Botulinum Toxin: adjunct or alternative to component separation

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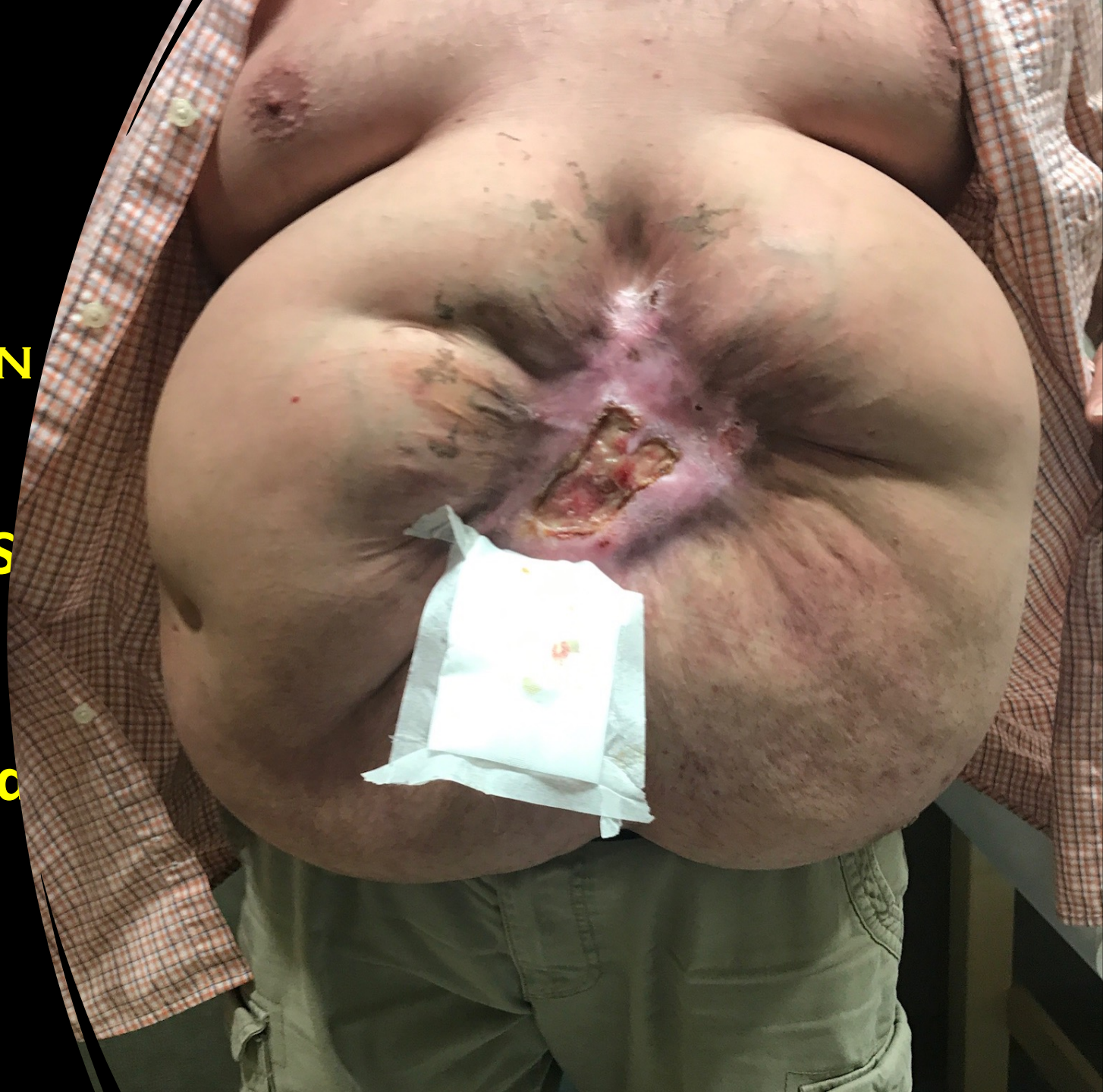
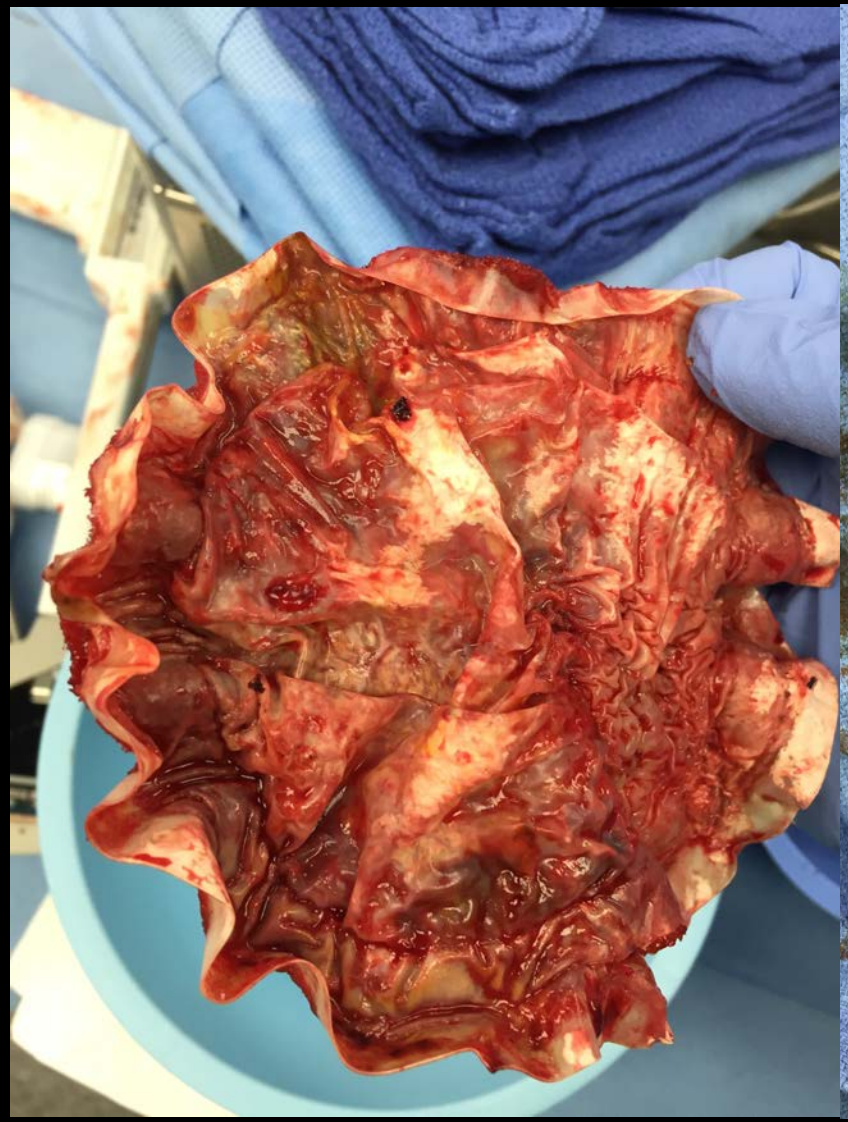
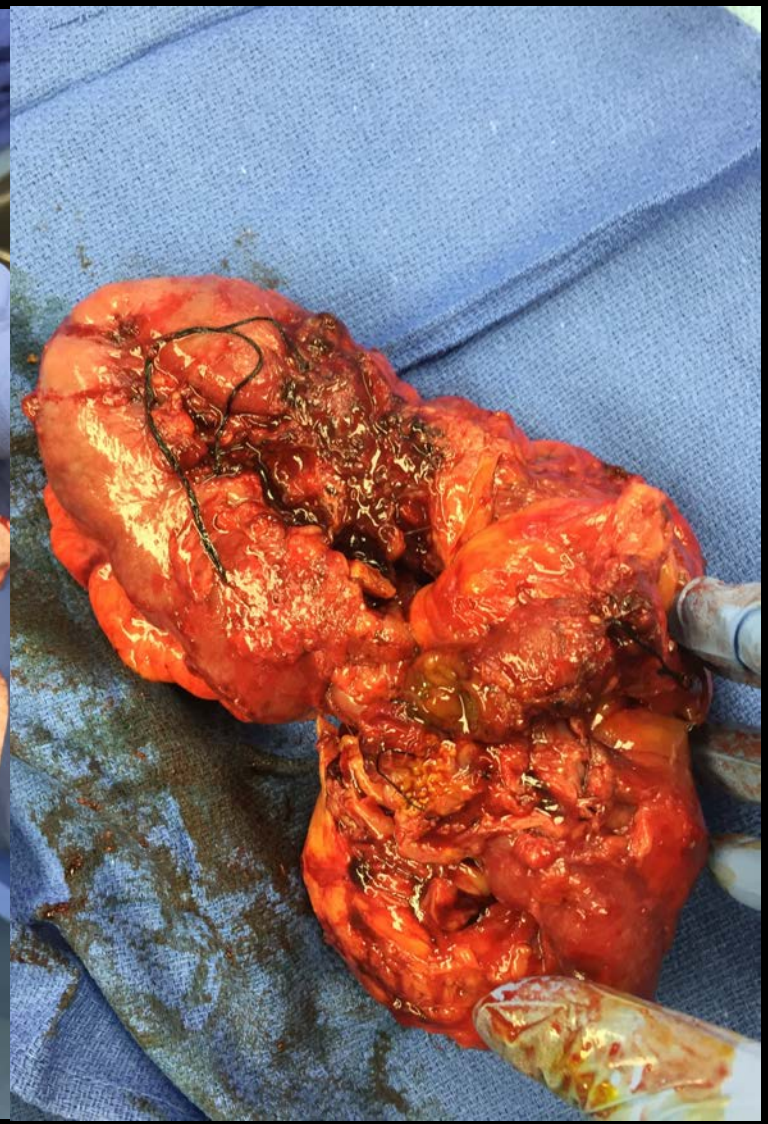


Disclosures

- Allergan Aesthetics, an AbbVie Company
- Acelity
- Bard
- Intuitive
- Medtronic
- Vicarious Surgical

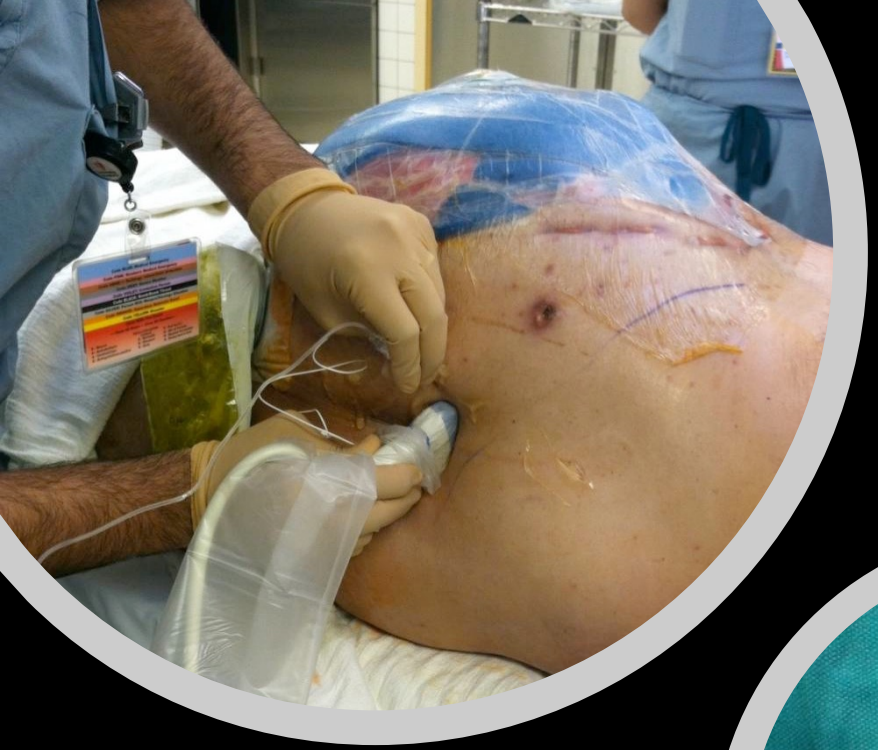


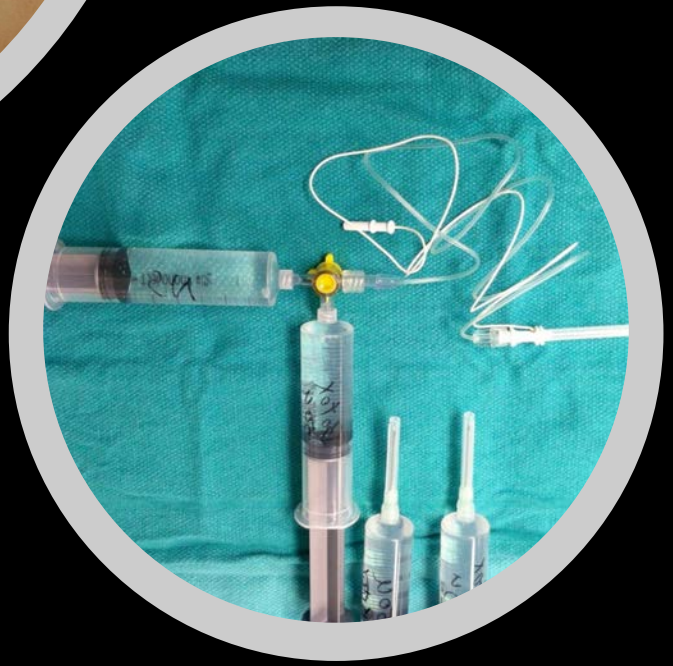


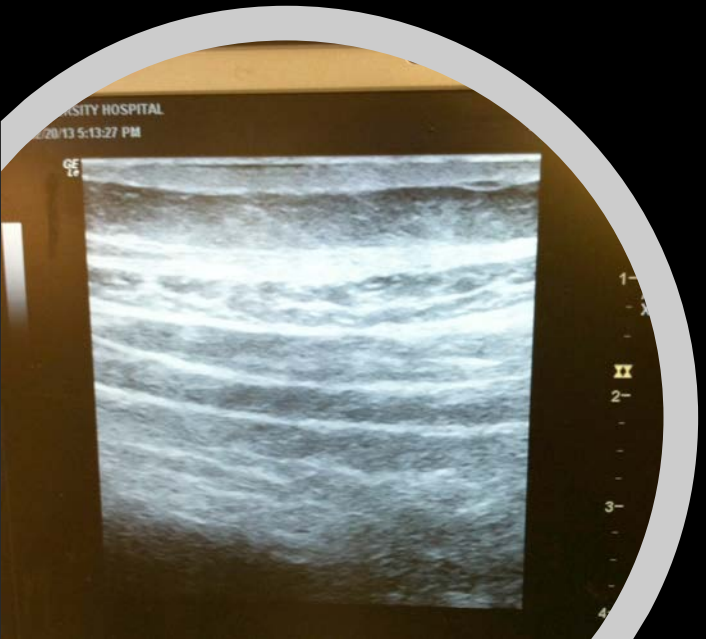
Botulinum toxin A

- Neurotoxin produced by Clostridium botulinum
- First used in humans in 1970s
- Blocks acetylcholine receptor at NMJ
- Onset 4-7 days, paralysis lasts 3-4 months
- Uses: glabellar rhytides, strabismus, focal dystonias, achalasia, migraines

Benefits in AWR



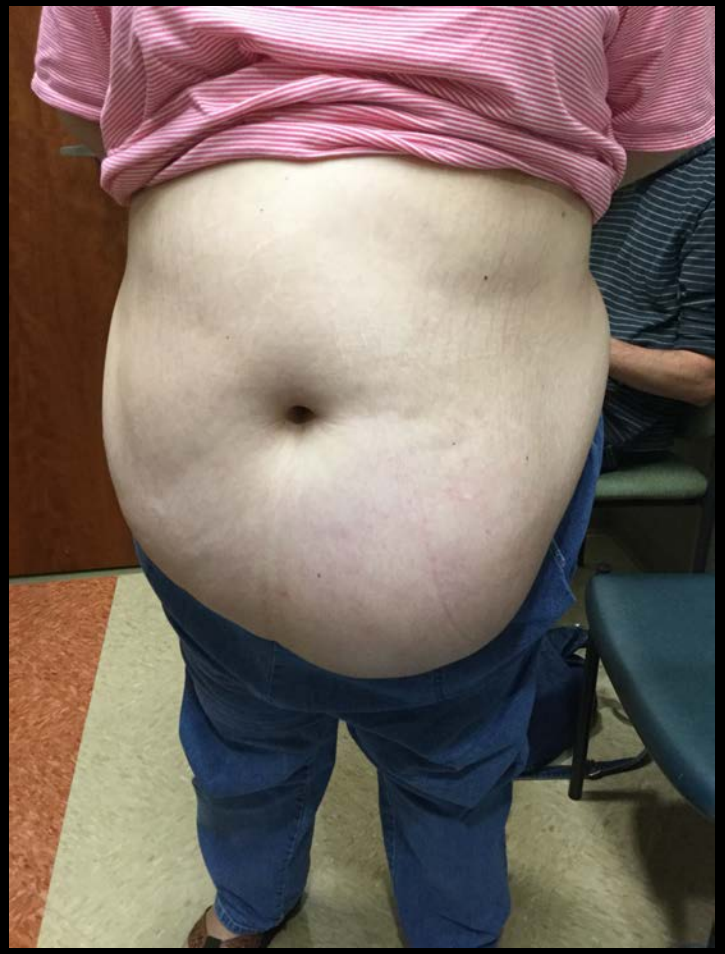




- Helps with closure of very large hernia defects
- Possible to use if CS is not possible or was already done
- Decreased need to raise skin flaps
- Tension free repair
- Outpatient procedure with proven safety profile
- Decrease in pain

When to Consider Chemodenervation:

- Loss of domain
- Previous component separation
- When anterior component separation is risky
- Unable to lose weight
- To augment pre-op pneumoperitoneum
- Post-op suture site pain
- To avoid a component separation



Closure of Defect

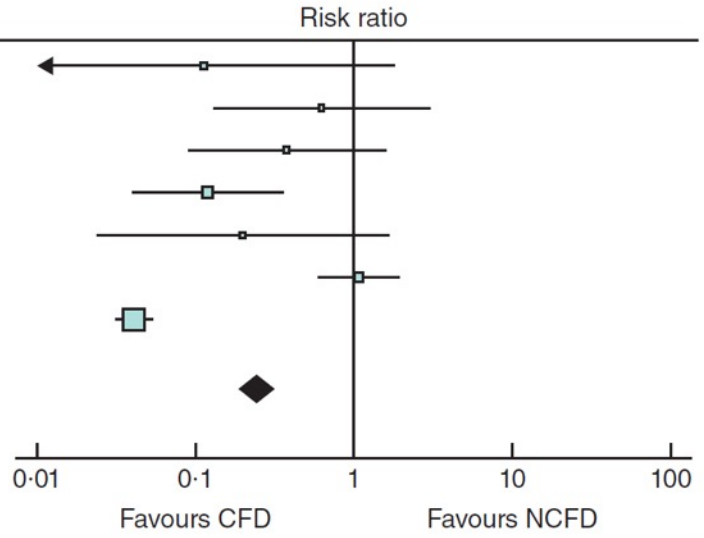
Meta-analysis of closure of the fascial defect during laparoscopic incisional and ventral hernia repair

