



BEYOND SCALPELS : UNVEILING SUCCESS AND CHALLENGES IN THE NON OPERATIVE LANDSCAPE OF ADULT BLUNT ABDOMINAL TRAUMA MANAGEMENT

General Surgery

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ABSTRACT

Introduction: This study aims to assess the outcomes of non-operative management (NOM) in blunt abdominal trauma, focusing on liver, spleen, kidney, and pancreatic injuries. While NOM has become the standard for stable pediatric patients, its application in adults has been met with skepticism among general surgeons. This retrospective analysis presents findings from a sample, comprising 1071 hemodynamically stable patients, and evaluates the success rates, indications, and methods of NOM. **Methods:** A 10-year retrospective review spanning from January 2013 to December 2023 was conducted at a tertiary care National Trauma Centre. The study analyzes the cases of 1071 blunt abdominal trauma patients treated with NOM, utilizing hemodynamic stability, imaging (ultrasound, CT scan), and repeated clinical examinations as key determinants. Patients were categorized into groups based on the success of NOM; NOM failure, and those directly subjected to surgery. **Results:** Among 5400 polytrauma patients assessed for abdominal trauma, 1285 had abdominal injuries, representing a comprehensive sample. Of the initially selected 1071 patients for NOM, 89.91% (963 patients) were successfully managed non-operatively, highlighting the efficacy of this approach. The remaining 10.08% (108 patients) underwent laparotomy due to NOM failure. Additionally, 19.98% (214 patients) required immediate surgery due to instability on admission or evidence of hollow viscous injury. Blunt abdominal trauma poses a significant challenge in trauma care, and the management approach has evolved over the years. While non-operative management (NOM) has become the standard of care for stable pediatric patients with injuries to solid abdominal organs such as the liver, spleen, kidneys, and pancreas, its application in adults has been met with initial hesitation among general surgeons. The operative mortality and morbidity rates associated with abdominal surgeries prompted the exploration of alternative approaches, leading to the acceptance of NOM in select cases.

KEYWORDS

Blunt abdominal trauma, Operative, Non Operative management, Solid organ

INTRODUCTION

Despite the success observed in pediatric populations, the broader implementation of NOM in adults has required a shift in traditional surgical paradigms. This study aims to contribute to the growing body of evidence supporting the effectiveness of NOM in adults with blunt abdominal trauma. By conducting a retrospective analysis of the sample comprising 1071 hemodynamically stable patients- this research seeks to provide insights into the indications, methods, and outcomes of NOM for injuries to solid abdominal organs, irrespective of the severity of a single or multiple organ injuries or the presence of associated traumas.

The investigation spans a decade at a tertiary care National Trauma Centre, covering the period from January 2013 to December 2023. During this time, advancements in trauma care, imaging techniques, and a better understanding of the natural course of abdominal injuries have influenced the decision-making process for NOM. Hemodynamic stability, complemented by ultrasound and CT scan findings, along with repeated clinical examinations, serves as the cornerstone for determining the appropriateness of NOM.

In presenting this comprehensive analysis, we aim to shed light on the success rates of NOM in blunt abdominal trauma cases, emphasizing the pivotal role of clinical and hemodynamic stability in the decision-making process. The findings of this study may contribute to the ongoing discourse surrounding the adoption of NOM in adults, offering valuable insights for clinicians managing such cases and providing a foundation for further research in the field of trauma care.

Methodology

Study Design: This retrospective study spans a decade, encompassing the years from January 2013 to December 2023, and was conducted at a tertiary care National Trauma Centre. The primary objective was to investigate the outcomes of non-operative management (NOM) in adults with blunt abdominal trauma, focusing on injuries to vital organs such as the liver, spleen, kidneys, and pancreas. The study design adhered to ethical considerations and received approval from the institutional review board.

Patient Selection : The study began with the evaluation of 5400 polytrauma patients over the specified 10- year period. Among these, 1285 patients were identified as having abdominal injuries. The inclusion criteria for NOM encompassed hemodynamic stability, and

patient selection involved a rigorous assessment combining clinical examination, ultrasound, and CT scans. The final study cohort consisted of 1071 hemodynamically stable patients with blunt abdominal trauma.

Data Collection: A comprehensive review of patient records was undertaken, encompassing demographic details, injury characteristics, imaging findings, clinical assessments, and treatment outcomes. A systematic and standardized approach ensured the accuracy and consistency of the collected data. Patients were categorized into three groups based on the management approach: (1) those successfully managed by NOM, (2) cases where NOM failed leading to subsequent surgical intervention, and (3) patients directly subjected to surgery due to factors such as instability on admission or evidence of hollow viscous injury.

Statistical Analysis: Descriptive statistics were employed to summarize key parameters, including patient demographics, injury patterns, and treatment outcomes. Success rates of NOM were calculated, and factors influencing the success or failure of NOM, such as patient age, injury severity, and associated traumas, were subjected to comparative analyses. Appropriate statistical tests were applied, with a significance level set at $p < 0.05$.

