Evaluation of Triclosan-Coated Barbed Suture Following Emergency Laparotomy: A Multicenter Retrospective and Prospective Cohort Study

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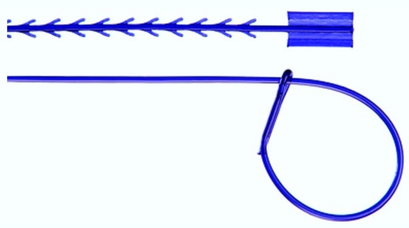
Introduction

Emergency exploratory laparotomy carries high risk of morbidity and mortality, primarily due to early complications such as fascial dehiscence and surgical site infection (SSI). These early complications can lead to longer-term issues, including incisional hernia, prolonged hospital length of stay, readmission, increased healthcare cost, and mortality. Thus, prevention of dehiscence and local infectious complications following emergency laparotomy remains a topic of academic and clinical importance.

To mitigate these risks, interest has focused on the suture type and technique use in fascial closure. Most published data on laparotomy closure techniques is derived from the elective surgical environment. But these findings do not fully translate to the unique challenges of emergency laparotomy.

Emergency laparotomy is performed under time-sensitive, high-stress conditions with patients who may be hemodynamically unstable, coagulopathic, hypothermic, or suffering from intra-abdominal contamination. These factors contribute to significantly higher risk of postoperative complications.

Beyond technique, the choice of suture material itself may significantly influence outcomes. Fascial closure using triclosan coated barbed (TCB) suture has shown reduction of local complications following elective laparotomy, but evidence in emergency laparotomy remains sparse.



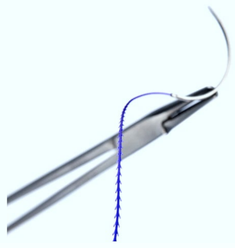
Why Triclosan?

Triclosan Barbed sutures have emerged as a promising alternative to conventional smooth monofilament sutures.

- The barbed design allows for even tension distribution without the need for knots, which can be potential sites of infection and mechanical weakness.
- Triclosan coating provides antimicrobial properties aimed at reducing bacterial colonization along the suture line, thereby decreasing the risk of SSIs.

Because TCB has shown promise in previous non-trauma studies, larger studies inclusive of the trauma and emergency general surgery populations are indicated to determine the true benefit. This study aims to address this knowledge gap by determining the benefit of fascial closure with TCB suture in emergency laparotomy through a robust multicenter analysis.



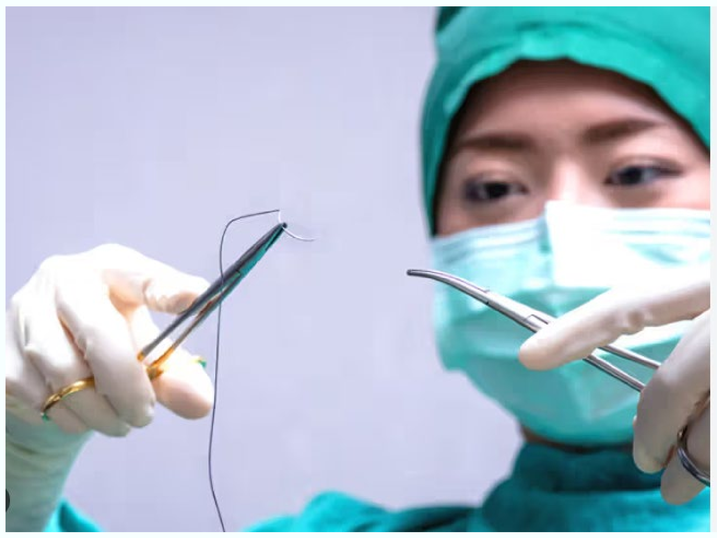


Aims

Aim 1: Compare the incidence of short-term incisional outcomes of emergency laparotomy fascial closure with TCB vs conventional non-barbed sutures.

Aim 2: Compare the incidence of long-term incisional outcomes of emergency laparotomy fascial closure with TCB vs conventional non-barbed sutures.

Hypothesis: The use of TCB suture will result in lower rates of fascial dehiscence, evisceration, and SSI compared to conventional non-barbed sutures.



Methods and Materials

This study will be a multicenter, prospectively collected observational study with a retrospective arm performed on patients undergoing emergent laparotomy for trauma and emergency general surgery. The retrospective arm will include patients collected over four years (January 1, 2021, to December 31, 2025).

The prospective observational arm will collect data on patients for the next year and will observe them for the next 12 months after fascial closure.

Study cohorts will be established based on the management of the initial fascial closure. Patients who were closed with TCB sutures will be compared to those patients whose fascia was closed with non-barbed sutures.

This study was approved by the Trinity Health IRB and is actively collecting data.

References and Acknowledgements