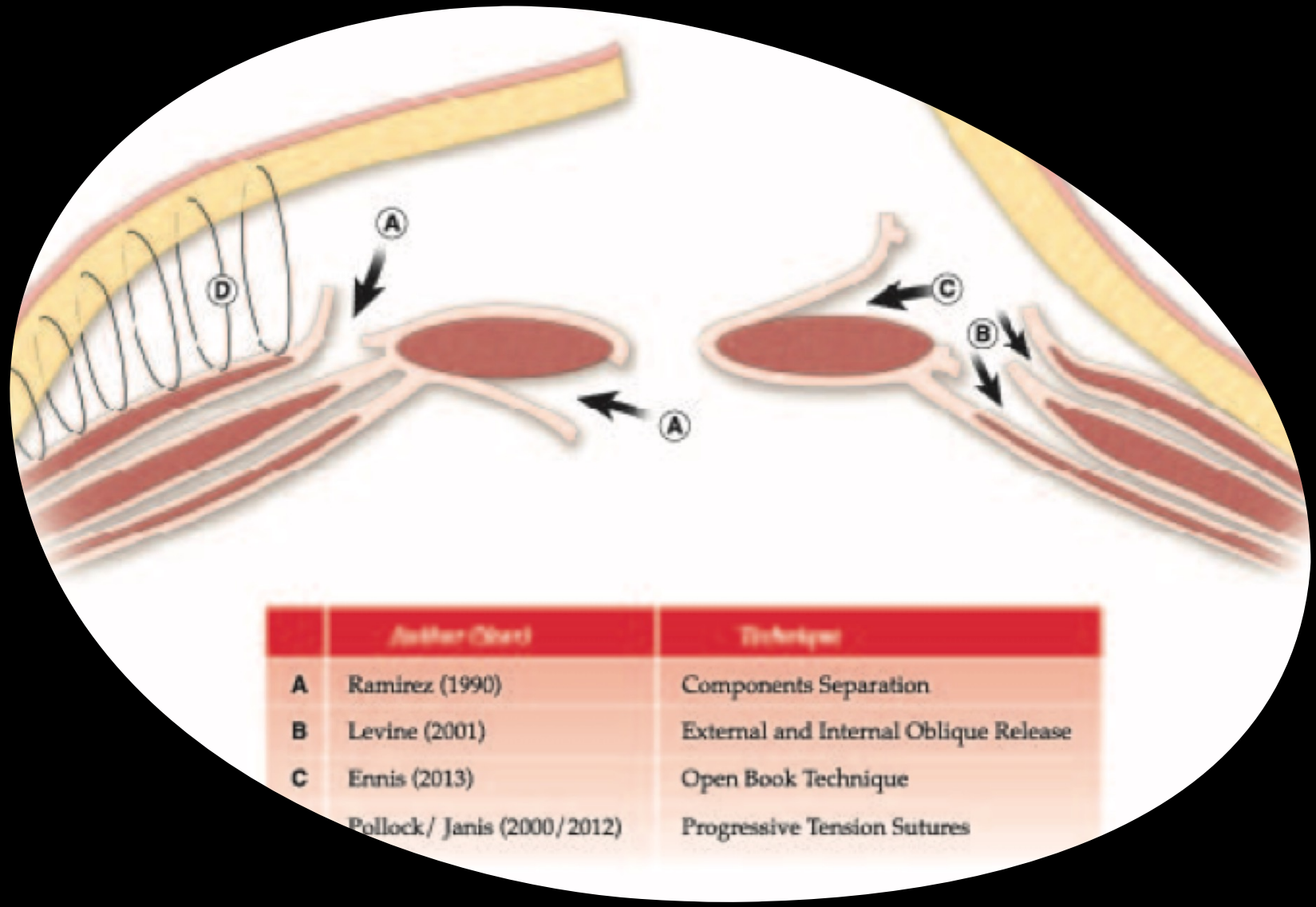
A. Tandon[1], S. Pathak[3], N. J. R. Lyons[3], Q. M. Nunes[1,2], I. R. Daniels[3] and N. J. Smart[3]

Reference	Adverse hernia-site outcomes CFD	NCFD	Weight (%)	Risk ratio
Sharma *et al.*[26]	0 of 17	14 of 58	5·2	0·11 (0·01, 1·80)
Banerjee *et al.*[29]	2 of 67	6 of 126	3·2	0·63 (0·13, 3·02)
Zeichen *et al.*[17]	2 of 35	14 of 93	5·9	0·38 (0·09, 1·59)
Clapp *et al.*[22]	3 of 36	25 of 36	19·3	0·12 (0·04, 0·36)
Gonzalez *et al.*[28]	1 of 67	5 of 67	3·9	0·20 (0·02, 1·67)
Wennergren *et al.*[31]	19 of 97	18 of 99	13·7	1·08 (0·60, 1·93)
Chelala *et al.*[11]	52 of 1294	32 of 32	48·8	0·04 (0·03, 0·05)
Total	79 of 1613	114 of 511	100·0	0·25 (0·18, 0·33)

Heterogeneity: $\chi^2 = 199{\cdot}83$, 6 d.f., $P < 0{\cdot}001$; $I^2 = 97\%$

Test for overall effect: $Z = 9{\cdot}40$, $P < 0{\cdot}001$



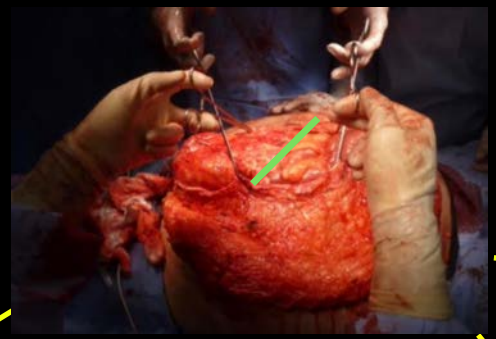


	Author (Year)	Technique
A	Ramirez (1990)	Components Separation
B	Levine (2001)	External and Internal Oblique Release
C	Ennis (2013)	Open Book Technique
	Pollock/ Janis (2000/2012)	Progressive Tension Sutures

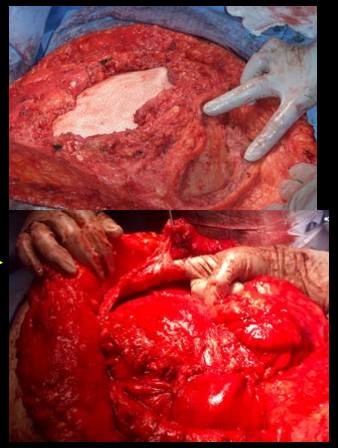
To separate the components or to not…

Remaining defect size*

BTA?

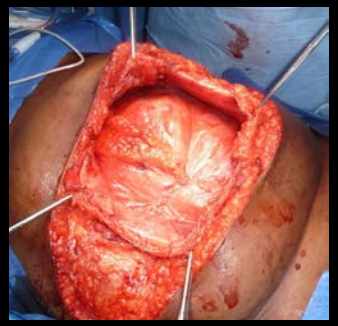


>10cm



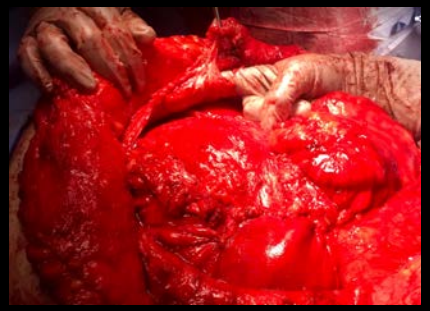
EOR+PSR

0



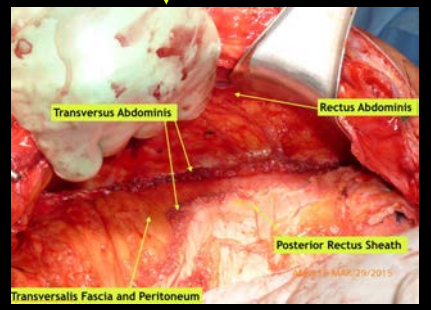
PPR

0-2cm



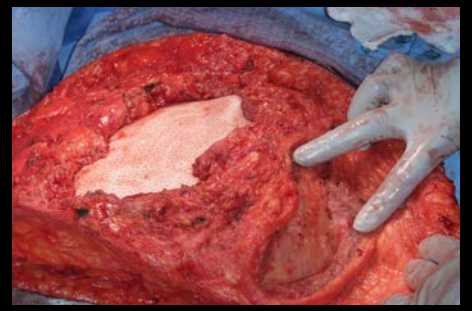
PSR

2-5cm



TAR

5-10cm



EOR

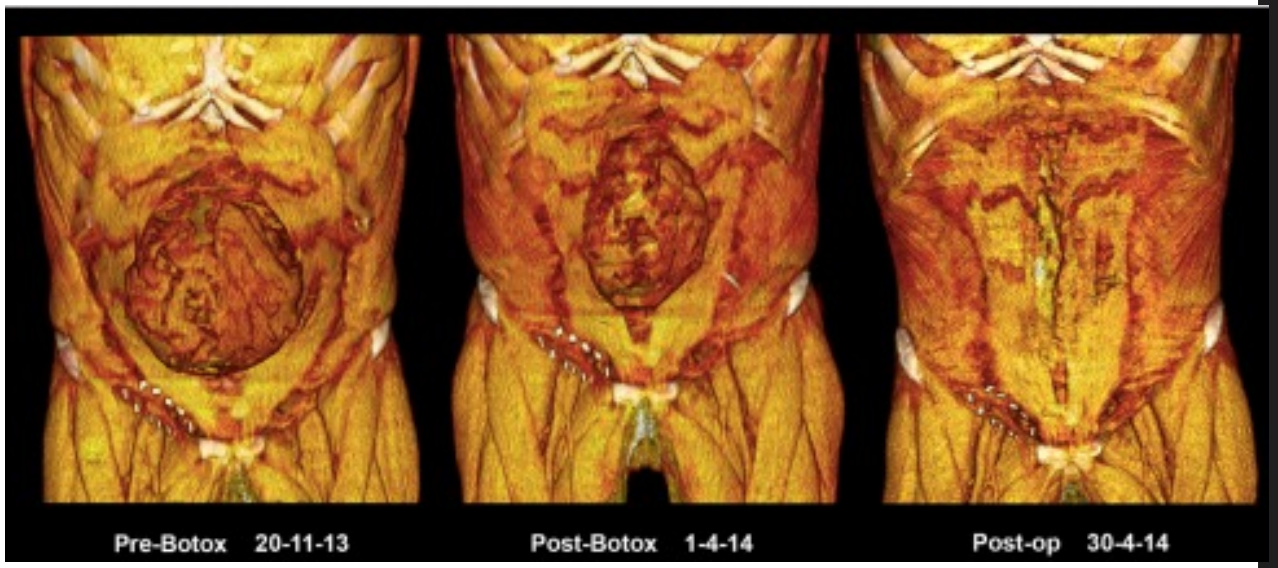
*actual results will vary

Hernia (2016) 20:209–219
DOI 10.1007/s10029-016-1478-6

ORIGINAL ARTICLE

Laparoscopic repair of complex ventral hernia facilitated by pre-operative chemical component relaxation using *Botulinum Toxin A*

K. E. Elstner[1,6] · A. S. W. Jacombs[2] · J. W. Read[3,8] · O. Rodriguez[6] · M. Edye[1,5] · P. H. Cosman[1,6] · A. N. Dardano[4] · A. Zea[6] · T. Boesel[1] · D. J. Mikami[7] · C. Craft[1] · N. Ibrahim[1,2,6]



- Increase in lateral muscle length:
  - 15.7cm →19.9cm per side; $p<0.001$
  - Mean gain of 4.2cm for each side (or 9.4cm total)
- Reduction in defect size of up to 58% noted
- No recurrences with mean follow-up 16 months

Outcomes of Chemical Component Paralysis Using Botulinum Toxin for Incisional Hernia Repairs

Benjamin Zendejas · Mohammad A. Khasawneh · Boris Srvantstyan · Donald H. Jenkins · Henry J. Schiller · Martin D. Zielinski

World J Surg (2013) 37:2830–2837
DOI 10.1007/s00268-013-2211-6

- Evaluated pain
- 22 pts w Botox vs 66 controls
- Ultrasound guided - 300 units Botox

Outcomes of Chemical Component Paralysis Using Botulinum Toxin for Incisional Hernia Repairs

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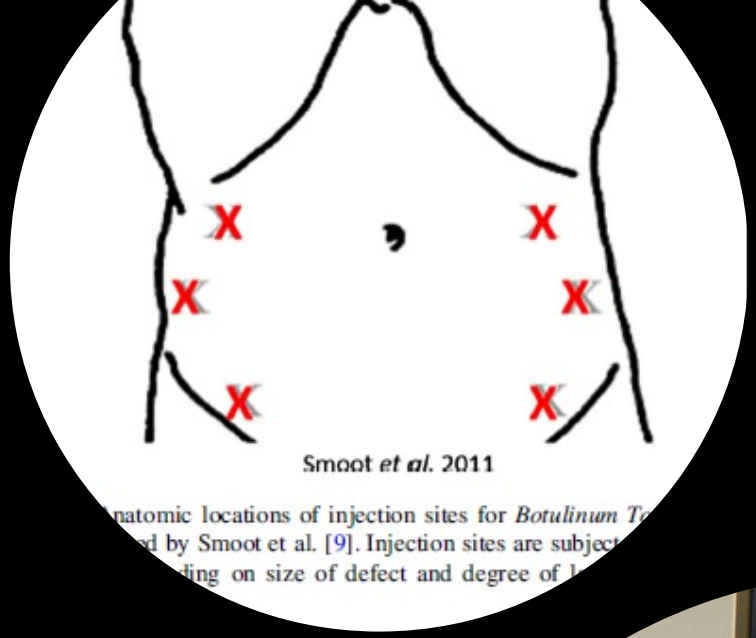
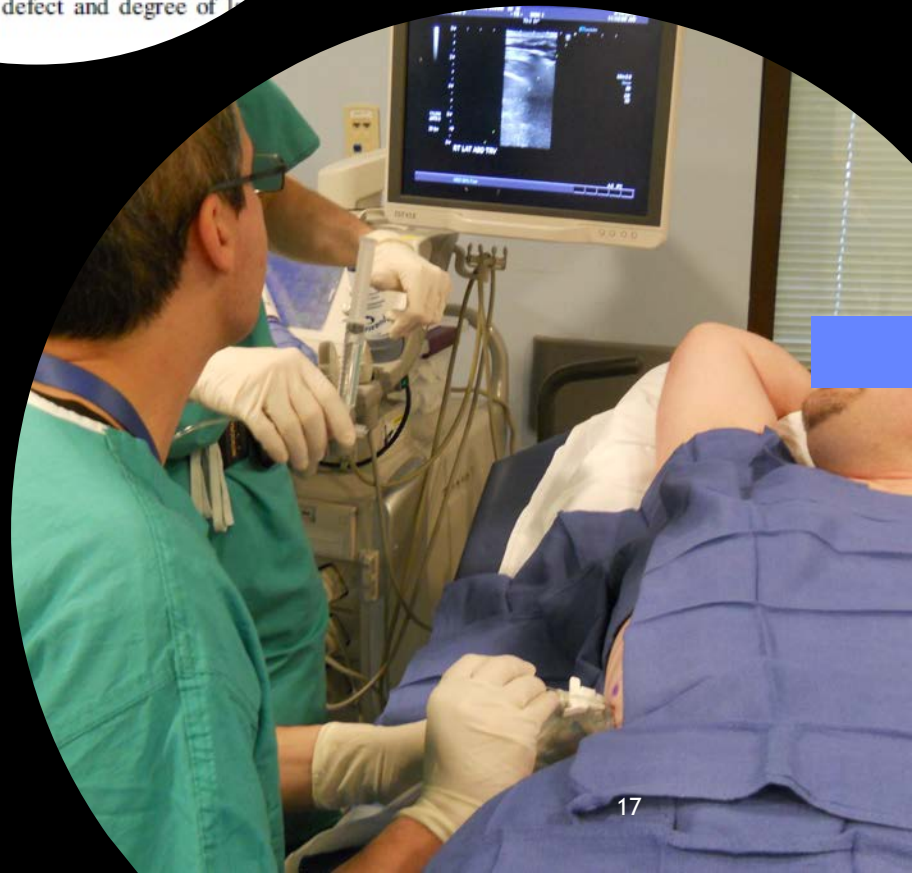
World J Surg (2013) 37:2830–2837
DOI 10.1007/s00268-013-2211-6

- Botox patients: less morphine at day 2 and day 5
- Botox: reduced pain at day 2 and day 5
- LOS and recurrence similar (f/u 18 mo)
  - LOS: 4±3 vs 3±2 days; p=0.15
  - Recurrence: 9.1% in both groups

Chemodenervation



- 1 month preoperatively
- 200-300 IU BTA in 100-150 mL Saline
- 22-25 gauge spinal needle
- CT or US guided
- Inject each layer of the oblique at 6 sites



Preoperative botulinum toxin A injection in complex abdominal wall reconstruction- a propensity-scored matched study

Eva Barbara Deerenberg [1], Jenny Meng Shao [2], Sharbel Adib Elhage [3], Robert Lopez [4], Sullivan Armando Ayuso [5], Vedra Abdomerovic Augenstein [6], B Todd Heniford [7]

Introduction: Fascial closure during complex abdominal wall reconstruction (AWR) improves recurrence and wound infection rates. To facilitate fascial closure in massive ventral hernias preoperative Botulinum Toxin A (BTA) injection can be used.

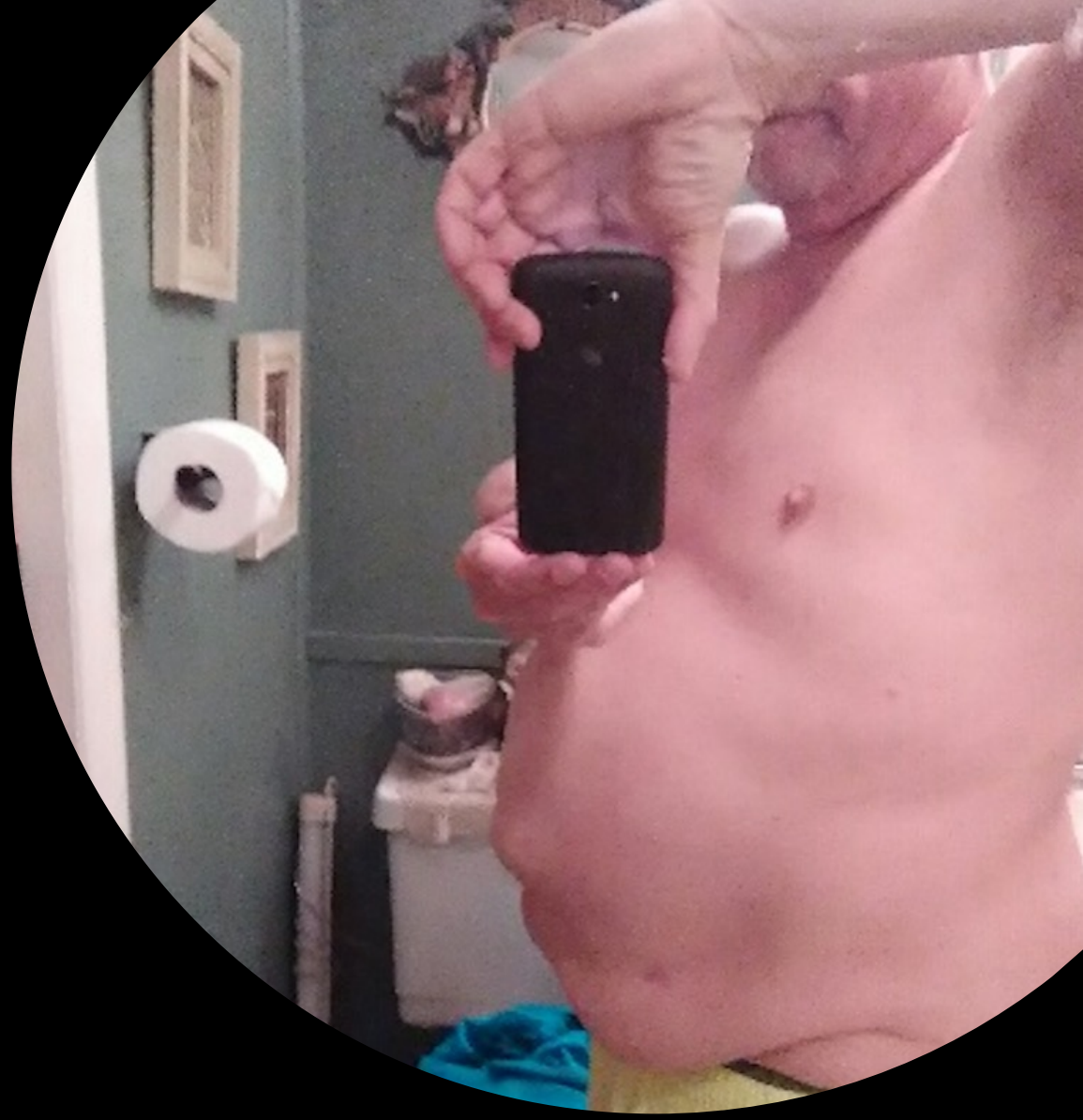
Methods: 2:1 propensity-scored matching of patients undergoing AWR with and without BTA was performed based on BMI, defect width, and loss of domain using CT-volumetric analysis.

Results: 145 patients without BTA and 75 with BTA were comparable on hernia size (240vs251cm^2, p = 0.589) and hernia volume (1405vs1672cm^3, p = 0.243). Patients with BTA had higher wound class (CDC≥3 37%vs13%, p < 0.001). Patients with BTA had a higher fascial closure rate (92%vs81%, p = 0.036), received more components separation (61%vs47%, p = 0.042), lower wound infection rate (12%vs26%,p = 0.019) and comparable recurrence rates (9%vs12%, p = 0.589). Recurrences occurred more often without complete fascial closure compared to patients with (33%vs7%, p < 0.001).

Conclusion: In patients with massive ventral hernias and severe loss of domain, preoperative BTA-injection improves fascial closure rates during AWR.

