergency laparotomy reported that laparoscopic approaches were associated with reduced mortality and morbidity in select patients. Risk-adjusted mortality was reduced by as much as 19.1% in patients over 75 who had procedures completed laparoscopically in comparison to those completed as laparotomies.⁶ Data from NELA indicate that while open surgery remains the dominant approach in emergencies, the subset of patients undergoing laparoscopic procedures tends to have shorter hospital stays and lower postoperative complication rates.² However, the literature also underscores the need for careful patient selection. Laparoscopic surgery is most beneficial in cases amenable to minimally invasive techniques, such as localised perforations or uncomplicated bowel obstruction. In contrast, its utility is

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limited in cases of widespread peritonitis or hemodynamic instability, where rapid access and exposure are critical.^{2,7} This comparison of the pros and cons of the laparoscopic approach is best summarised by the World Society of Emergency Surgery (WSES), which has stated that laparoscopy as a first approach is beneficial in all stable emergency surgical patients, even if the final outcome is conversion to laparotomy.⁸

The NELA risk calculator is instrumental in guiding surgical decisions in geriatric patients. By integrating factors such as age, comorbidities, physiological parameters, and operative urgency, the score provides a robust prediction of 30-day mortality.² This allows clinicians to balance the risks of surgery against the potential benefits, facilitating discussions about goals of care with patients and their families.

In the context of laparoscopy, the NELA score can help identify patients who might benefit most from a laparoscopic approach. For example, elderly patients with moderate risk scores may derive significant recovery advantages from laparoscopy, while those with very high scores might require more conservative or palliative approaches.^{2,3} The surgeon, unfortunately, cannot rely solely on tools such as risk calculators. The American College of Surgeons (ACS) National Surgical Quality Improvement Program (NSQIP) has been shown to have a poor correlation with outcomes in the elderly population in the context of elective surgery^{9,10} and limited review of mortality in the context of emergency laparoscopic surgery.

Beyond survival, quality of life (QoL) is a critical outcome for elderly patients undergoing emergency surgery. Studies suggest that while QoL often declines in the immediate postoperative period,¹¹ patients undergoing laparoscopic procedures tend to recover baseline physical and social functions more rapidly than those undergoing open surgery.³ These findings underscore the importance of incorporating QoL metrics into decision-making frameworks for geriatric surgical care.

The broader adoption of laparoscopic techniques in emergency geriatric surgery requires addressing several barriers, the most important of which is the recurrent theme of surgeons performing laparotomy out of routine or accepted practice. A study of NELA from 2013 to 2018 found that surgeons in the UK opted for laparotomy in the repair of perforated peptic ulcer in 78% of all cases, irrespective of demographics.¹² There is evidence of improving trends in favour of laparoscopy, however. In the USA, more than 80% of all index presentations for acute cholecystitis receive laparoscopic surgical intervention¹³, but these trends have not yet made their way to conditions such as peritonitis or small bowel obstruction and most certainly not to the geriatric population.

Conclusions

Laparoscopic surgery is a resource worth exploring in the context of the pathway for managing emergency surgical cases in the geriatric population. While not universally applicable, its benefits in select cases (reduced morbidity, faster recovery, and improved QoL) are compelling. The integration of tools like the NELA score into clinical pathways ensures that patient-centred, evidence-based decisions are made, maximising the potential of this laparoscopic approach.

Based on recent literature, there is a clear consensus that laparoscopic surgery is a safe and viable option in the setting of emergency surgery, including the care of the geriatric population.^{1,4,8} However, its adoption within the surgical community is the limiting factor. The authors' aim is to shed light on this research to allow colleagues the opportunity to shift the doctrine of laparotomy in emergency surgery to include a pragmatic consideration of laparoscopic approaches in suitable patients.

Future research should focus on prospective trials and the development of guidelines to standardise its application in this vulnerable cohort.

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