PREOPERATIVE CHEMICAL COMPONENT SEPARATION WITH BOTULINUM TOXIN A IN THE TREATMENT OF PARAESOPHAGEAL HERNIA PATIENTS

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INTRODUCTION

BTA is a neurotoxin produced by the bacterium Clostridium botulinum, which has an inhibitory effect on presynaptic cholinergic nerve terminals. Treatment of a muscle with BTA results in functional muscular denervation within two days and has a peak effect after approximately two to four weeks.

Benefits of chemical component separation with BTA for abdominal wall reconstruction include:

- Facilitating fascial closure
- Decreasing intraabdominal pressure associated with fascial closure
- Decreases post operative pain
- Decrease post operative surgical site infection
- Decreases rate of hernia recurrence

**Despite excellent results in abdominal wall reconstruction, use of BTA in abdominal wall reconstruction is still considered off label use

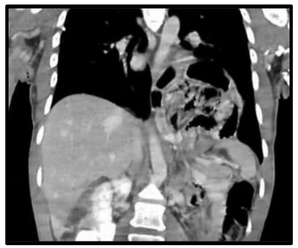


AIM: We hypothesized that chemical component separation with BTA could be used in paraesophageal hernia patients.

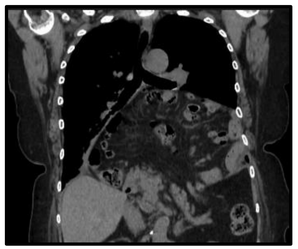
PATIENTS

In a series of three patients, two received botox injections for giant type IV paraesophageal hernias with loss of domain and one patient received botox for a history of cerebral palsy complicated by a hypertonic and spastic abdominal wall

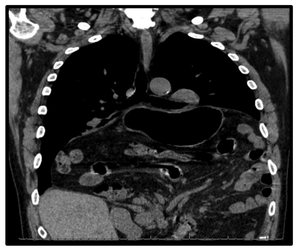
Goals: Improved intraabdominal visualization, increased abdominal wall compliance, decreased abdominal compartment pressures.



Patient #1
36 yo male with cerebral palsy complicated by spastic/hypertonic abdominal wall musculature and large paraesophageal hernia



Patient #2
77 yo female with giant type IV paraesophageal hernia complicated by loss of domain



Patient #3
70 yo male with giant type IV paraesophageal hernia complicated by loss of domain

METHODS

- The patients were selected in foregut clinic as those who may benefit from preoperative botox injections.
- They received chemical component separation 4 weeks prior to their surgery date with CT guided injections into their bilateral internal and external oblique muscles.
- On average, these patients receive 200U of botox split evenly in to six injections, three on each side at different points along the abdominal wall. The injections were very well tolerated.
- On the day of surgery, all patients received our standard approach to a paraesophageal hernia repair.
- They were able to be completed laparoscopically and all of them received anterior and posterior cruroplasty due to the large nature of the hiatal defects and gastropexy due to chronically shortened esophagus.
- On post-operative day one they received a barium esophagram to confirm no early recurrence of the hernia and were seen in clinic post operatively.

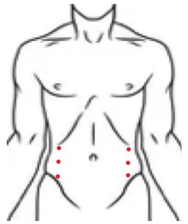


Figure 1. Red marks indicated typical location of 6 injections, 3 on each side spaced between the costal margin and iliac crest in the anterior/mid axillary line.



Figure 2. CT representation of right sided BTA injection into the oblique muscles



Figure 3. CT representation of right sided BTA injection into the oblique muscles

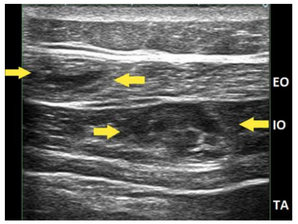


Figure 4. Longitudinal US image of the intramuscular placement of BTX/saline mixture. Intramuscular injection is shown as the hypoechoic area between the arrows. EO, external oblique; IO, internal oblique; TA, transversus abdominus muscle layers

CONCLUSION

Here we present two potential indications to consider off-label chemical component separation with BTA for paraesophageal hernias: loss of domain and abdominal hypertension. In all patients, we demonstrate that laparoscopic repair in these otherwise difficult cases is feasible and postulate that the use of preoperative botox could decrease risk of recurrence in the immediate post-operative period given the prolonged reduction in abdominal compartment pressures; this will require further study with larger cohorts and longitudinal follow up in the future.

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