AmJSurg 2021

- 51 yo man
- BMI 35, Diabetes (HgbA1C 7.4)
- 9 OVHRs, last hernia repair was a Bilateral TAR



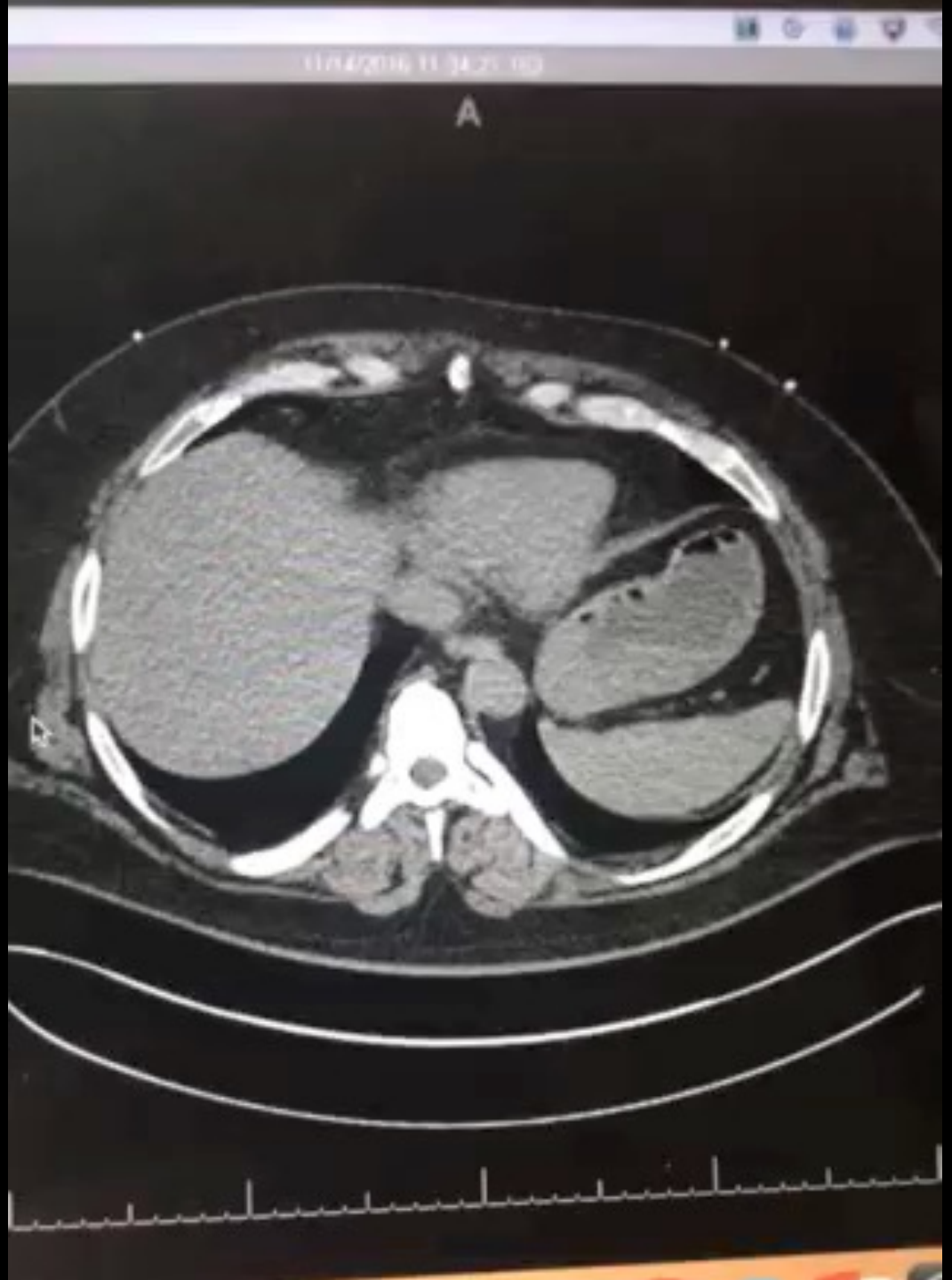
DATE OF PROCEDURE: 10/01/08

PREOPERATIVE DIAGNOSIS: Complex ventral hernia.

POSTOPERATIVE DIAGNOSIS: Complex ventral hernia plus intestinal fistula.

PROCEDURE:
1. Laparotomy with takedown of intestinal fistula.
2. Resection of small bowel including previous anastomotic site.
3. Repair of ventral hernia with bilateral rectus myofascial advancement flaps
4. sub muscular Placement of xenograft with a size of 2400 cm2 of bovine collagen.

to the small bowel to this fistulous tract to the anterior abdominal wall approximately 8 cm of small bowel was resected along with the previous anastomosis and this standard handsewn reconstruction completed using a side-to-side configuration. Mesentery was taken down over 2-0 ties and external sutures layer of 4-0 silk used and then internal suture layer of 3-0 PDS. Mesenteric defect was closed with 4-0 silk. The abdominal field then irrigated with this antibiotic impregnated saline solution. All sponge and needle counts were correct and so then flaps were made underneath the rectus muscles. There were considerable amount of right-sided lateralization of the right rectus sheath. The posterior rectus sheath could be mobilized circumferentially around the entire abdominal field and then the lateral muscles opened into by dividing the lateral aspect of the rectus sheath on both sides constituting a lateral relaxation of the rectus sheath. This plane was then developed, well laterally into the plane in-between the internal oblique and transversalis muscles of the lateral abdominal wall and this was carried down into the preperitoneal space inferiorly. The actual hernia defect ended just below the umbilicus and the incision was not extended below the umbilicus but the preperitoneal space entered once this wide preperitoneal space was mobilized, a closure of this layer was performed inferior and superior this could be done directly, but in the middle piece of 6 x 6 Vicryl mesh was necessary. This was sewn in place with a 0 PDS. Once this layer was closed to portion pieces of 20 x 30 cm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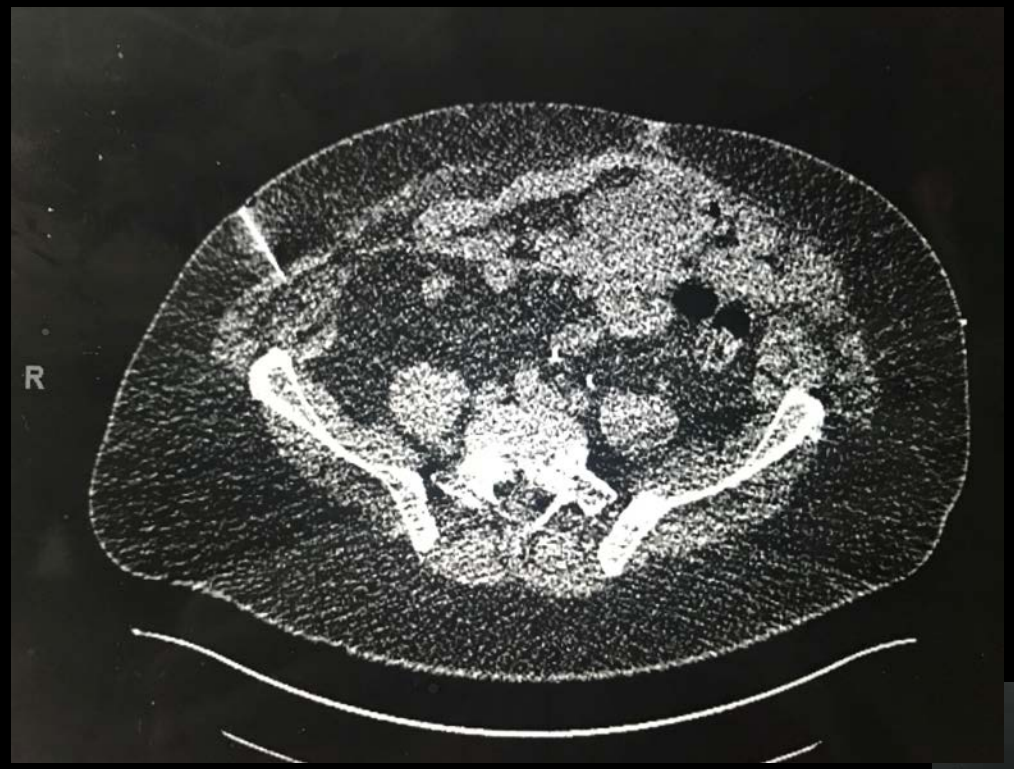
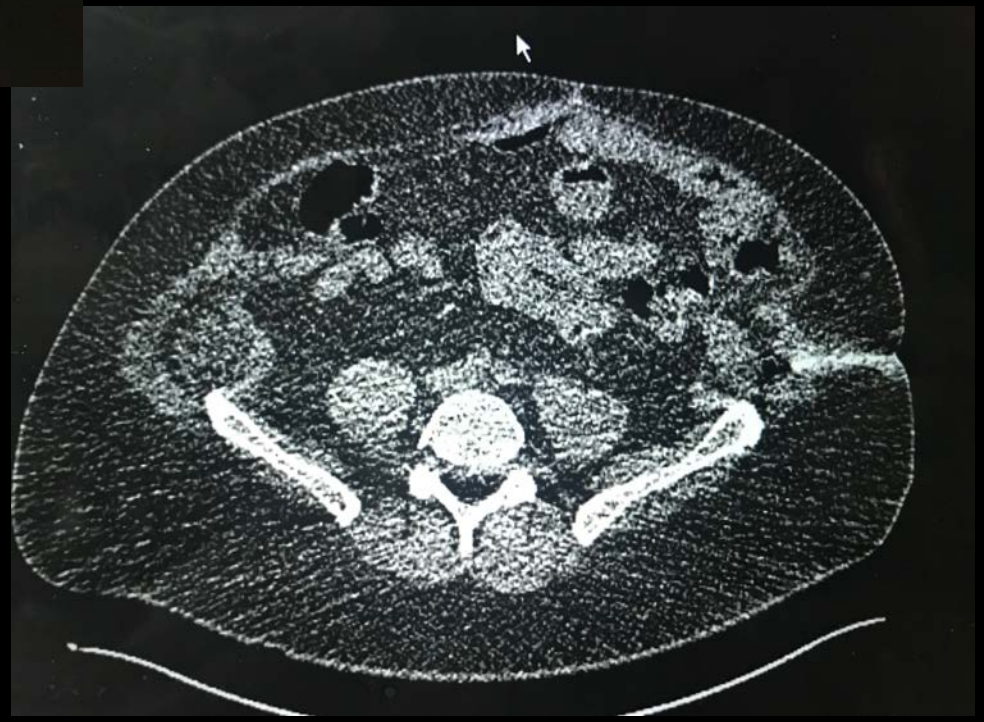
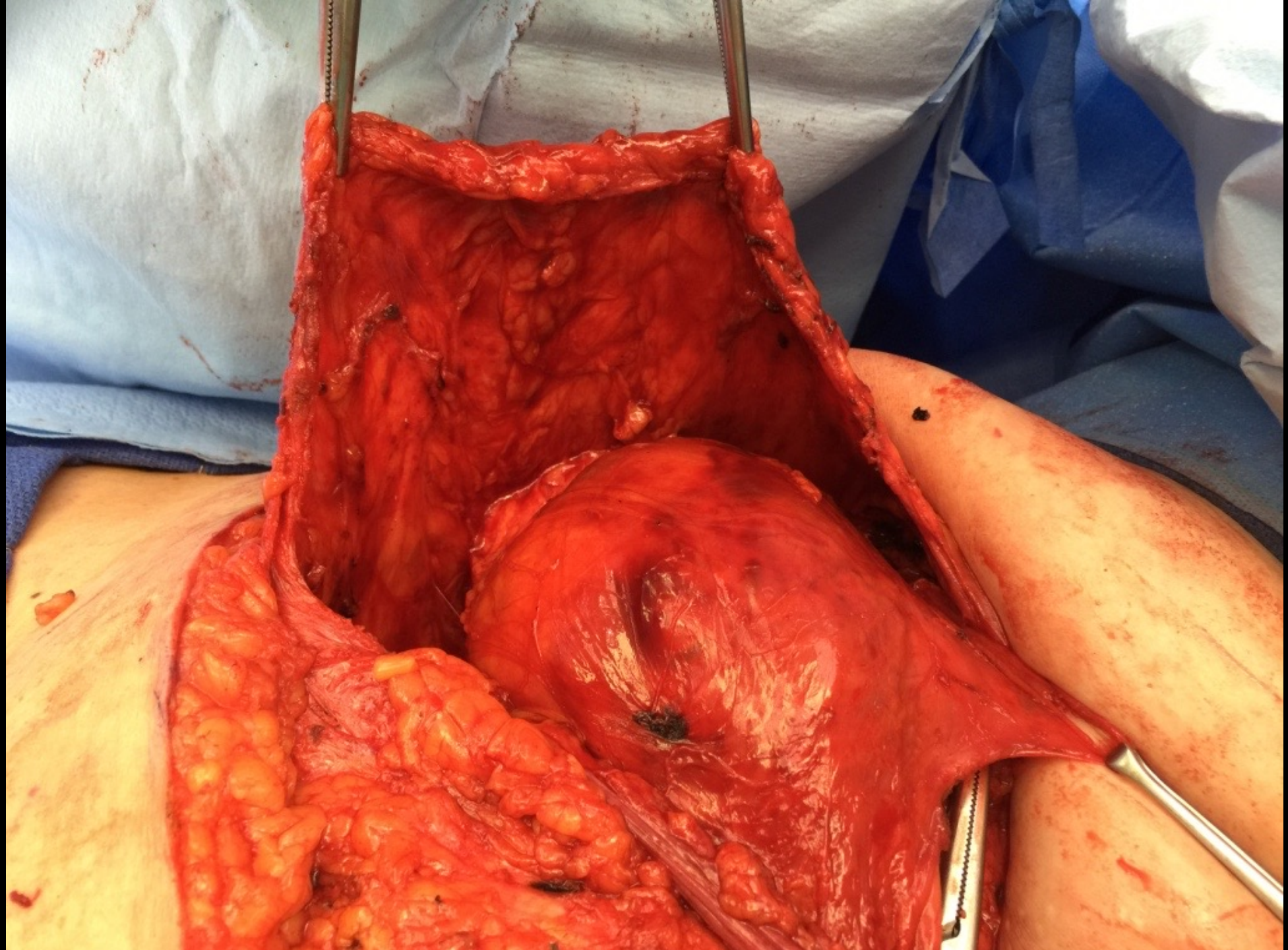


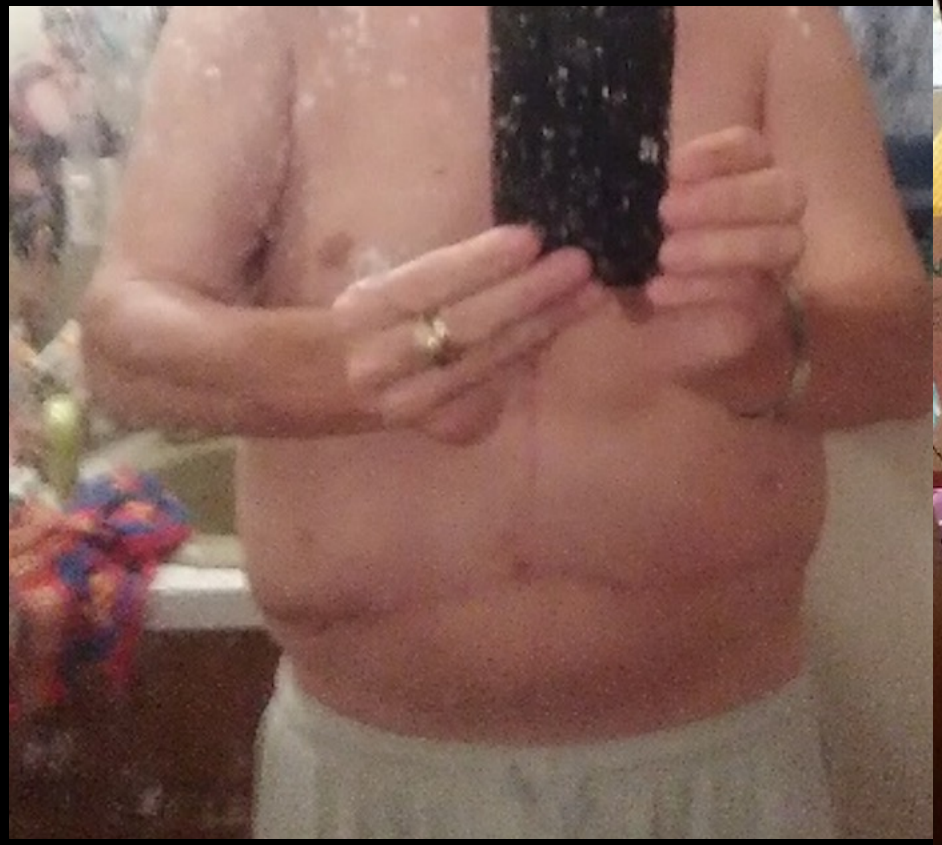
BTA Injections

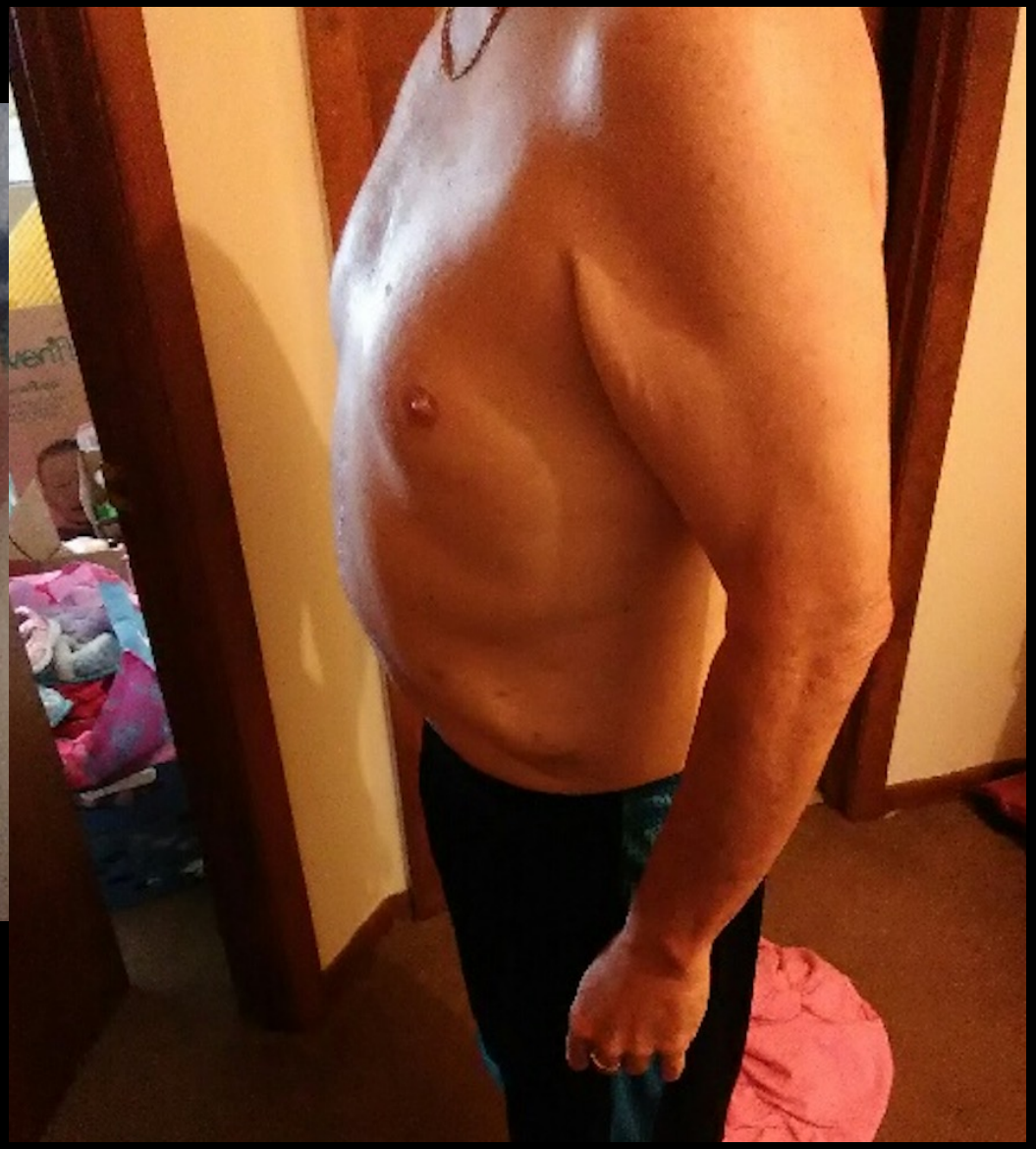


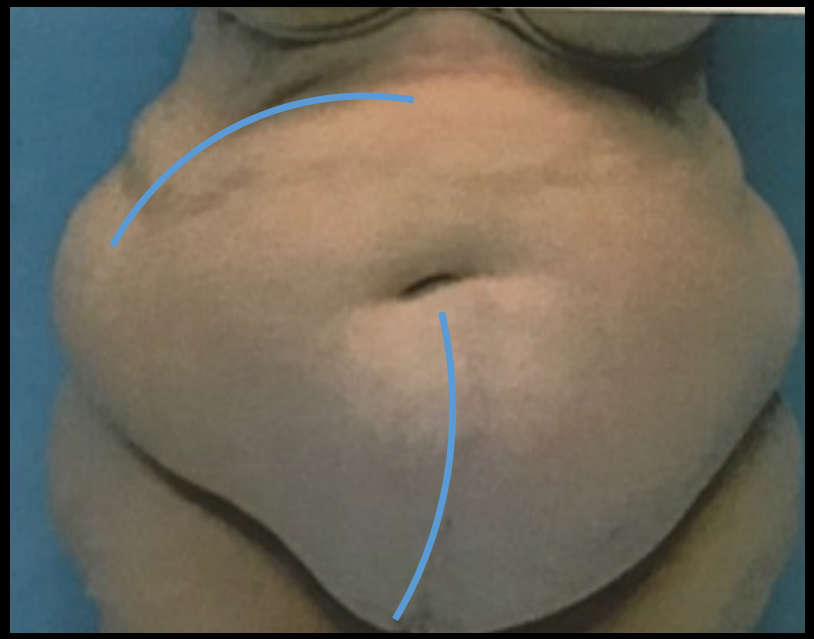
1 month later

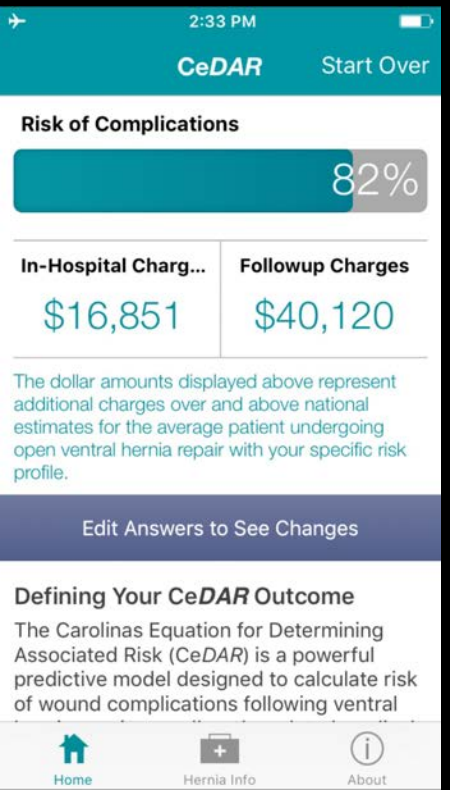
- **VHR with mesh**
- **Preperitoneal mesh placement (50x50 Prolene mesh)**
- **Fascial closure**