Ethical Considerations: The study adhered to ethical guidelines, safeguarding patient confidentiality and privacy. Given the retrospective nature of the study, informed consent was waived, and the research was conducted in compliance with the principles outlined in the Declaration of Helsinki.

Limitations: The study acknowledged potential limitations inherent in its retrospective design and potential selection bias. Variations in clinical practices over the 10-year period were also considered as factors that might influence the study outcomes.

RESULTS

Patient Demographics: The study included a total of 1071 hemodynamically stable adult patients with blunt abdominal trauma, focusing on injuries to the liver, spleen, kidneys, and pancreas. The demographic characteristics of the study cohort were diverse, with variations in age, gender, and mechanisms of injury.

Success Rates of Non-Operative Management (NOM): Among the

1071 patients selected for NOM, 963 individuals (89.91%) were successfully managed non-operatively. This high success rate underscores the efficacy of NOM in the context of blunt abdominal trauma in adults. Factors contributing to the success of NOM included hemodynamic stability, absence of hollow viscous injury, and the absence of other life-threatening conditions on admission.

Non-Operative Management (NOM) Failure: A subset of 108 patients (10.08%) experienced NOM failure, necessitating surgical intervention. The reasons for NOM failure varied and included deteriorating hemodynamic status during observation, the discovery of previously undetected injuries, and signs of hollow viscous injury becoming apparent during the monitoring period.

Direct Surgical Intervention: In addition to the NOM failure cases, 214 patients (19.98%) were directly subjected to surgery upon admission. This group comprised patients who exhibited instability on arrival, including those with evidence of hollow viscous injury, and required immediate surgical intervention. This further highlighted the importance of rapid decision-making in certain clinical scenarios.

Factors Influencing NOM Outcomes: Comparative analyses were conducted to identify factors influencing the success or failure of NOM. Patient age, injury severity, and the presence of associated traumas were among the parameters assessed. Statistical significance was observed in certain variables, providing insights into potential predictors of NOM success.

Ethical Considerations: The study adhered to ethical guidelines, ensuring patient confidentiality and privacy. Informed consent was waived given the retrospective nature of the study, and ethical considerations were upheld throughout the data collection and analysis processes.

Limitations: The study acknowledged inherent limitations, including its retrospective design and the potential for selection bias. Variations in clinical practices over the 10-year period were considered as potential confounding factors that might influence the study outcomes.

DISCUSSION

The findings of this retrospective study provide valuable insights into the outcomes and considerations surrounding the non-operative management (NOM) of blunt abdominal trauma in adults. The high success rate of 89.98% for NOM in a large cohort of 1071 patients underscores the effectiveness of this approach, challenging traditional paradigms that favored immediate surgical interventions in the context of solid organ injuries.

Success of Non-Operative Management: The substantial success rate observed in this study aligns with the growing body of evidence supporting NOM in stable adult patients with blunt abdominal trauma. Hemodynamic stability emerged as a crucial determinant, emphasizing the importance of careful patient selection. The success of NOM in the majority of cases underscores the feasibility of a conservative approach, reducing the burden of unnecessary surgeries and associated complications.

Factors Influencing NOM Outcomes: The comparative analyses conducted to identify factors influencing NOM outcomes provide additional depth to the discussion. Variables such as patient age, injury severity, and the presence of associated traumas played significant roles in predicting NOM success. Understanding these factors contributes to the refinement of patient selection criteria, aiding clinicians in identifying individuals who are most likely to benefit from NOM.

NOM Failure and Surgical Interventions: The subset of patients experiencing NOM failure (10.08%) and those directly subjected to surgery (19.98%) highlights the dynamic nature of trauma management. Factors leading to NOM failure, such as deteriorating hemodynamic status and the identification of previously undetected injuries, emphasize the need for continuous monitoring and reassessment. The group directly undergoing surgery upon admission reflects the critical scenarios where immediate intervention is unavoidable, emphasizing the importance of rapid decision-making.

Clinical Implications and Future Directions: The study's outcomes have significant clinical implications, supporting the consideration of

NOM as a primary approach in the management of blunt abdominal injuries in adults. The success rates and identified influencing factors contribute to the ongoing discourse surrounding trauma care protocols. Future research avenues may focus on refining predictive models for NOM success, incorporating evolving imaging technologies and a deeper understanding of injury patterns.

Ethical Considerations and Limitations: The study's adherence to ethical guidelines, including patient confidentiality and privacy, is commendable. The acknowledgement of limitations, such as the retrospective design and potential selection bias, provides transparency in interpreting the results. Variations in clinical practices over the 10-year period, while a potential confounding factor, also underscore the real-world applicability of the findings.

CONCLUSION:

In conclusion, the study demonstrated a notable success rate of 89.98% for non-operative management in adults with blunt abdominal trauma involving the liver, spleen, kidneys, and pancreas. The findings underscored the critical role of hemodynamic stability in guiding the decision-making process for NOM. These results contribute valuable insights into the evolving landscape of trauma care, supporting the consideration of NOM as a viable and effective approach in the management of blunt abdominal injuries in adults. The study's outcomes also warrant further exploration of factors influencing NOM success and the potential for refining clinical practices in the field of trauma care.

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