THE ROLE OF PREOPERATIVE BOTULINUM TOXIN INFILTRATION IN PRIMARY VENTRAL HERNIAS: A CASE SERIES WITHOUT ABDOMINAL WALL RECONSTRUCTION

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AIM

To evaluate the efficacy and safety of preoperative botulinum toxin type A (BTA) infiltration as an adjunctive measure in the management of primary ventral hernias, with the objective of achieving tension-free primary fascial closure without the need for formal component separation or complex abdominal wall reconstruction. This study aims to assess whether chemical denervation of the lateral abdominal wall musculature using BTA can facilitate improved fascial medialization, reduce intraoperative tension, and optimize postoperative outcomes in patients undergoing elective ventral hernia repair.

INTRODUCTION

Botulinum toxin type A (BTA) has emerged as an effective adjunct for achieving chemical separation, facilitating tension-free closure in complex ventral hernia repair. Its use has been associated with favorable outcomes in patients both with and without loss of domain.

This neurotoxic agent exerts its pharmacologic effect by inhibiting the presynaptic release of acetylcholine at peripheral cholinergic nerve terminals, thereby inducing a reversible flaccid paralysis of the targeted musculature. [1] Preoperative chemical denervation of the abdominal wall muscles using botulinum toxin type A (BTA) promotes elongation and thinning of the muscle fibers, which facilitates fascial medialization and tension-free approximation during abdominal wall reconstruction. The resulting increase in abdominal wall compliance may reduce the need for additional surgical myofascial release procedures. Moreover, by decreasing intra-abdominal pressure, the use of BTA has been associated with a lower risk of abdominal compartment syndrome, postoperative ventilatory compromise, prolonged ileus, and other pressure-related complications. [2,3]

MATERIALS AND METHODS

Two male patients were included in this case series. The first, aged 77, presented in September 2024 with a necrotic large umbilical hernia on a >10-year history of untreated hernia, initially managed with two debridements due to infection and thrombocytopenia **(Figures: 1a,b,c,d,e).** The second, aged 71, presented in March 2025 with three primary midline ventral hernias (epigastric and mid-abdominal). **(Figures: 2a,b,c,d,e,f).**

Both patients, preoperatively, received an ultrasound-guided transversus abdominis plane block, followed by injection of 300 EH Botox® at three levels (subcostal, mid-abdominal, supracrestal) across all abdominal wall layers (external oblique, internal oblique, transversus abdominis).

Elective abdominal wall reconstruction was performed 4–6 weeks post-infiltration under general anaesthesia. Patients underwent midline laparotomy where adhesiolysis was performed with reduction of protruding viscera, allowing complete mobilization of anterior abdominal wall. The reduced abdominal wall tension, that was noted, facilitated primary midline fascial closure with use continuous, single-layer small-bites technique with a slowly absorbable monofilament suture to achieve a suture length to wound length ratio of at least 4:1. Concomitant abdominoplasty was warranted to improve outcome.

RESULTS

Both patients exhibited favorable postoperative outcomes following preoperative chemodenervation with botulinum toxin type A and subsequent abdominal wall reconstruction. Intraoperatively, a notable reduction in abdominal wall tension was observed, facilitating primary midline fascial closure without the need for additional component separation techniques or mesh bridging. Estimated intraoperative blood loss was minimal and the duration of surgery remained within the expected range for complex ventral hernia repair.

No wound-related complications such as seroma, hematoma, or surgical site infection were observed. Drains were removed postoperatively and both patients were discharged in stable condition.

At short-term follow-up (8–12 weeks), both patients demonstrated satisfactory abdominal wall contour and integrity, with no evidence of fascial dehiscence or hernia recurrence. Functional recovery was complete, with both individuals resuming daily activities without discomfort or limitations.

CONCLUSIONS

Preoperative administration of botulinum toxin type A represents a safe, minimally invasive, and effective adjunct in the management of large or complex primary ventral hernias. By inducing temporary chemical denervation and functional lengthening of the lateral abdominal wall musculature, BTA significantly reduces myofascial tension, thereby enabling tension-free primary fascial closure without the need for formal component separation.

In this small case series, the technique facilitated adequate medialization of the rectus complex and achieved stable fascial approximation, while minimizing intraoperative blood loss and postoperative morbidity. Furthermore, the use of BTA appears to contribute to improved abdominal wall compliance, reduced postoperative pain, and enhanced functional recovery. These findings support the growing evidence that preoperative chemodenervation with botulinum toxin can optimize surgical conditions and outcomes in ventral hernia repair, potentially decreasing the need for more extensive reconstructive procedures. Larger prospective studies are warranted to validate these encouraging preliminary results and define standardized protocols regarding dosage, timing, and injection technique.

Figure 1a. Necrotic large umbilical hernia (untreated hernia more than 10 years) .

Figure 1b. 1st Debridement.

Figure 1c. 2nd Debridement.

Figure 1d. Preoperative image obtained after BTA infiltration. (4-6 weeks ago).

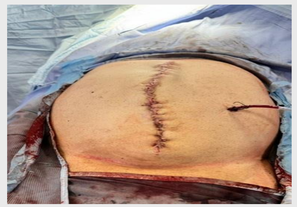

Figure 1e. Postoperative image.

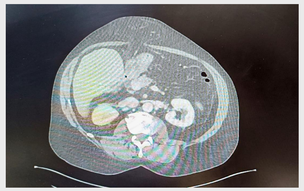

Figure 2a. CT: Anatomical location: midline epigastrium (Sac content: fat only)

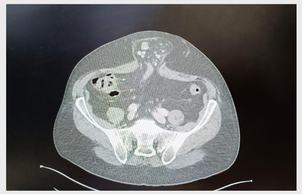

Figure 2b. CT: Anatomical location: mid abdomen, above largest inferior hernia (Sac content: fat only)

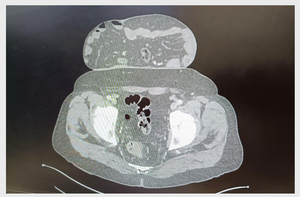

Figure 2c. CT: Anatomical location: inferior border 12.2cm from pubic symphysis, superior border 21.5cm from xiphisternum (Sac content: most of the small bowel)

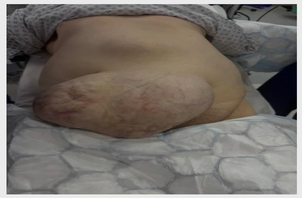

Figure 2d. Preoperative image obtained after BTA infiltration. (4-6 weeks ago).

Figure 2e. Postoperative image.

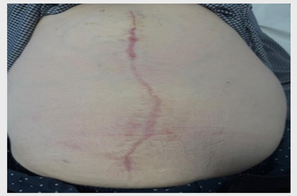

Figure 2f. Short-term follow-up (8-12 weeks)

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