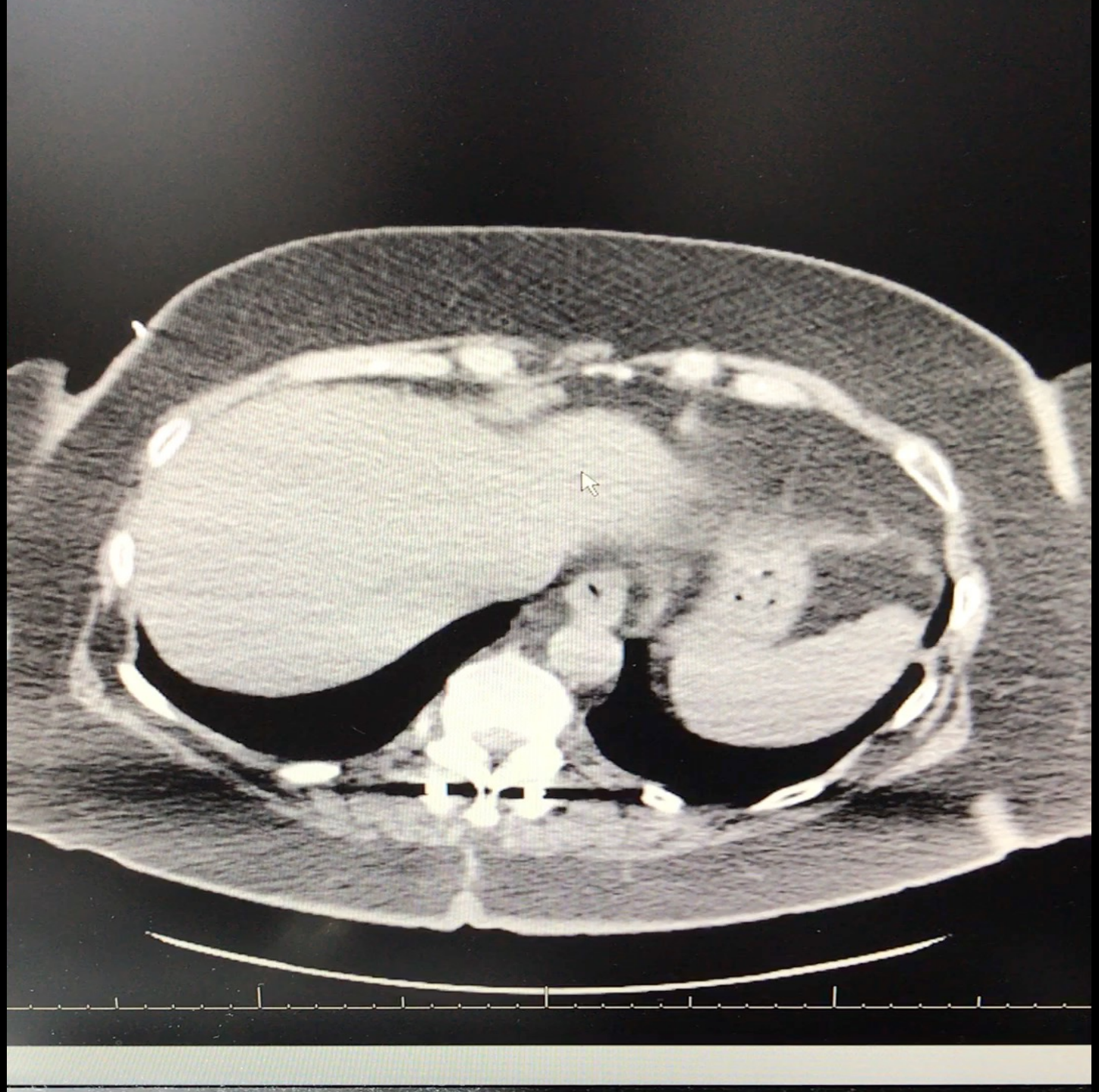


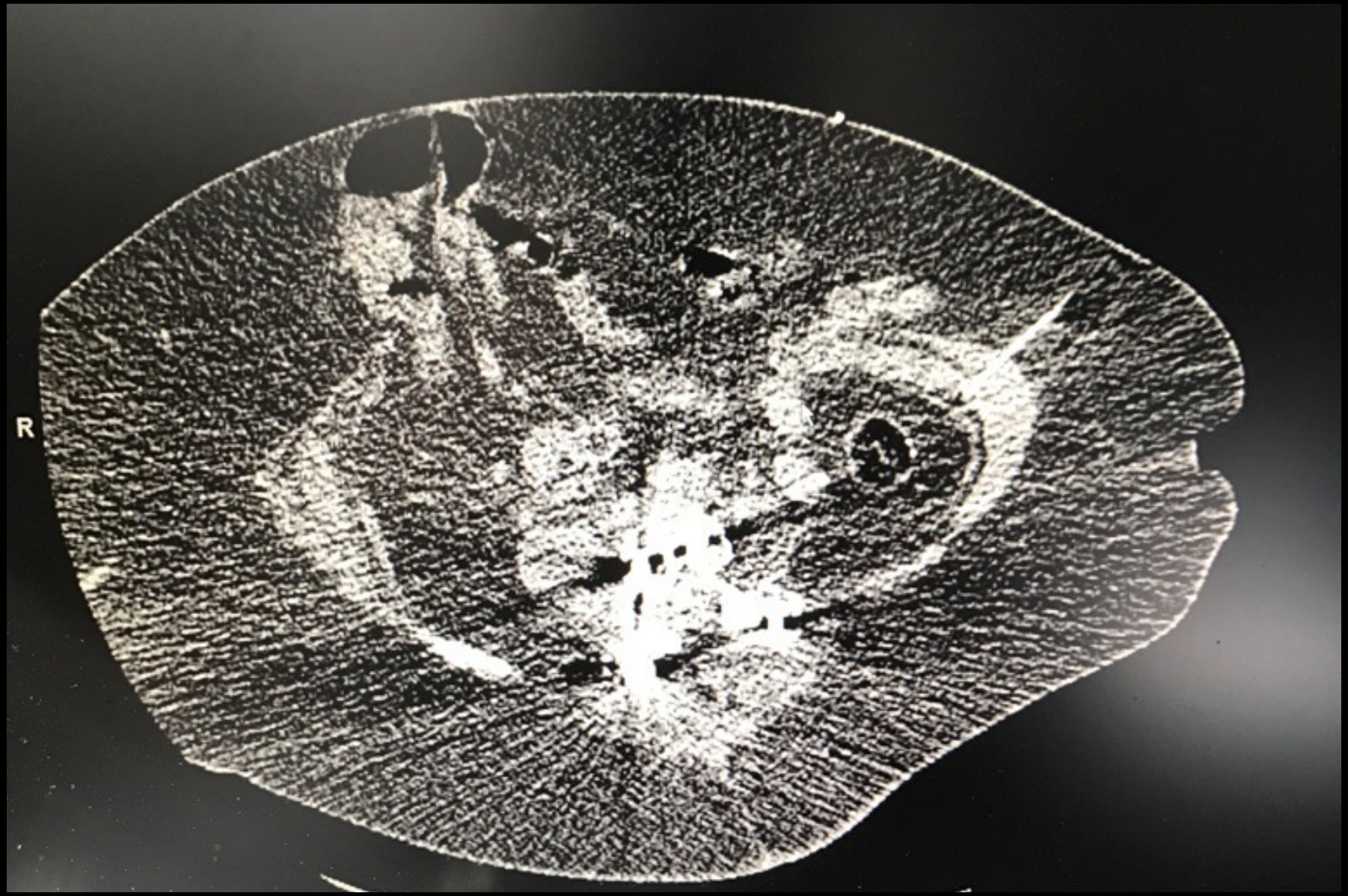






- 75 year old woman with a history of anterior spinal exposure referred for a hernia repair. Just diagnosed with endometrial CA.
- PMH: HTN, degenerative joint disease
- Wt: 288 lbs, BMI 45

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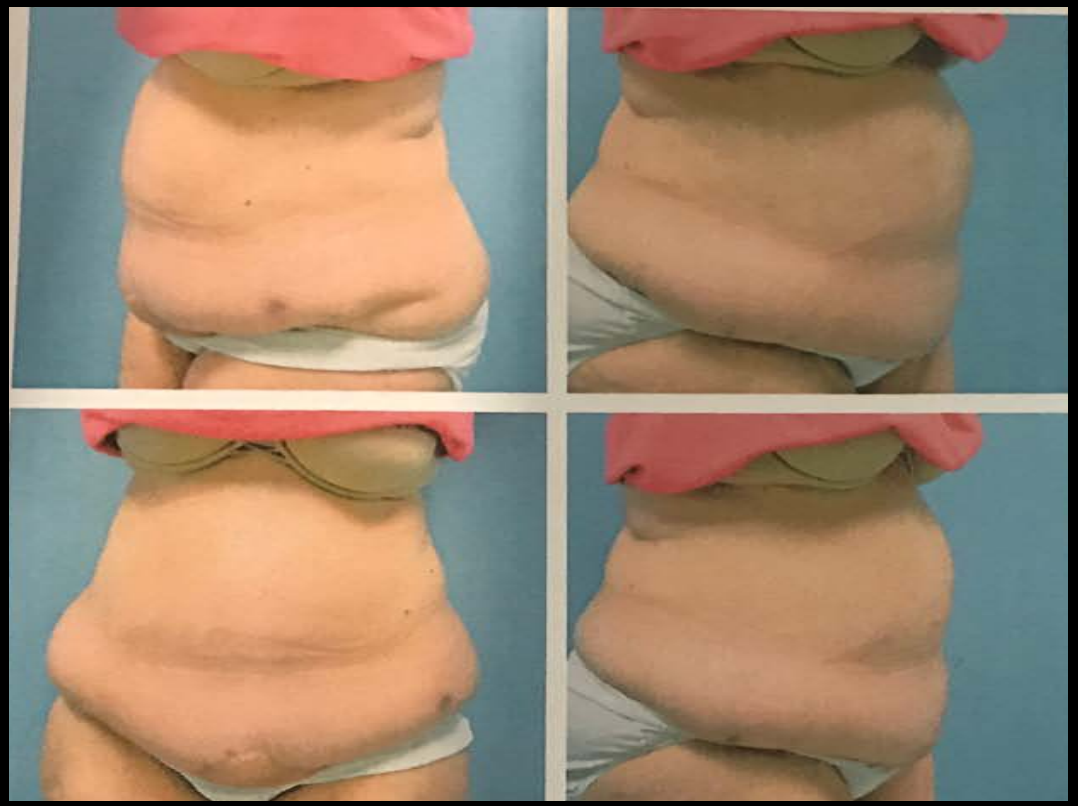
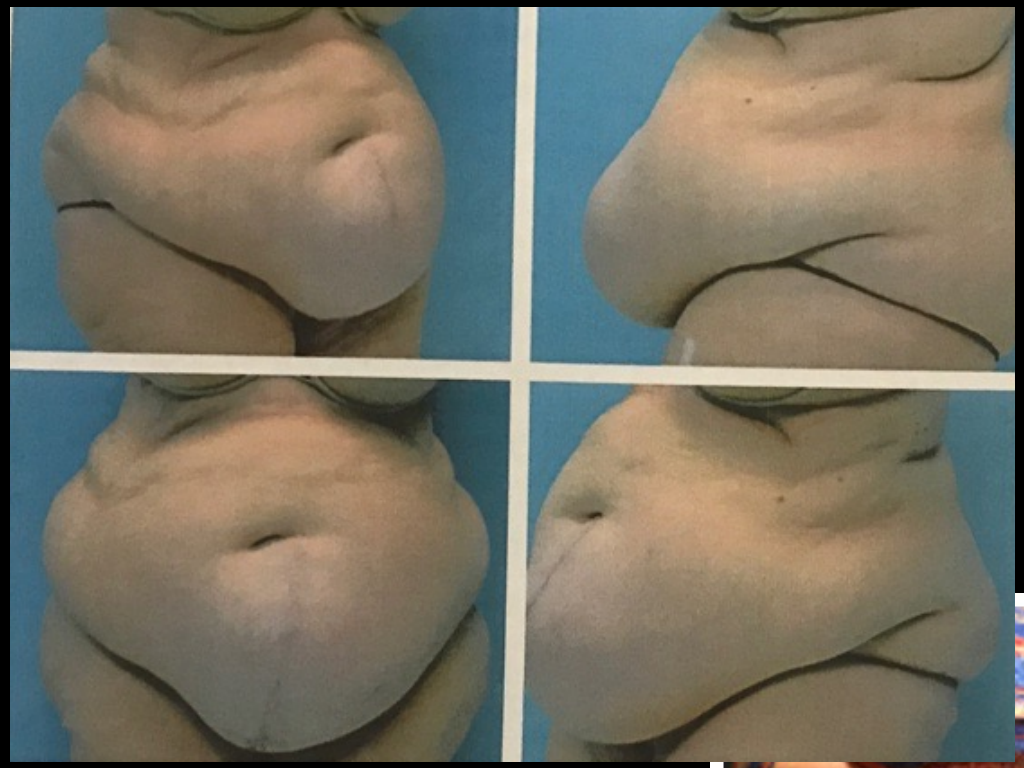


One month after Botox

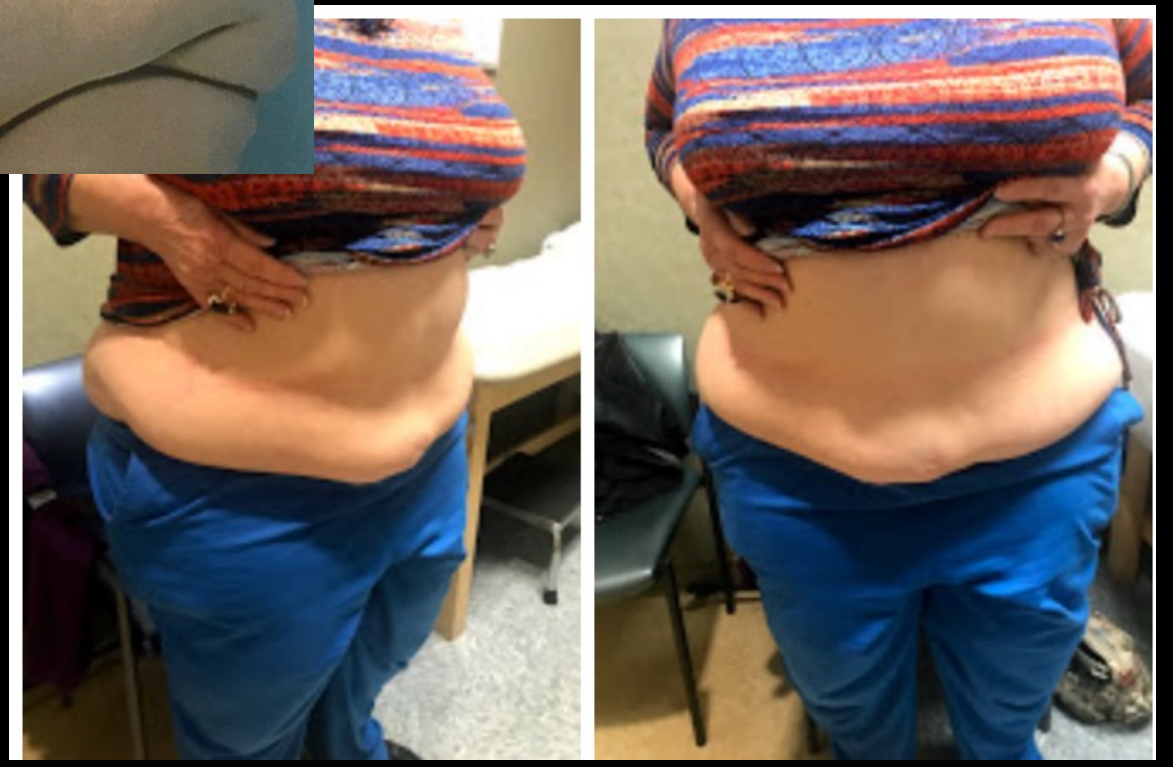
Panniculectomy

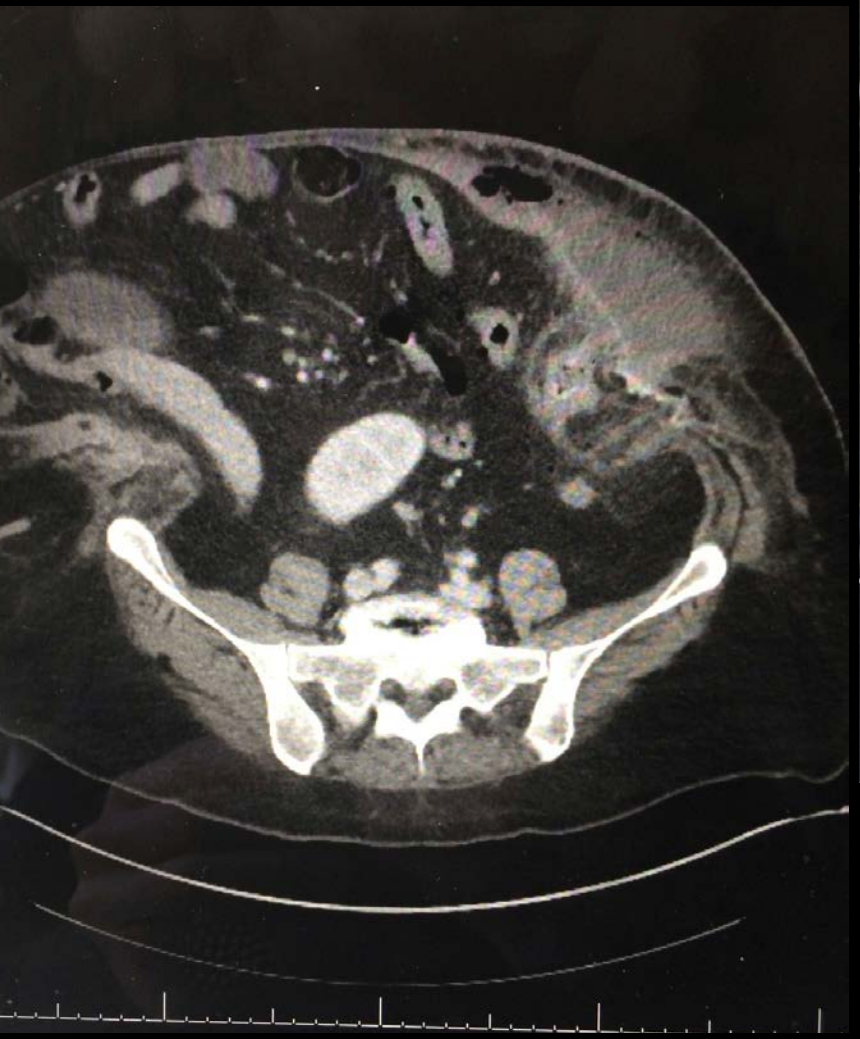
Total hysterectomy, BSO, pelvic lymph node sampling

