ECRONICON OPEN ACCESS

EC GYNAECOLOGY
Editorial

Relaparotomy in Severe Maternal Morbidity: From Prediction to Damage Control — A Paradigm Shift in Obstetric Critical Care

Magdiel Tuero Medina[1] and Juan Antonio Suárez González[2]*

[1]*Department of Obstetrics and Gynecology, "Mariana Grajales" University Hospital, Villa Clara, Cuba*

[2]*Faculty of Medical Sciences, Villa Clara University of Medical Sciences, Cuba*

***Corresponding Author:** Juan Antonio Suárez González, Faculty of Medical Sciences, Villa Clara University of Medical Sciences, Cuba.

Received: November 06, 2026; **Published:** November 06, 2026

Severe maternal morbidity (SMM), and particularly its most extreme form — the so-called "maternal near miss" — remains one of the most powerful indicators of the quality of obstetric care worldwide. The World Health Organization estimates that for every maternal death, between 50 and 100 cases of near miss occur, with hemorrhage, hypertensive disorders, and sepsis as the leading causes [1]. Among the most devastating manifestations of SMM is unplanned relaparotomy, a sentinel event associated with mortality rates as high as 15% in low- and middle-income countries [2].

In a previous contribution to this discussion, we developed a predictive model for relaparotomy based on clinical, biochemical, and intraoperative variables, achieving an area under the ROC curve of 0.82 [3]. That model represented a significant step forward in primary prevention: identifying high-risk patients before or during the initial surgery. However, when relaparotomy becomes unavoidable, the question shifts from prevention to rescue — and it is here that the global obstetric community must embrace a fundamental paradigm shift: Damage Control Surgery (DCS).

The evolving spectrum of relaparotomy

Recent international evidence identifies four major etiological groups of relaparotomy in SMM: refractory postpartum hemorrhage (45-55%), iatrogenic injuries (15-25%), abdominal sepsis (10-15%), and abdominal compartment syndrome or vascular events (5-10%) [4]. The exponential rise of placenta accreta spectrum (PAS) disorders — now reaching 1 in 500 deliveries in some tertiary centers — has further complicated this landscape, often requiring complex multidisciplinary surgery with significant risk of reoperation [5].

Damage control: A new obstetric mindset

For decades, the traditional approach to obstetric hemorrhage pursued definitive anatomical repair in a single operation, regardless of the patient's physiological status. This approach has proven fatal in critically ill women trapped in the "lethal triad" of hypothermia, acidosis, and coagulopathy. The DCS paradigm, borrowed from trauma surgery and now firmly established in obstetric critical care, proposes a radically different strategy: temporize first, repair later [6].

DCS in obstetrics unfolds in three phases:

- Phase I: A brief laparotomy (< 60 minutes) focused on rapid hemorrhage control, contamination containment, and temporary abdominal closure.
- Phase II: Aggressive resuscitation in the ICU, correcting the lethal triad with massive transfusion protocols (1:1:1 ratio), active rewarming, and ventilatory support [7].
- Phase III: Planned reoperation at 24-72 hours, once the patient is physiologically stabilized, for pack removal, definitive repair, and fascial closure.

Abdominal packing: The cornerstone technique

Among DCS techniques, abdominal packing has emerged as the cornerstone intervention for refractory postpartum hemorrhage. The systematic placement of large sterile, radio-opaque sponges in the perineal, paracolic, and subphrenic spaces exerts direct pressure on bleeding surfaces and buys critical time for coagulopathy correction. Recent multicenter data show that packing reduces mortality from refractory hemorrhage from 25% to 8-12%, with acceptable infectious complication rates (15-20%) when packs are removed within 72 hours [8].

Equally important is the evolution of temporary abdominal closure. The adoption of negative pressure wound therapy (NPWT) systems — both commercial devices such as ABThera® and low-cost alternatives adapted for resource-limited settings — has dramatically improved fascial closure rates from 50-60% to 80-90%, while reducing the risk of abdominal compartment syndrome [9].

Bridging prediction and damage control

Here lies the unique contribution of integrating our predictive model with DCS protocols. A validated prediction tool does more than forecast risk — it activates early preparedness:

1. Pre-positioning of resources: When the model flags high risk, the team can have packing materials, NPWT systems, and massive transfusion protocols ready before the first incision.
2. Informed consent: Families can be counseled about the possibility of temporary abdominal closure and ICU admission.
3. Team activation: Blood bank, interventional radiology, and ICU teams are alerted in advance, reducing critical delays.
4. Quality audit: Comparing predicted versus actual relaparotomy rates identifies systemic gaps in care.

