

Research Article

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Assessment of Adapted Clavien-Dindo Classification (ACDiT) as a Tool for Reporting and Grading Negative Outcomes in Acute Care Surgical Patients: A Prospective Study at a Tertiary Care Centre

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ABSTRACT

Background: Acute care surgery (ACS) encompasses emergency general surgery, trauma, surgical rescue, and critical care, all of which carry significant risk of complications. Mortality rates have declined with modern resuscitation and damage-control strategies, making non-fatal complications more meaningful outcome measures. The traditional Clavien-Dindo classification (CDC) has limitations in ACS, especially in non-operative management. The Adapted Clavien-Dindo in Trauma (ACDiT) scale addresses these gaps by incorporating trauma-specific modifications.

Aim: To assess the feasibility of using ACDiT for grading non-mortality complications across the spectrum of acute care surgical patients, and to evaluate its correlation with outcomes and critical care scoring systems.

Methods: A prospective observational study was conducted in the Department of Traumatology and Surgery at a tertiary care hospital. All ACS patients admitted during the study period, both trauma and non-trauma, were included. Complications were graded using the ACDiT system. Outcomes measured included hospital stay, ICU stay, and correlation with critical care scores. Statistical analyses were performed to determine associations between ACDiT grade and patient outcomes. Ethical clearance was obtained.

Results: A significant proportion of patients developed complications that could be systematically classified using ACDiT. Increasing ACDiT grades correlated with longer ICU stay, prolonged hospitalization, and adverse outcomes. The classification was applicable to both operative and non-operative cases, demonstrating feasibility in the heterogeneous ACS population. Higher complication grades were consistent with worse outcomes when compared with critical care scoring systems.

Conclusion: ACDiT is a feasible and reliable tool for grading complications in acute care surgery. It provides a standardized framework applicable to trauma and non-trauma cases, allows meaningful comparison of outcomes, and complements critical care scoring systems. Adoption of ACDiT can improve reporting quality, facilitate benchmarking across centres, and enhance quality improvement initiatives.

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Introduction

Acute Care Surgery (ACS) includes emergency general surgery, trauma care, surgical rescue, and surgical critical care. The complexity and heterogeneity of this patient population makes standardized reporting of outcomes challenging. Historically, mortality has been the primary measure of quality in ACS. However, with improved surgical techniques, critical care, and resuscitation protocols, survival rates have increased, shifting the focus toward non-fatal complications as meaningful quality indicators.

The Clavien-Dindo Classification (CDC) is one of the most widely adopted systems for grading postoperative complications. While

effective in elective surgery, it is less suitable for ACS due to its inability to address non-operative management and trauma-specific scenarios. The Adapted Clavien-Dindo in Trauma (ACDiT) scale was developed by trauma specialists in the UK and USA to overcome these limitations. It incorporates trauma-specific modifications, such as subdivision of mortality into palliative versus actively treated deaths, inclusion of permanent disability markers, and applicability to conservatively managed cases.

This study evaluates the feasibility of ACDiT in a tertiary care Indian setting, aiming to determine its utility in grading complications across the spectrum of ACS patients and its correlation with clinical outcomes.

Materials and Methods

Study design and setting: A prospective observational study was

conducted in the Department of Traumatology and Surgery at a tertiary care teaching hospital.

Patient selection

All patients admitted with acute care surgical conditions, both trauma and non-trauma, during the study period were included. Patients managed operatively and non-operatively were analyzed. Exclusion criteria were refusal of consent or incomplete records.

Data Collection

Each patient was evaluated for complications during hospitalization. Complications were graded using the ACDiT system (Grades I–V with trauma-specific adaptations). Mortality was subdivided into palliative (Va) and actively treated (Vb). Permanent disability was marked with a [P] suffix.

Outcome Measures

Primary outcomes were complication rates across ACDiT grades. Secondary outcomes included correlation of complication grade with length of hospital stay, ICU stay, and comparison with established critical care scores.

Ethical Approval

Institutional Ethics Committee clearance was obtained, and informed consent was taken from all participants.

Statistical Analysis

Data were analyzed using descriptive and inferential statistics. Correlations between ACDiT grades and outcome variables were calculated using appropriate tests (chi-square, ANOVA, Pearson correlation). A p-value <0.05 was considered significant.

Results

A wide spectrum of ACS patients was included, ranging from trauma cases to non-trauma emergency general surgery. Complications were consistently graded using ACDiT without ambiguity.

Incidence of Complications

A substantial proportion of patients developed complications, ranging from minor Grade I deviations to life-threatening Grade IV events. Mortality was observed and appropriately subclassified into palliative and therapeutic intent categories.

Correlation with Outcomes

Increasing ACDiT grade was significantly associated with longer ICU stay, extended hospitalization, and higher morbidity. Patients with low-grade complications had favorable recovery, whereas high-grade complications correlated with organ dysfunction and mortality.

Comparison with Critical Care Scores

The trend in outcomes with rising ACDiT grade paralleled critical care scoring systems, validating its predictive utility. Unlike conventional scores, ACDiT was applicable in non-operative management and provided greater clinical relevance for morbidity assessment.

Discussion

This study demonstrates the feasibility and applicability of ACDiT in an Indian tertiary care setting. By addressing limitations of the original CDC, ACDiT provides a comprehensive framework for complication grading across both operative and non-operative ACS cases.

The results are consistent with international literature where ACDiT has shown strong correlation with patient outcomes and quality indicators. Previous studies by Naumann et al. and Banerjee et al. validated ACDiT in trauma patients, highlighting its ability to capture morbidity beyond mortality. Our findings support these observations in a broader ACS cohort.

Clinical implications: Standardized complication grading improves transparency, facilitates benchmarking, and enhances quality improvement. ACDiT can be incorporated into morbidity and mortality meetings, trauma registries, and clinical research. It also offers utility in comparing outcomes across institutions and guiding resource allocation in critical care.

Strengths and limitations: Strengths of this study include its prospective design and application of ACDiT to a diverse ACS population. Limitations include single-centre setting and moderate sample size. Long-term outcomes beyond hospitalization were not assessed. Multicentre studies with larger cohorts are warranted [1-10].

Conclusion

The Adapted Clavien-Dindo in Trauma (ACDiT) classification is a feasible, reliable, and clinically meaningful tool for grading complications in acute care surgery. It captures morbidity across trauma and non-trauma patients, including those managed non-operatively, and correlates with critical care outcomes. Adoption of ACDiT can improve complication reporting, enable meaningful comparisons across centres, and support quality improvement in acute care surgery.

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