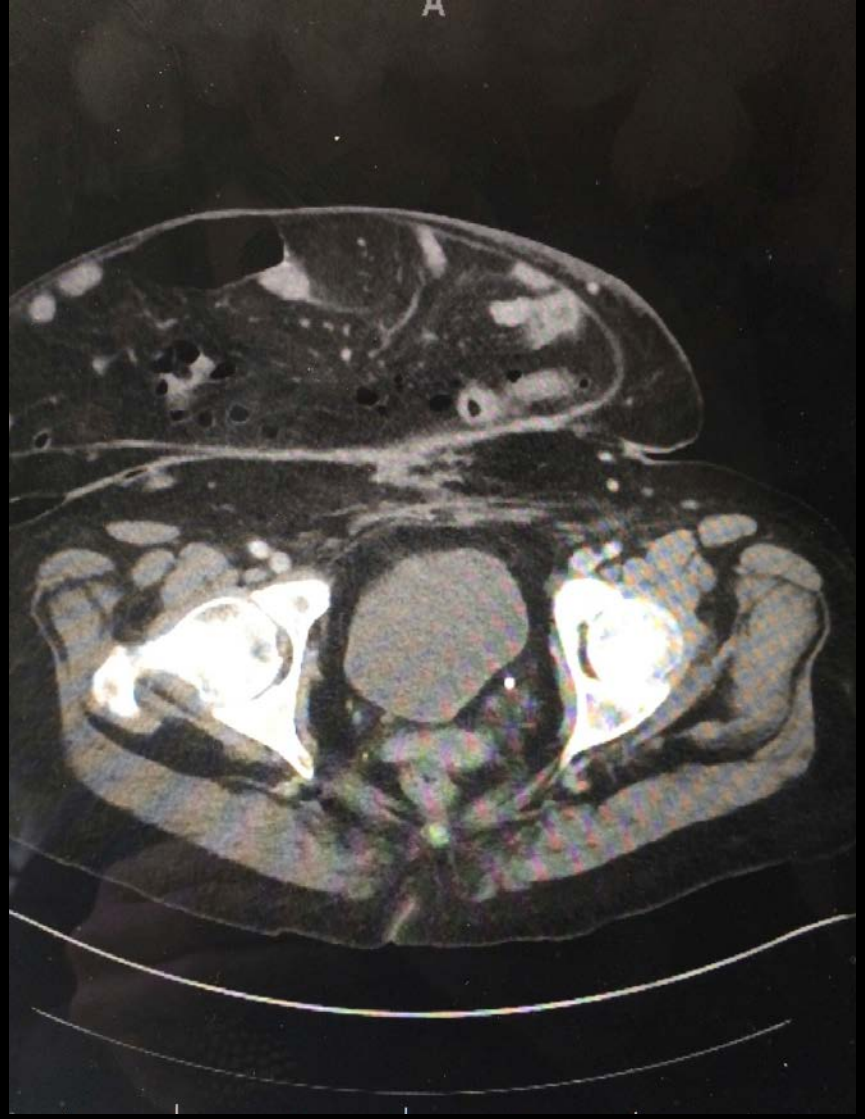
VHR w Mesh, bilateral EOR



2 yr fu



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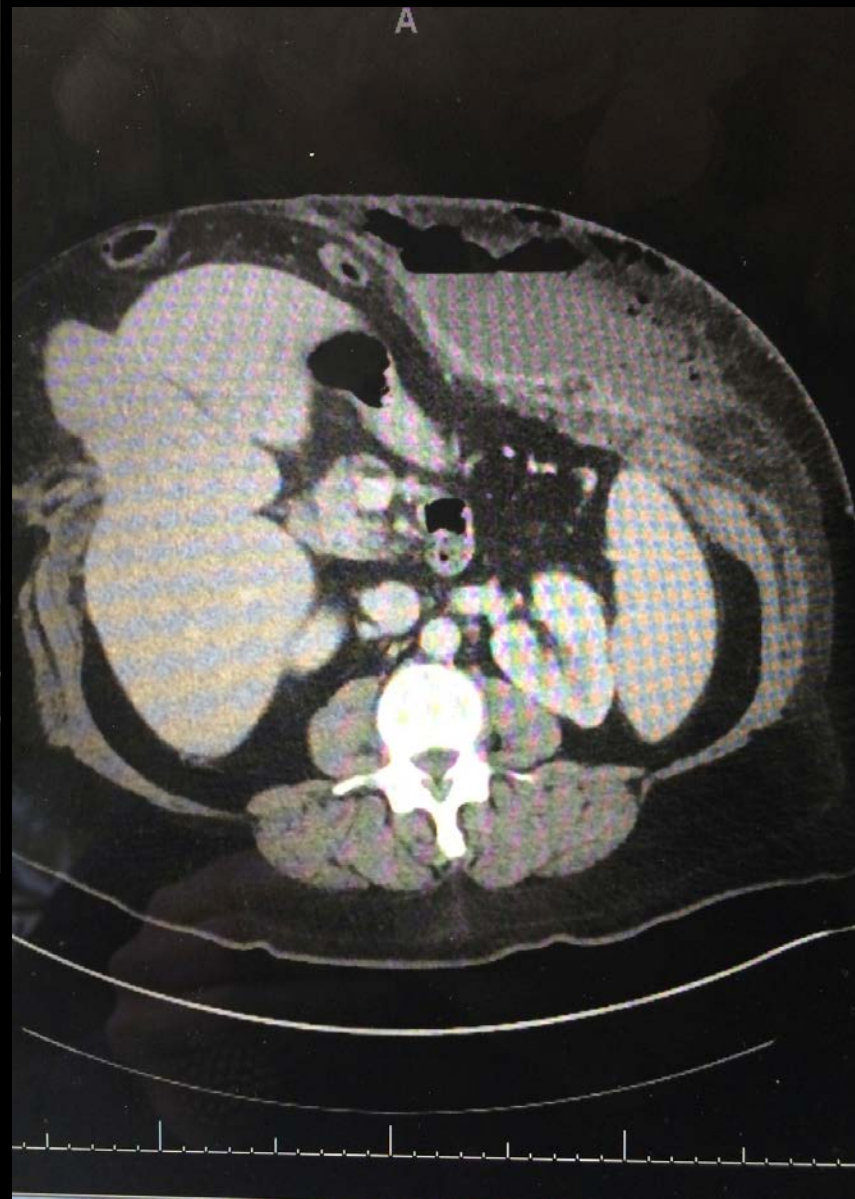
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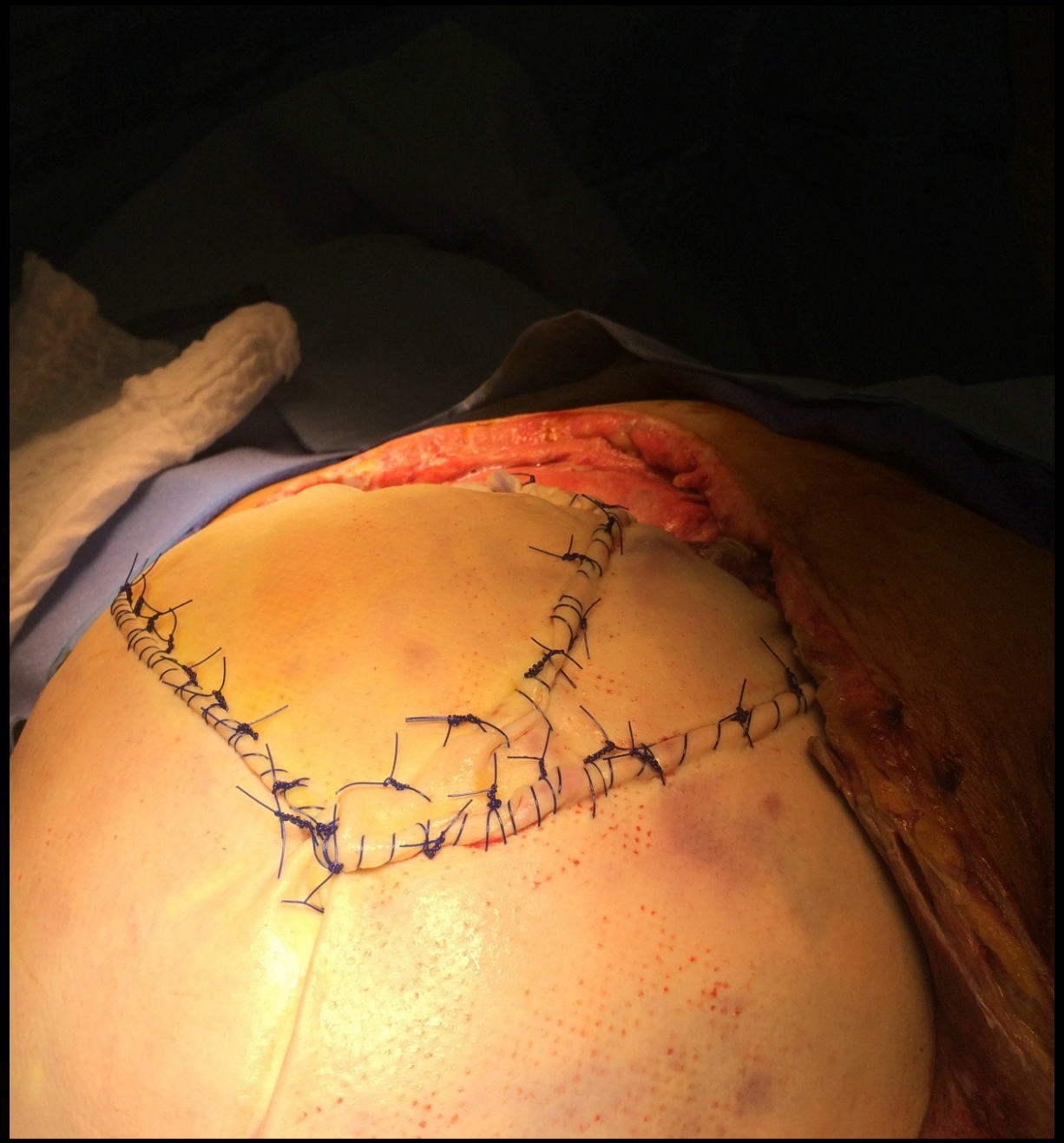