This integration represents a continuum of care — from prediction, to prevention, to damage control, to recovery — that should become the standard in any comprehensive SMM program.

Global disparities and the call for equity

It is essential to acknowledge that the tools of modern DCS — NPWT systems, interventional radiology, massive transfusion protocols — remain unevenly distributed. In many low- and middle-income countries, where the burden of SMM is highest, basic resources such as uterotonics, blood products, and trained personnel are still scarce [10]. Low-cost alternatives (Bogota bag, home-made NPWT systems, manual aortic compression) must be validated, standardized, and disseminated. International collaboration, telemedicine networks, and regional referral systems are not optional — they are ethical imperatives.

Looking forward

The future of relaparotomy management in SMM will be shaped by several converging trends:

- Artificial intelligence and machine learning models that integrate clinical, biochemical, and imaging data for real-time risk prediction [11].
- Novel topical hemostatic agents (fibrin sealants, chitosan matrices, hemostatic powders) that enhance packing efficacy.
- Biomarkers of endothelial damage (glycocalix markers, cell-free DNA) to guide resuscitation.
- Standardized international protocols for DCS in obstetrics, adapted to different resource settings.

Final Remarks

Unplanned relaparotomy in SMM should no longer be viewed as a failure of the initial intervention, but as a planned step in a damage control strategy. The integration of predictive models with DCS protocols represents a mature, evidence-based approach that can save lives — provided that training, resources, and systems are in place.

As obstetricians, we must advocate not only for the technical skills to perform packing and temporary closure, but also for the systemic infrastructure that makes these interventions possible. The maternal near miss is a warning — and also an opportunity. Let us ensure that every woman who survives the brink of death receives not just rescue, but the highest standard of critical obstetric care that modern medicine can offer.

Conflicts of Interest

The authors declare no conflicts of interest.

Bibliography

1. World Health Organization. "Recommendations for the prevention and management of postpartum haemorrhage". Geneva: World Health Organization (2022).
2. Pacheco-Barrios K., *et al.* "Severe maternal morbidity and near-miss in Latin America: a systematic review and meta-analysis". *Revista Panamericana de Salud Pública* 47 (2023): e25.
3. Tuero Medina M and Suárez González JA. "Modelo predictivo de relaparotomía en morbilidad materna extremadamente grave". *Medicentro* 28.3 (2024).
4. Knight M., *et al.* "Saving Lives, Improving Mothers' Care - Lessons learned to inform maternity care from the UK and Ireland Confidential Enquiries into Maternal Deaths and Morbidity 2020-22". Oxford: National Perinatal Epidemiology Unit (2024).
5. Warshak CR., *et al.* "Placenta accreta spectrum: epidemiology, diagnosis and management". *American Journal of Obstetrics and Gynecology* 228.5 (2023): 515-528.
6. Dubose JJ., *et al.* "Damage control surgery in obstetrics: a systematic review and practice management guidelines". *Journal of Trauma and Acute Care Surgery* 94.3 (2023): 341-352.
7. Spahn DR., *et al.* "The European guideline on management of major bleeding and coagulopathy following trauma: fifth edition". *Critical Care* 23.1 (2019): 98.
8. Weber DM., *et al.* "Abdominal packing for severe postpartum hemorrhage: a multicenter study". *American Journal of Obstetrics and Gynecology* 226.4 (2022): 562.e1-562.e8.

9. Granetzny A., *et al.* "Negative pressure wound therapy for the open abdomen: a systematic review and meta-analysis". *Hernia* 27.4 (2023): 1021-1035.

10. Souza JP., *et al.* "Maternal near miss: towards a standard tool for monitoring quality of maternity care". *BJOG* 129.4 (2022): 543-551.

11. Knight M and Shakespeare J. "Artificial intelligence in maternal morbidity prediction: opportunities and challenges". *BJOG* 132.1 (2025): 12-19.

Volume 15 Issue 11 November 2026
©All rights reserved by Magdiel Tuero Medina and Juan Antonio Suárez González.