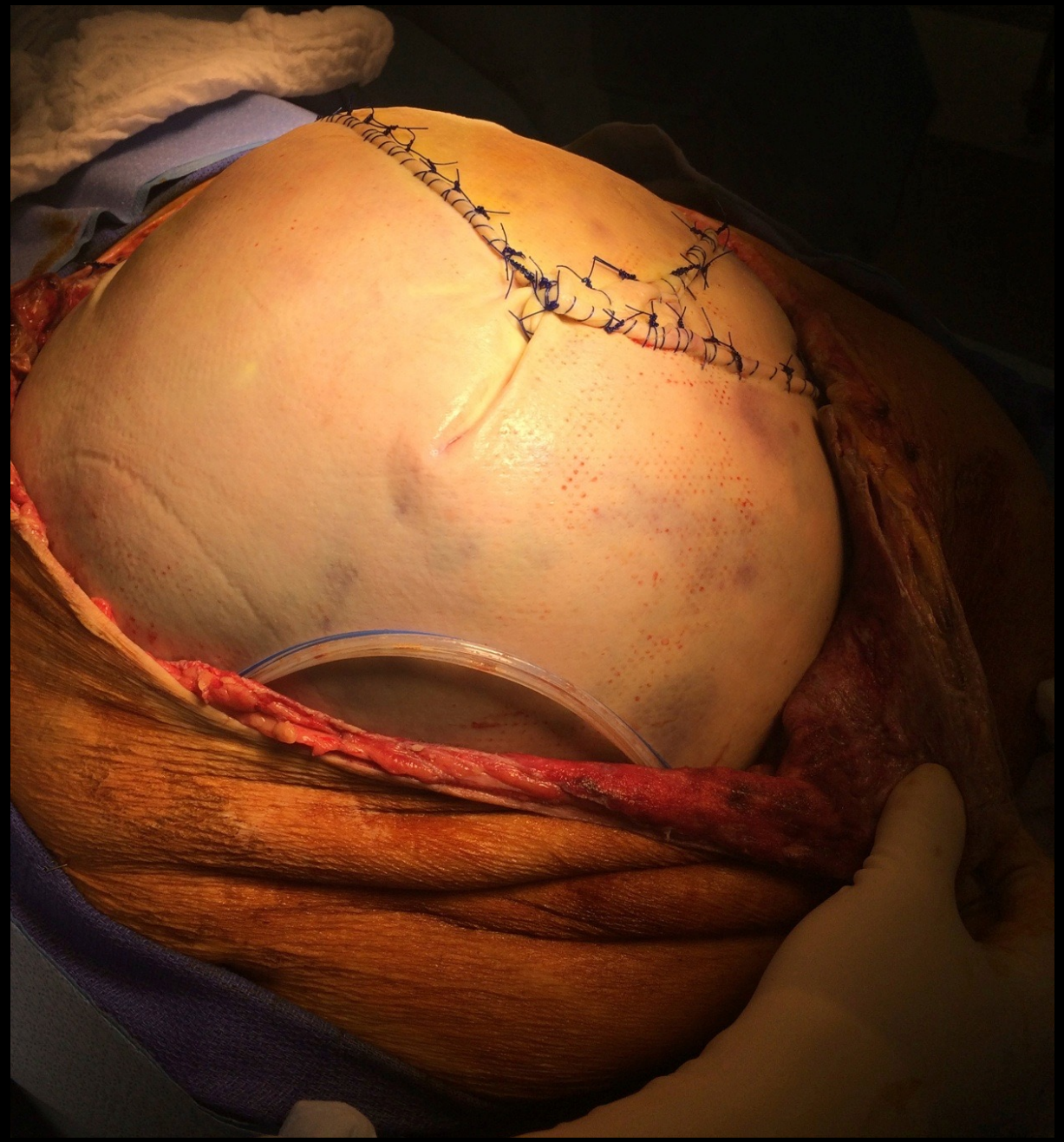

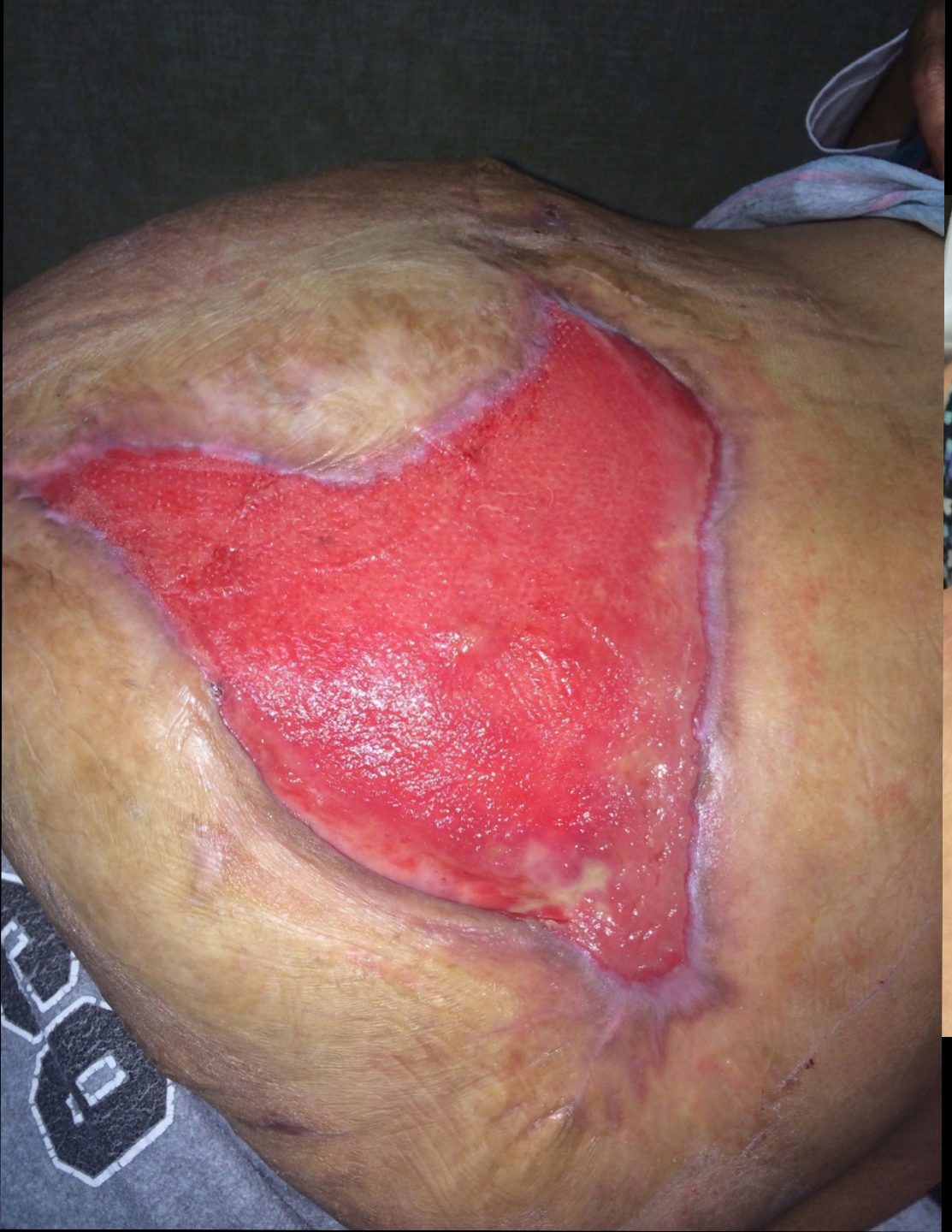

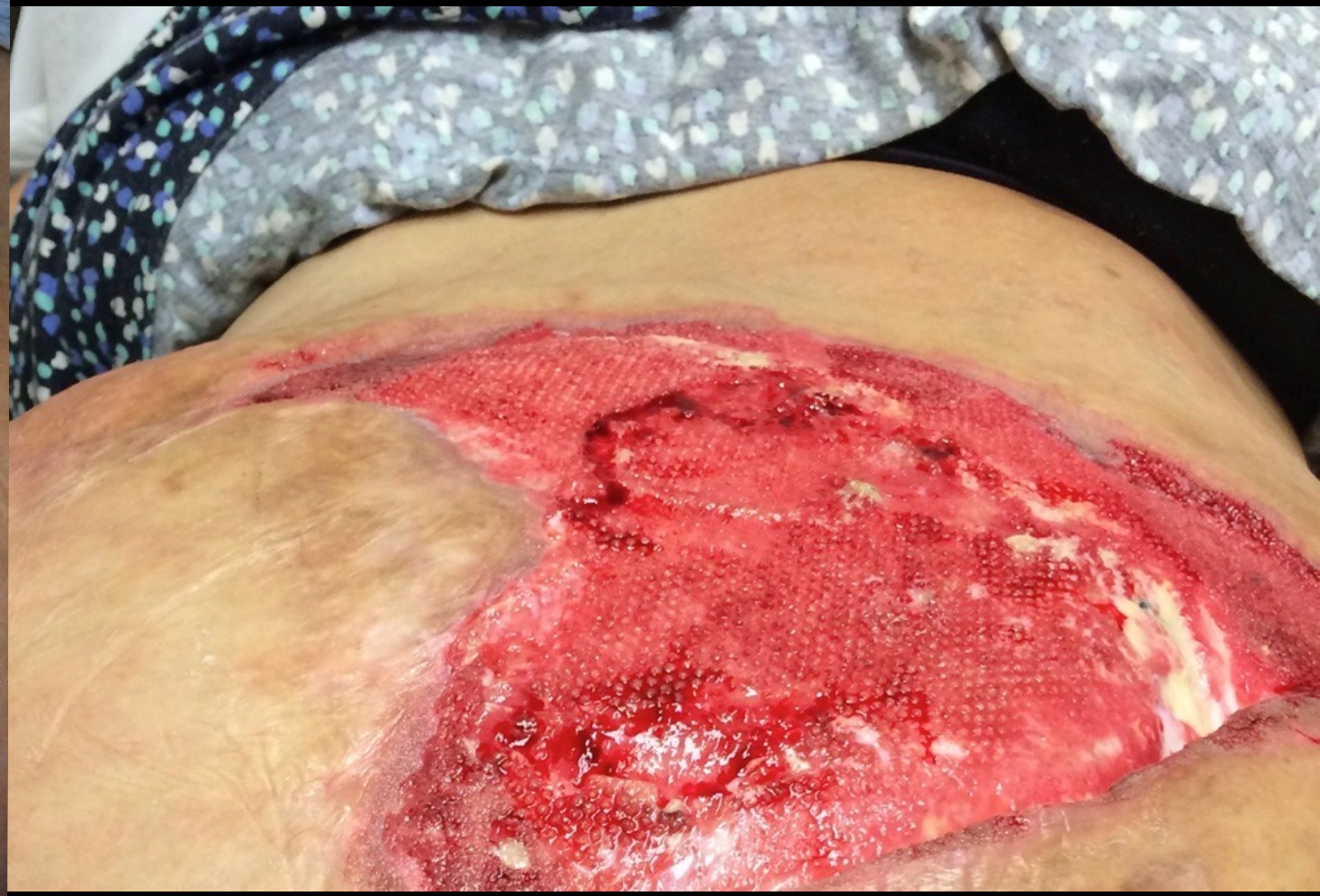

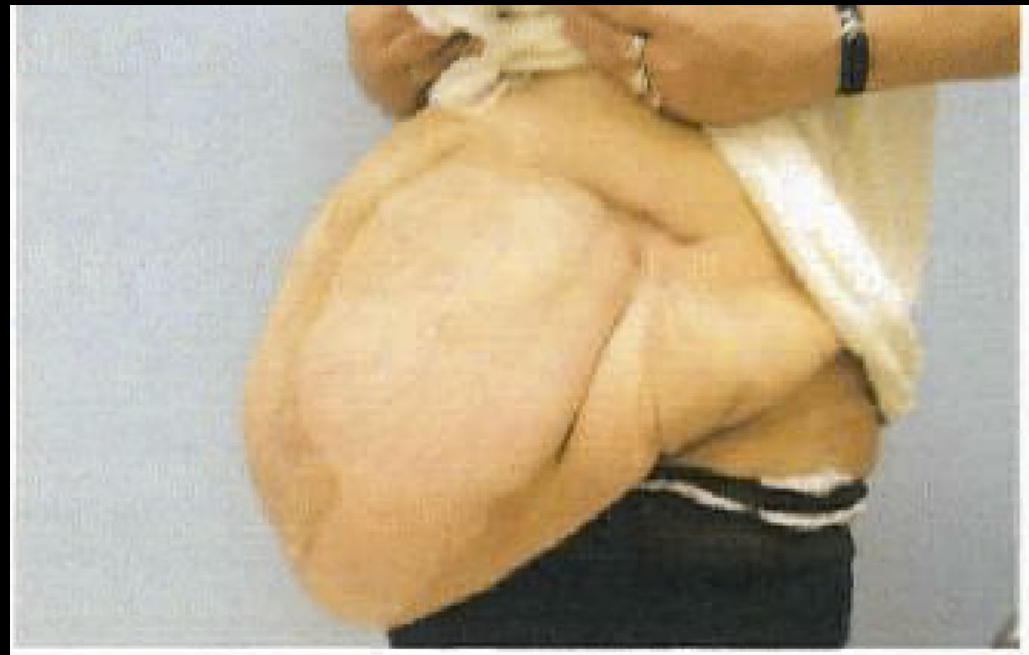

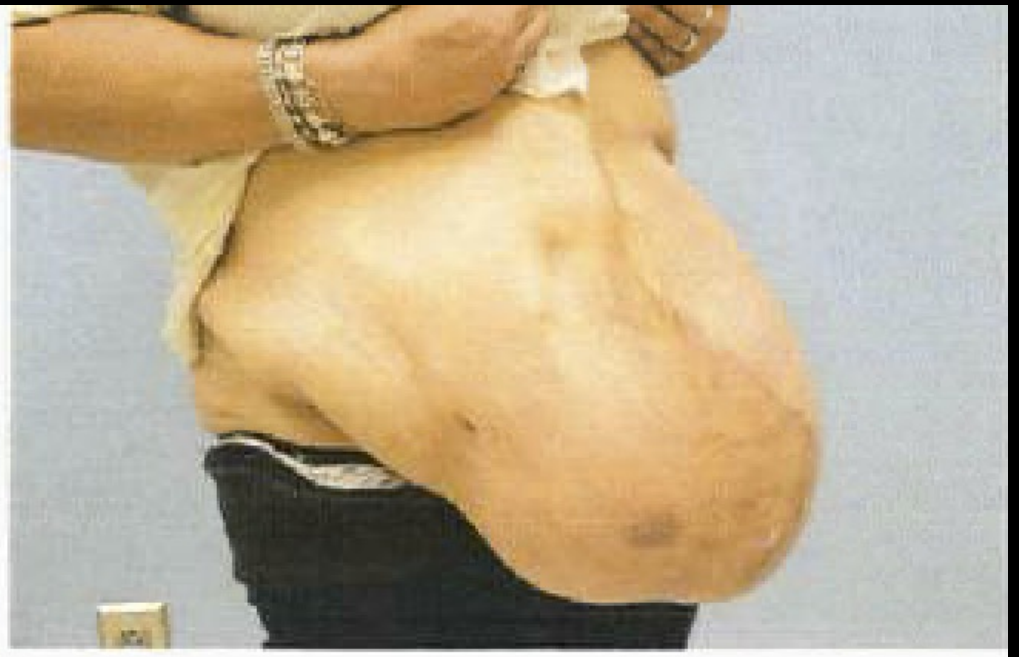

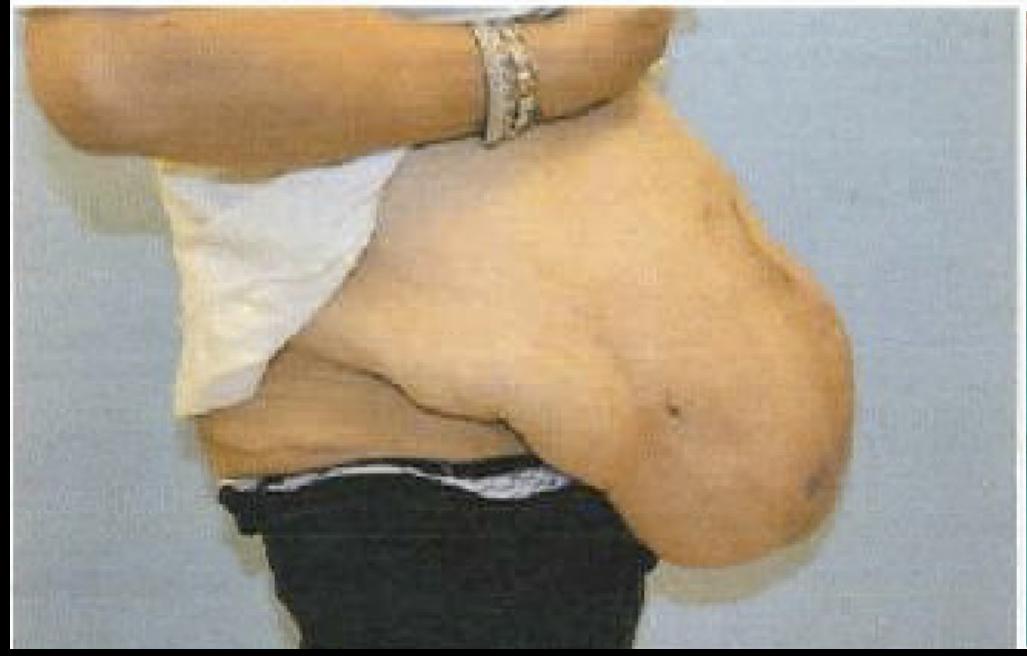

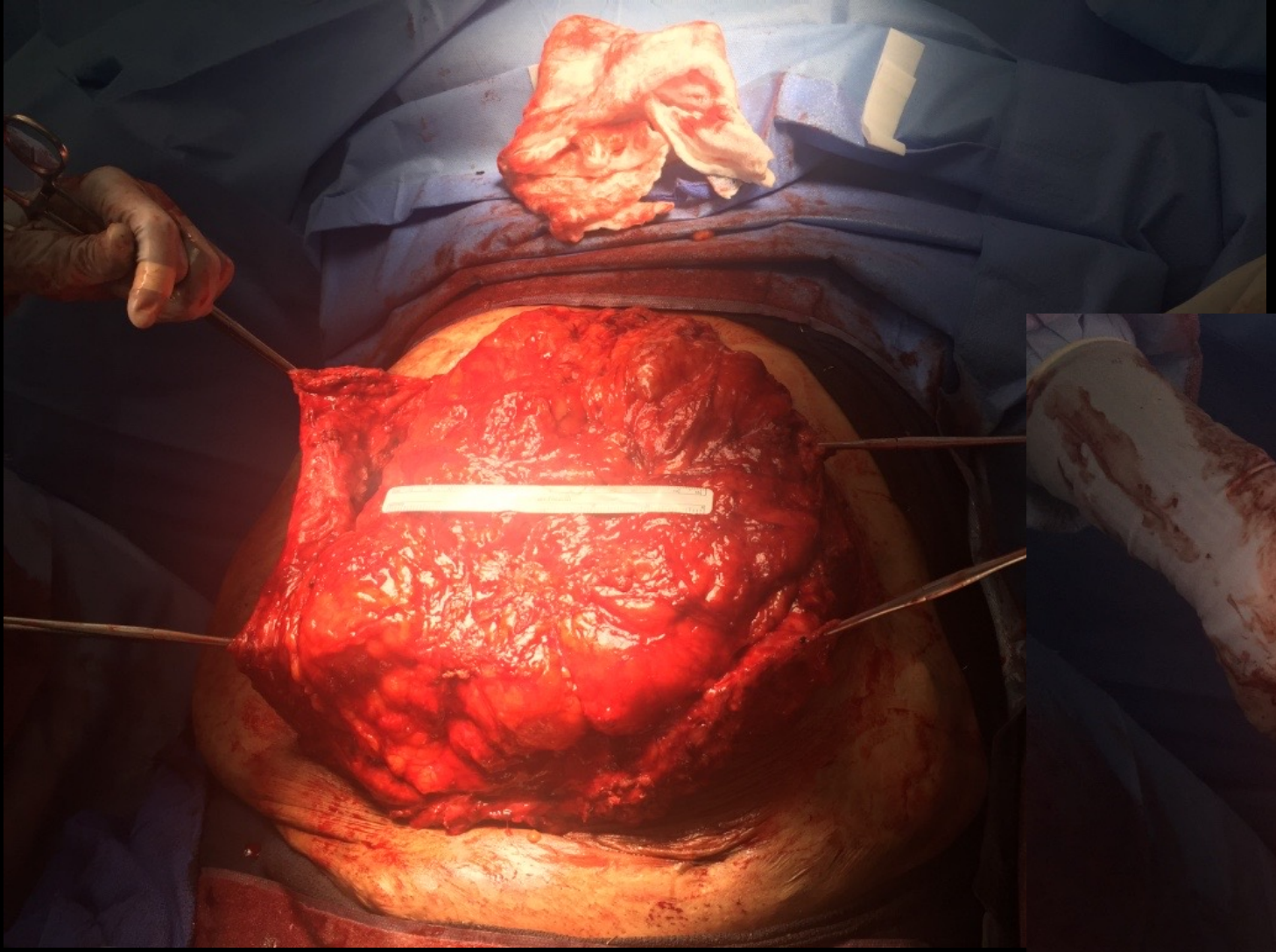

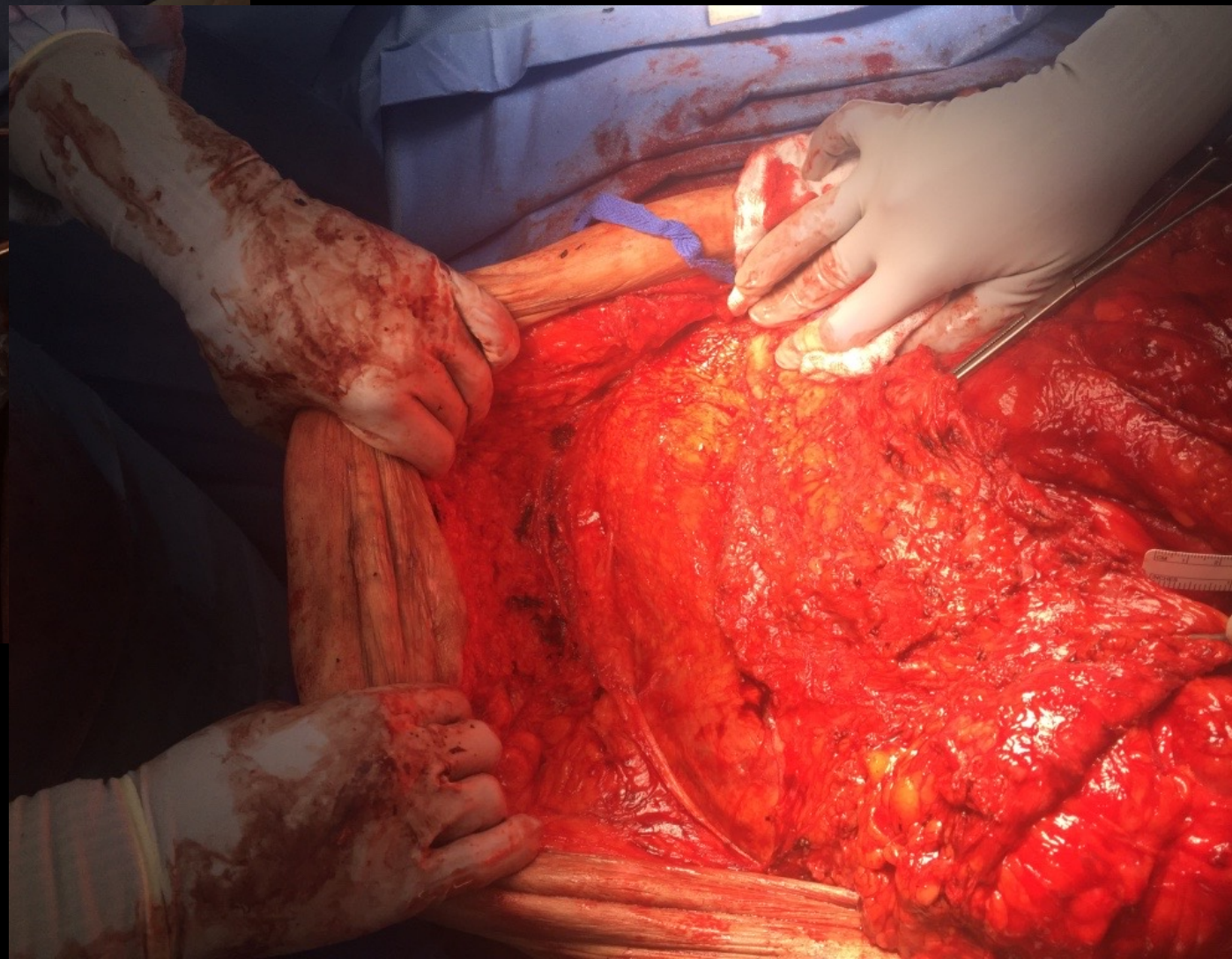

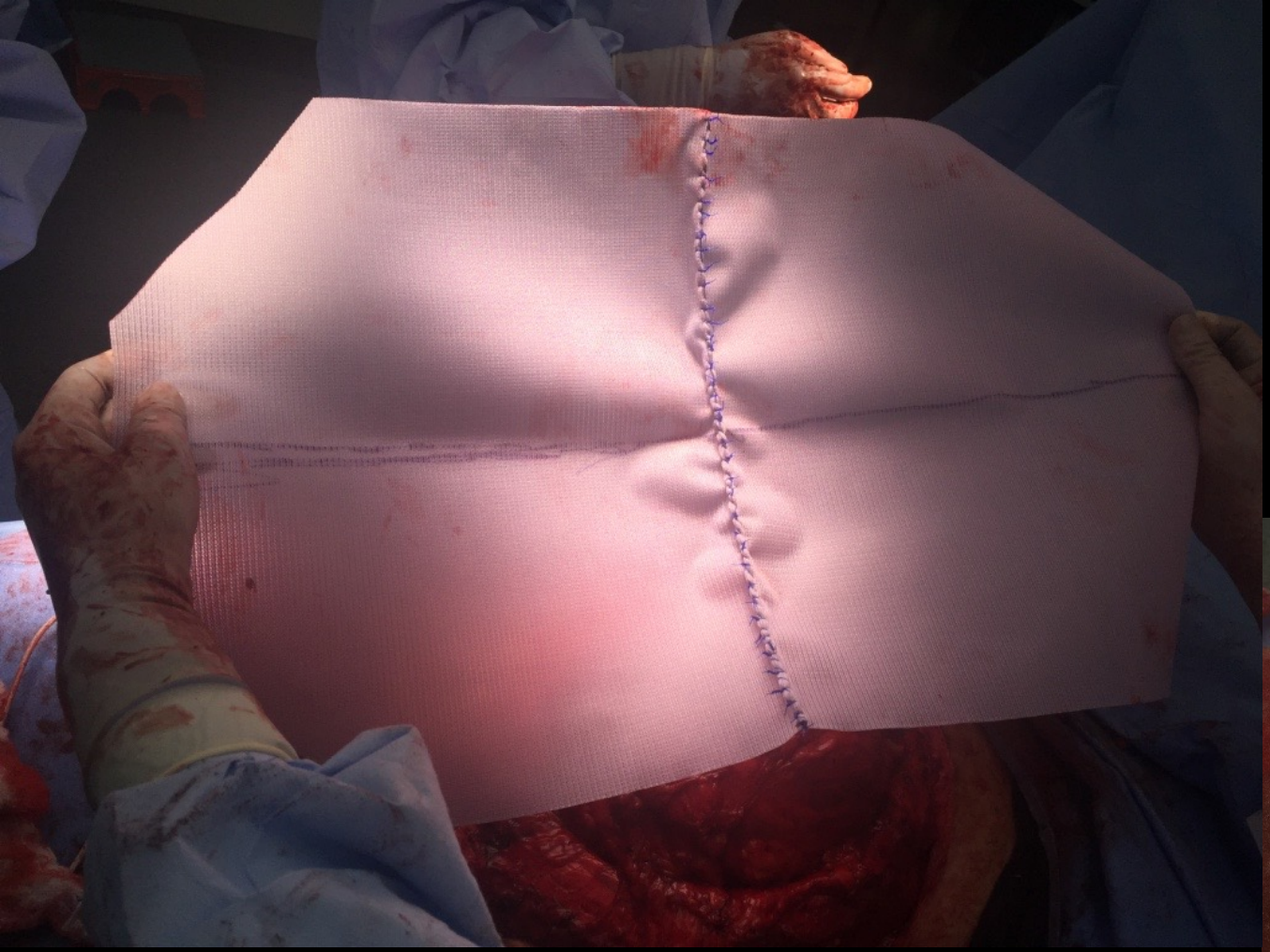

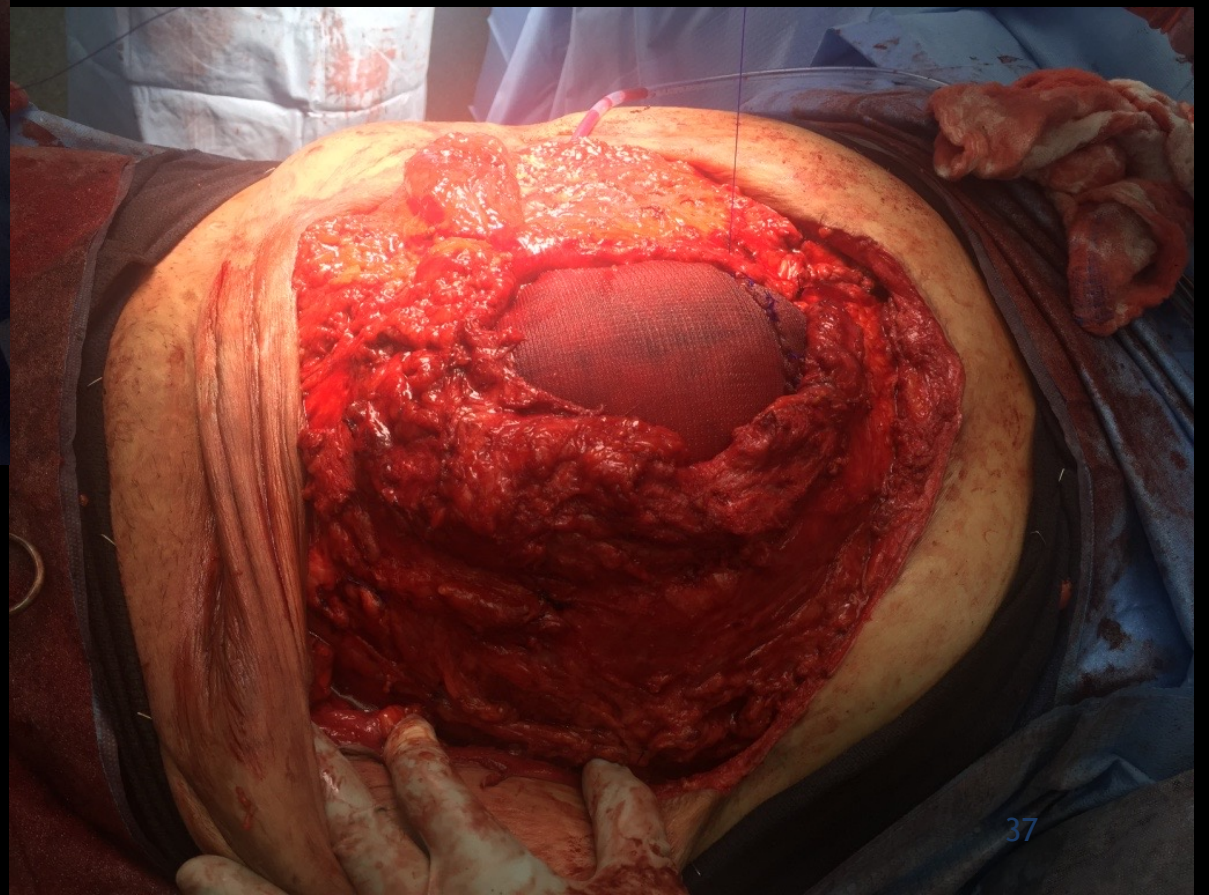

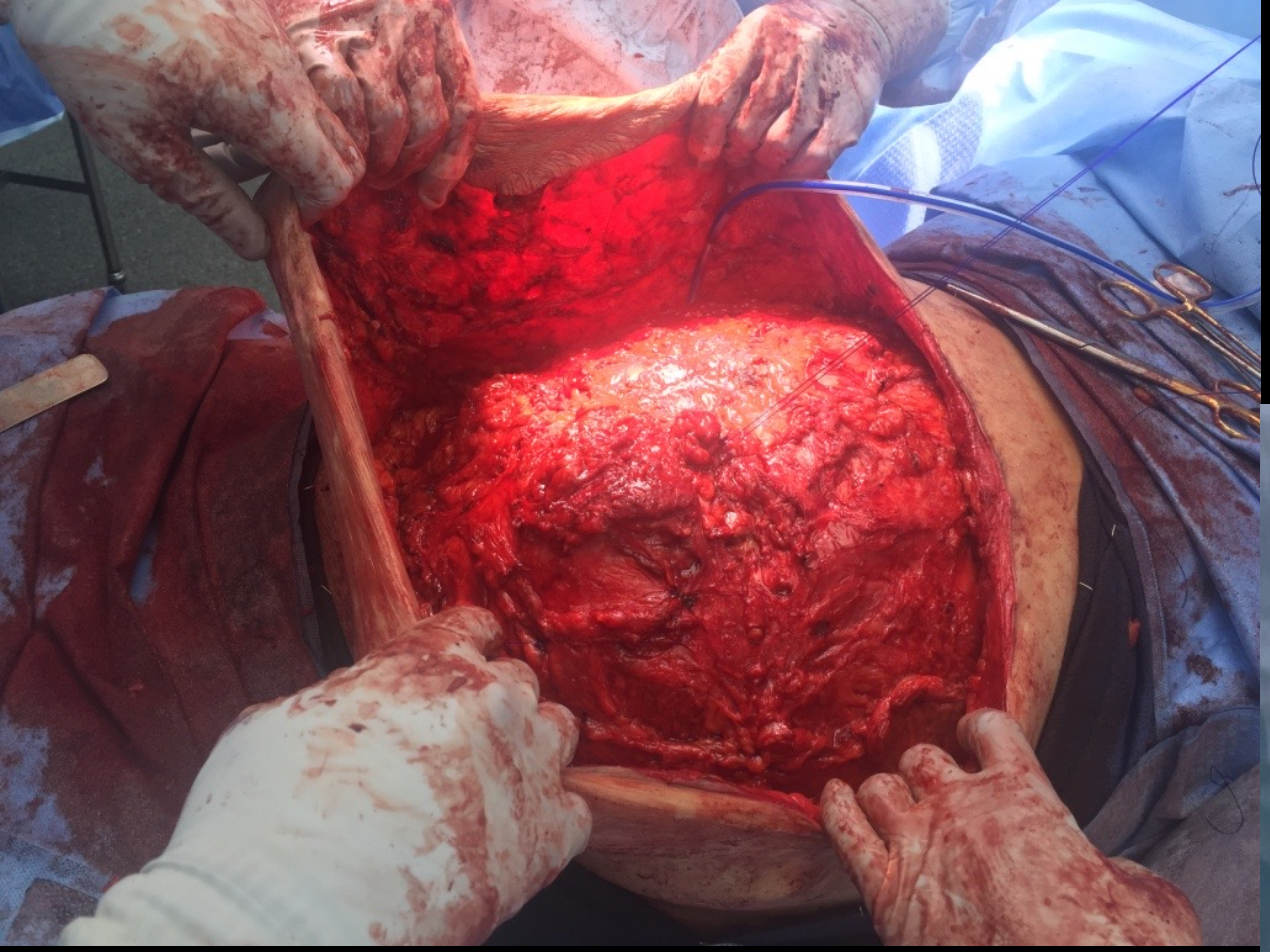

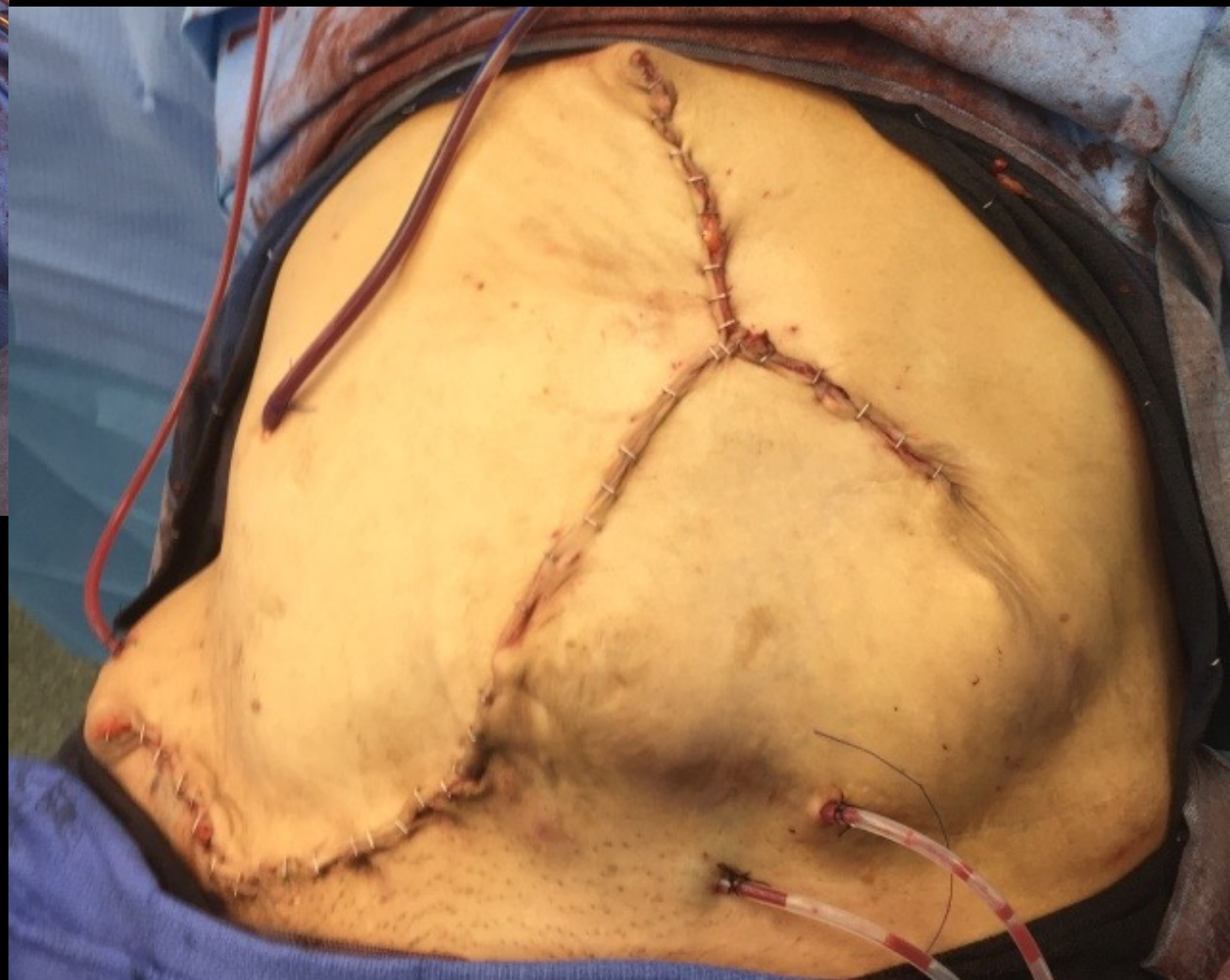

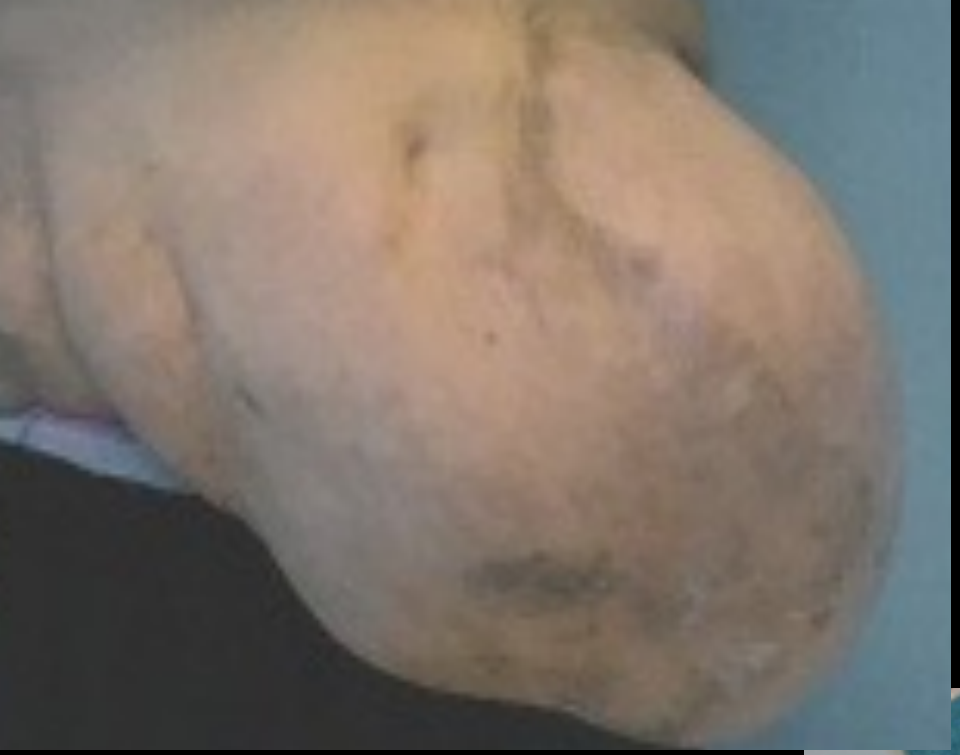

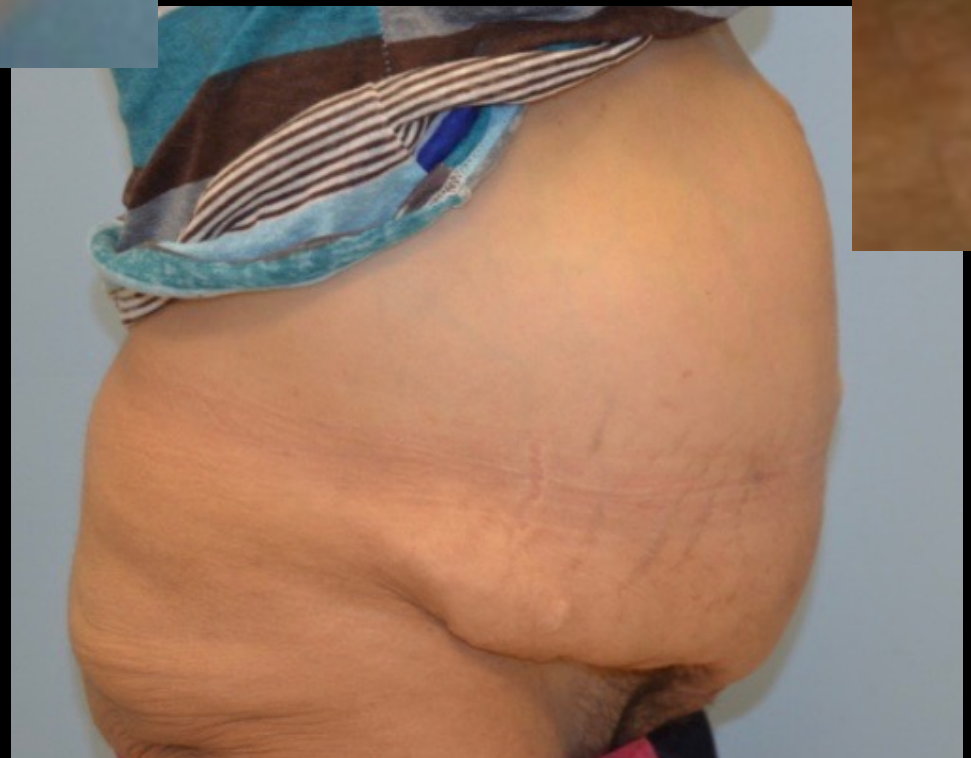

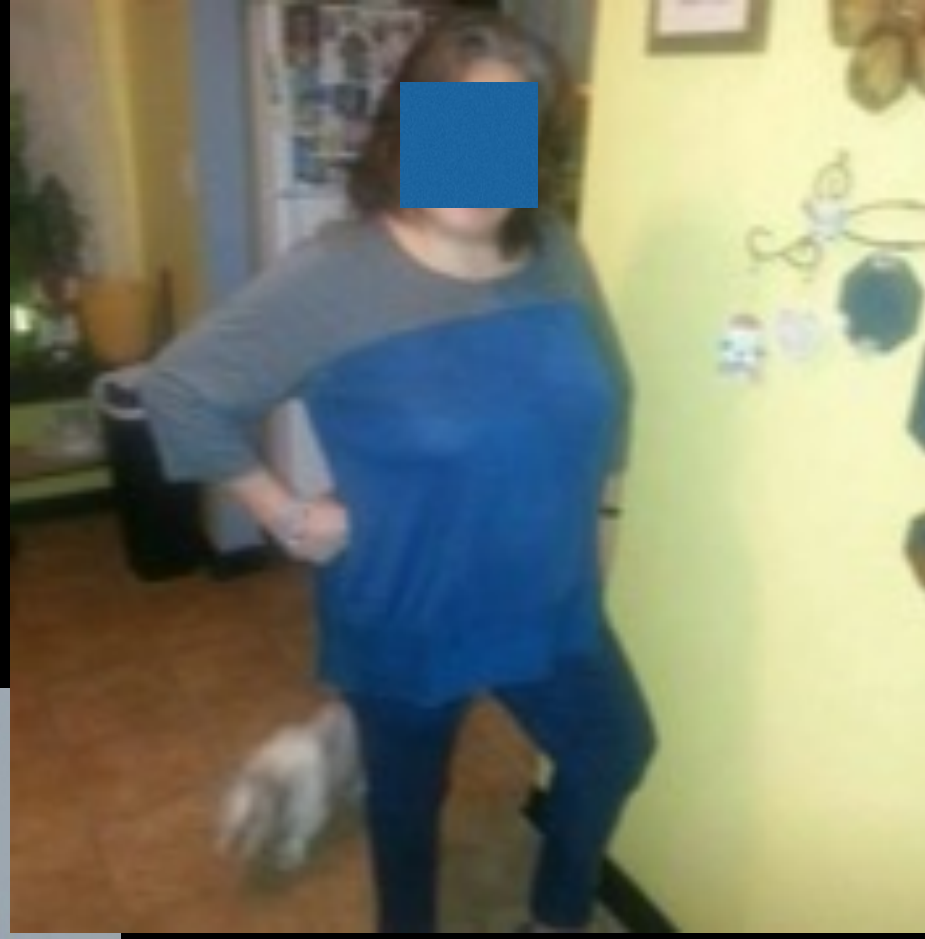

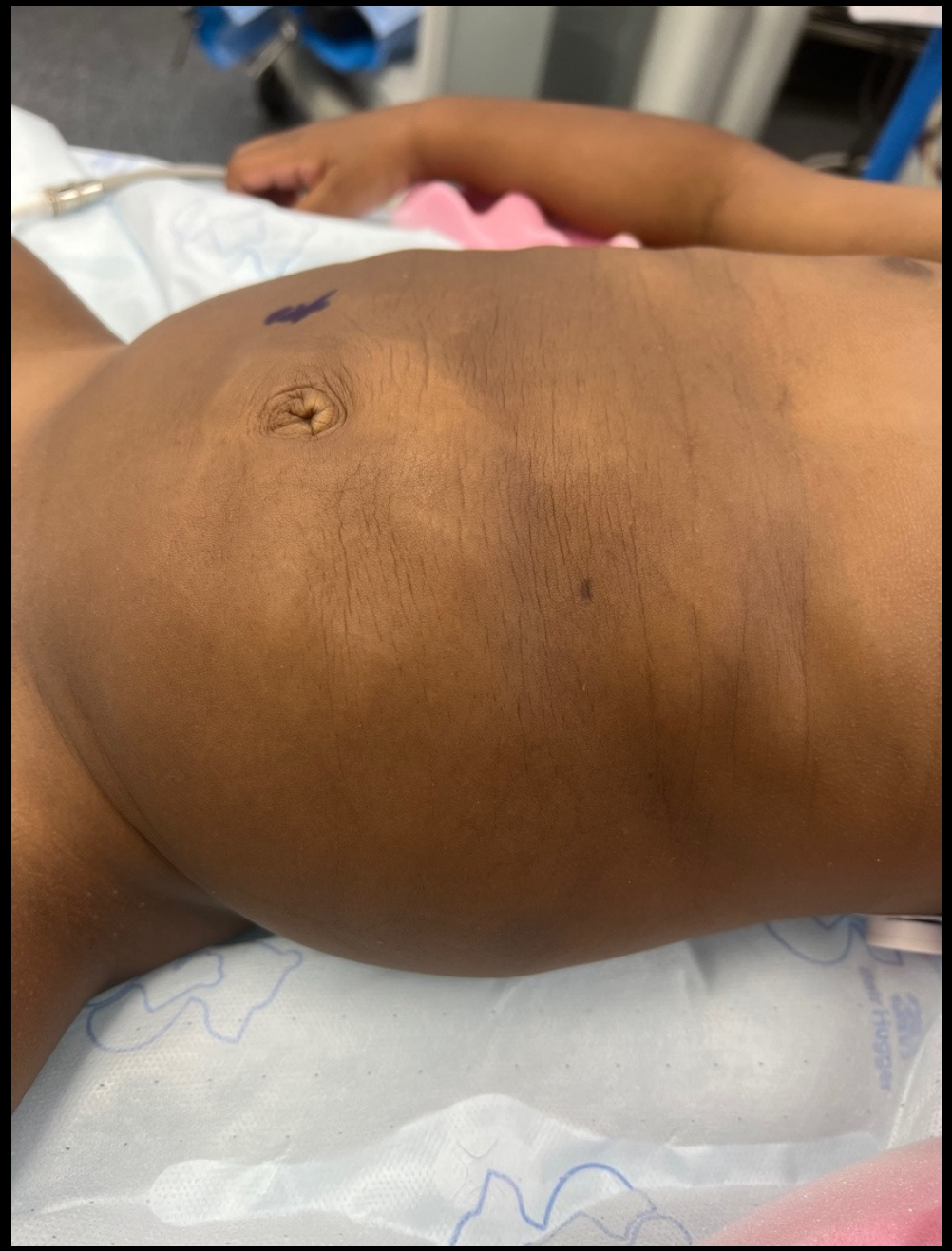

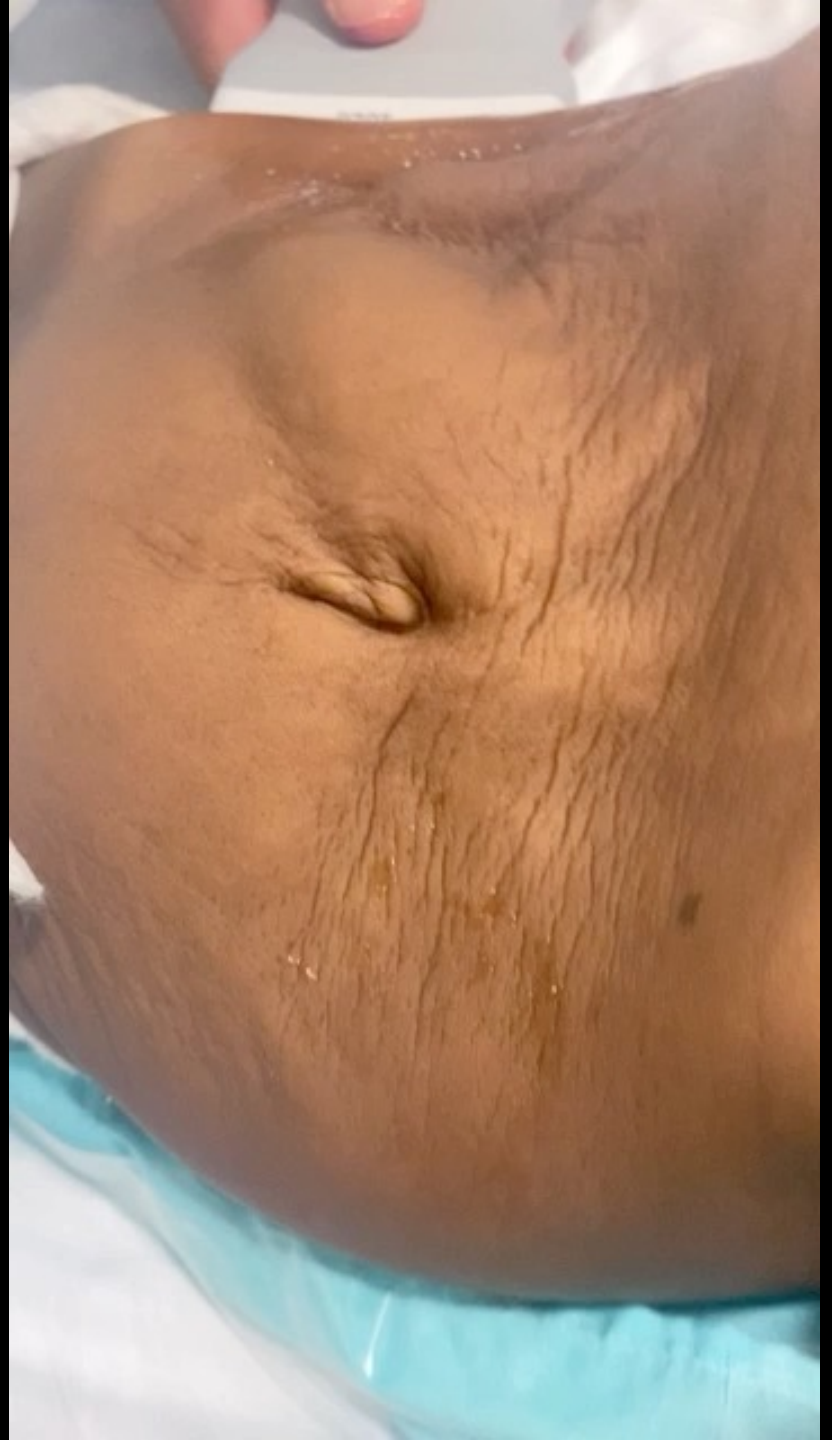

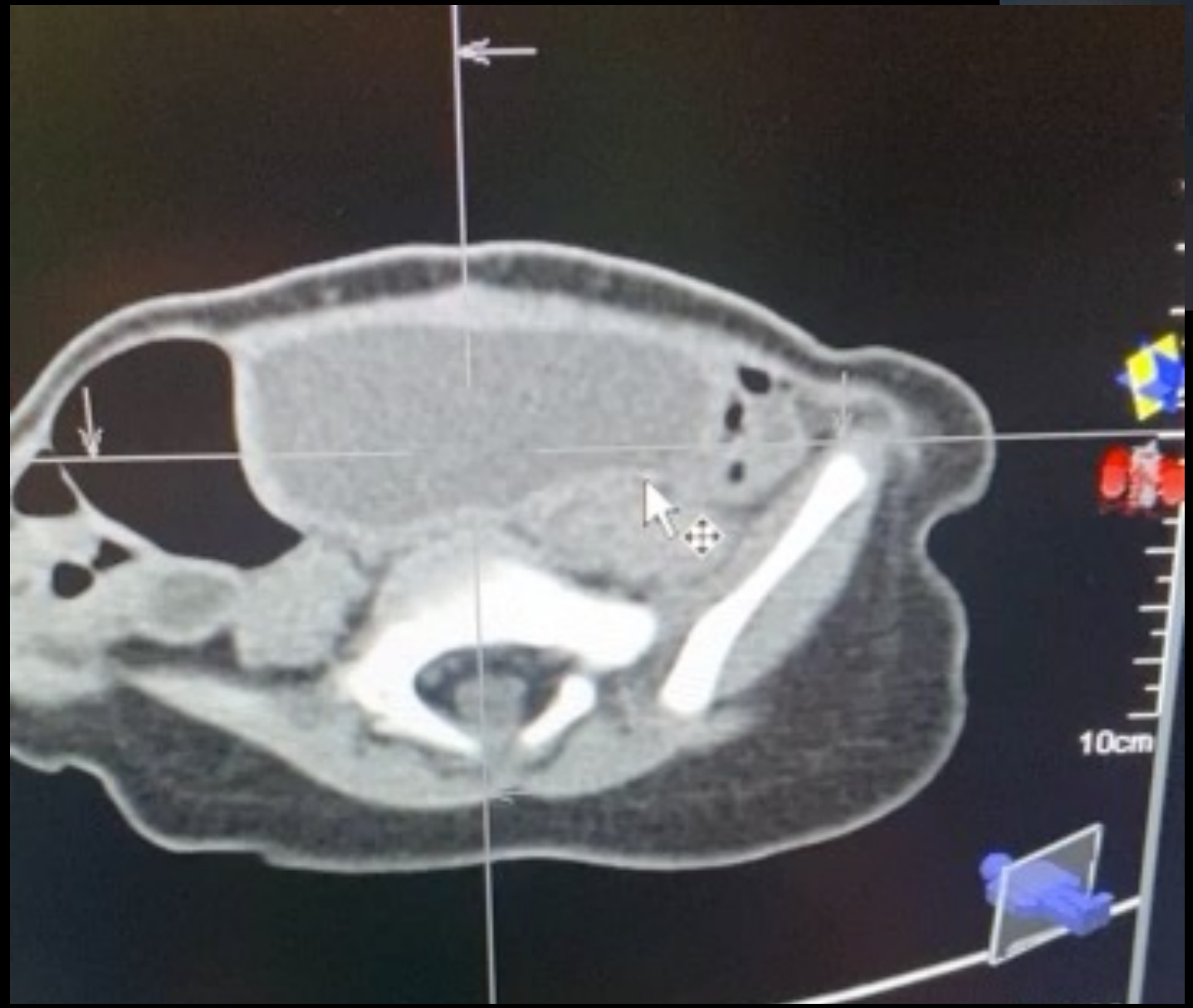
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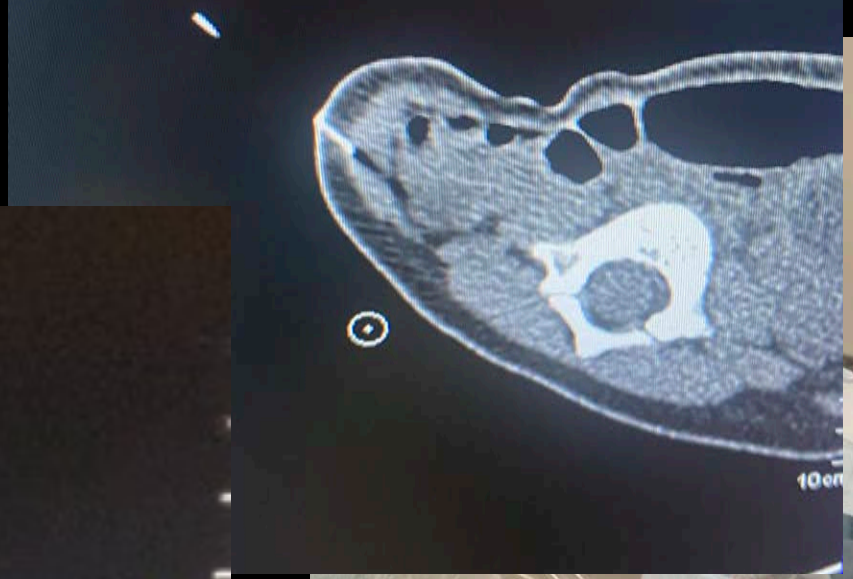

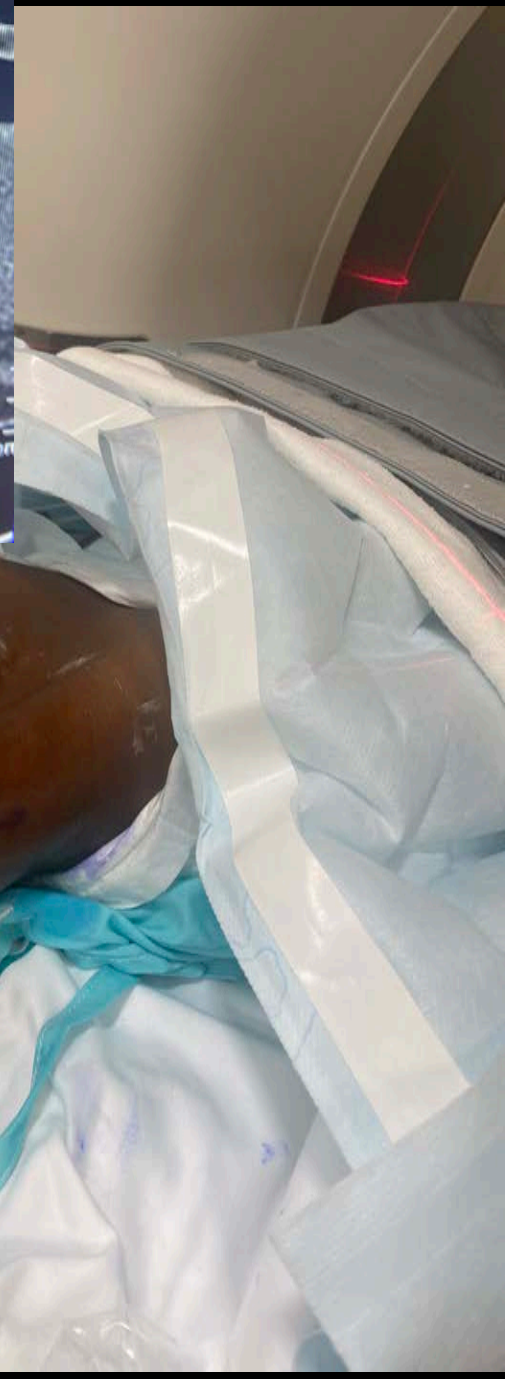

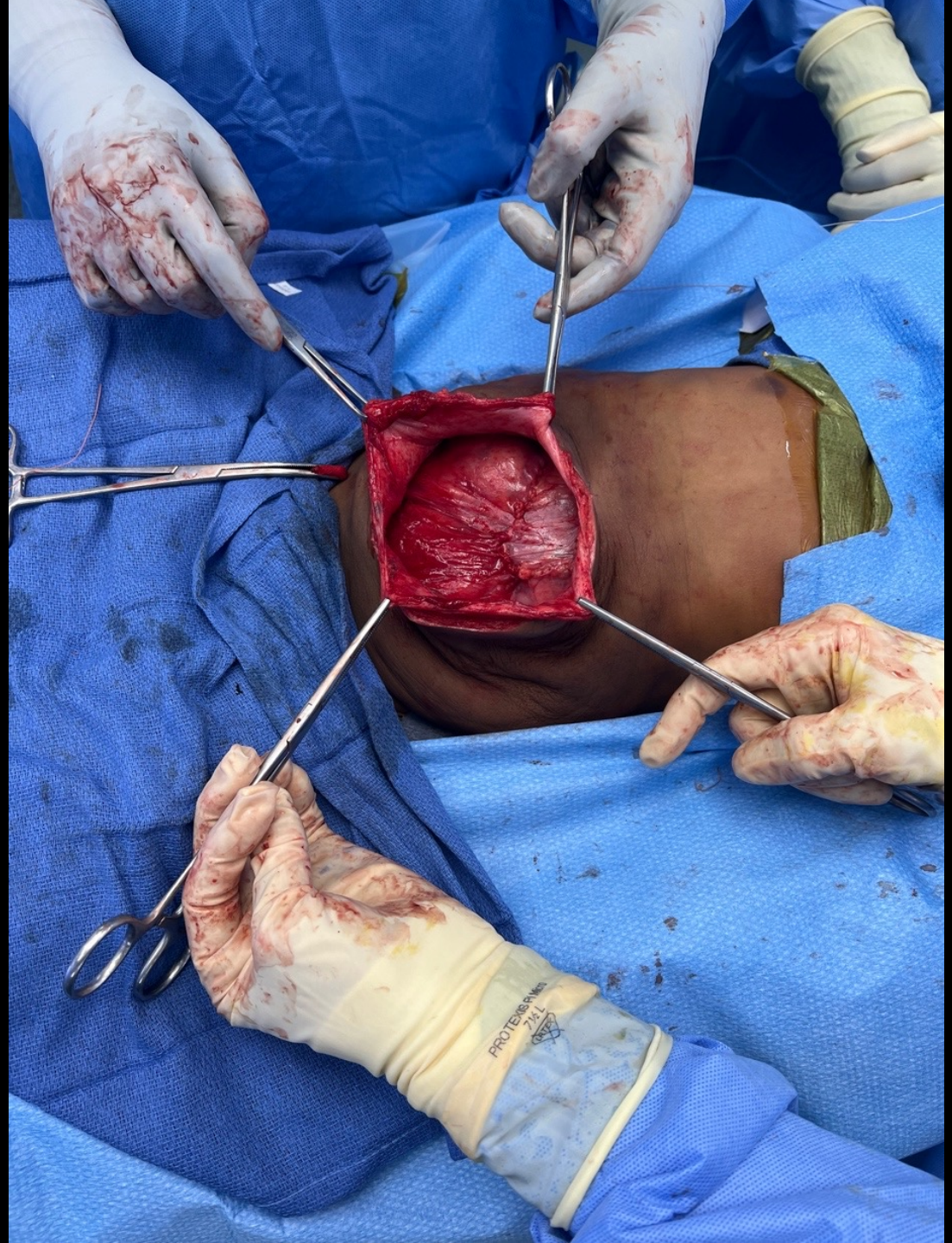
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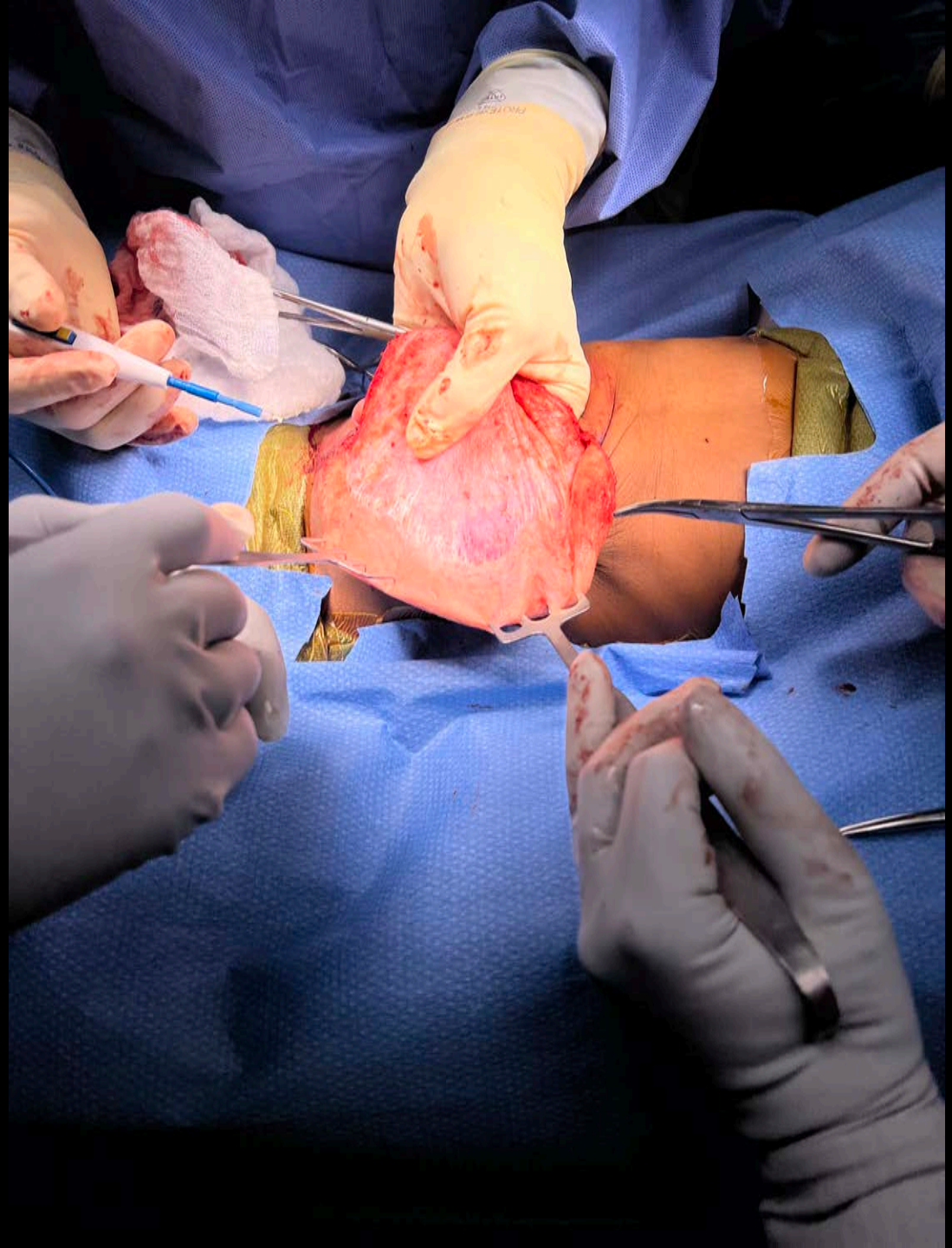

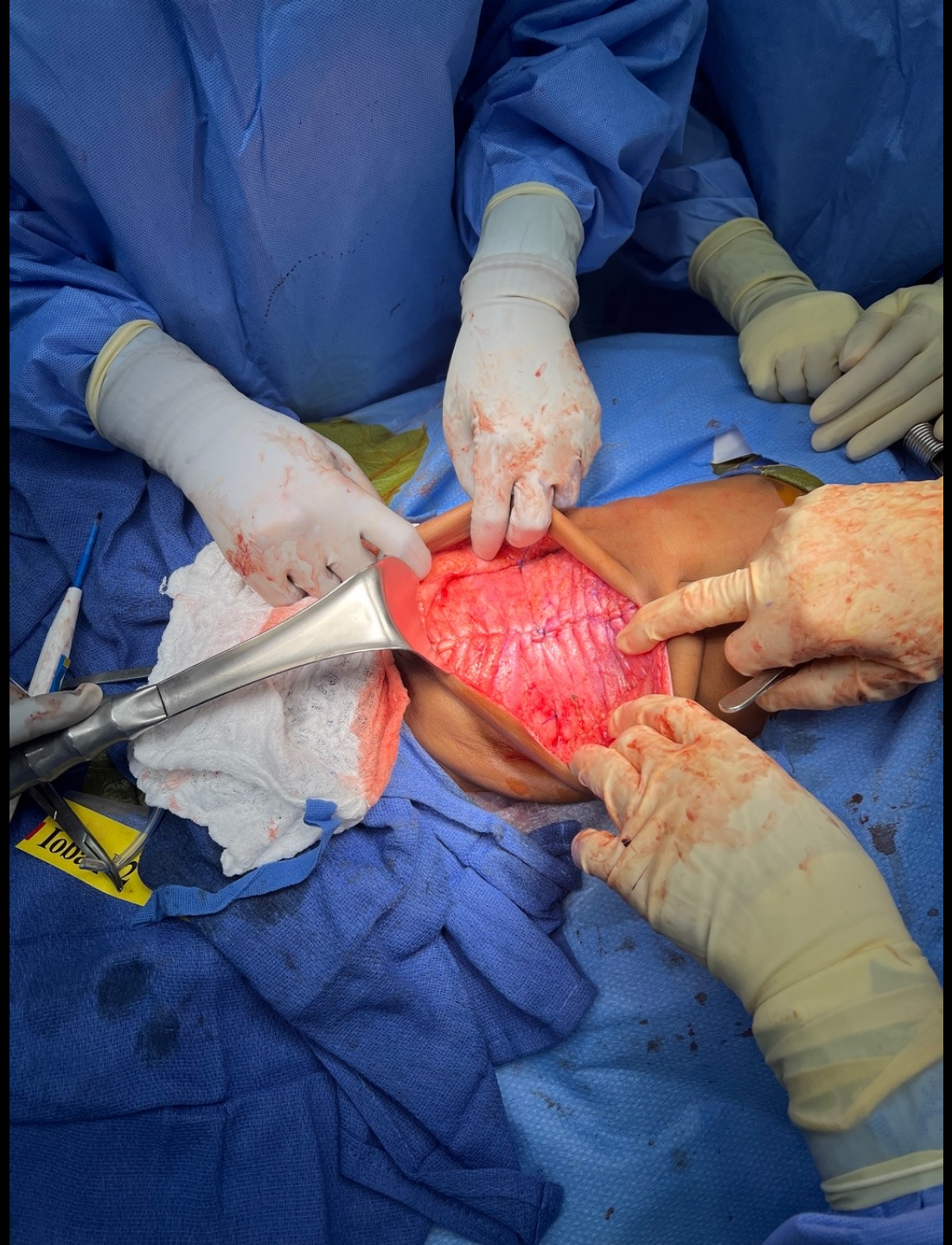

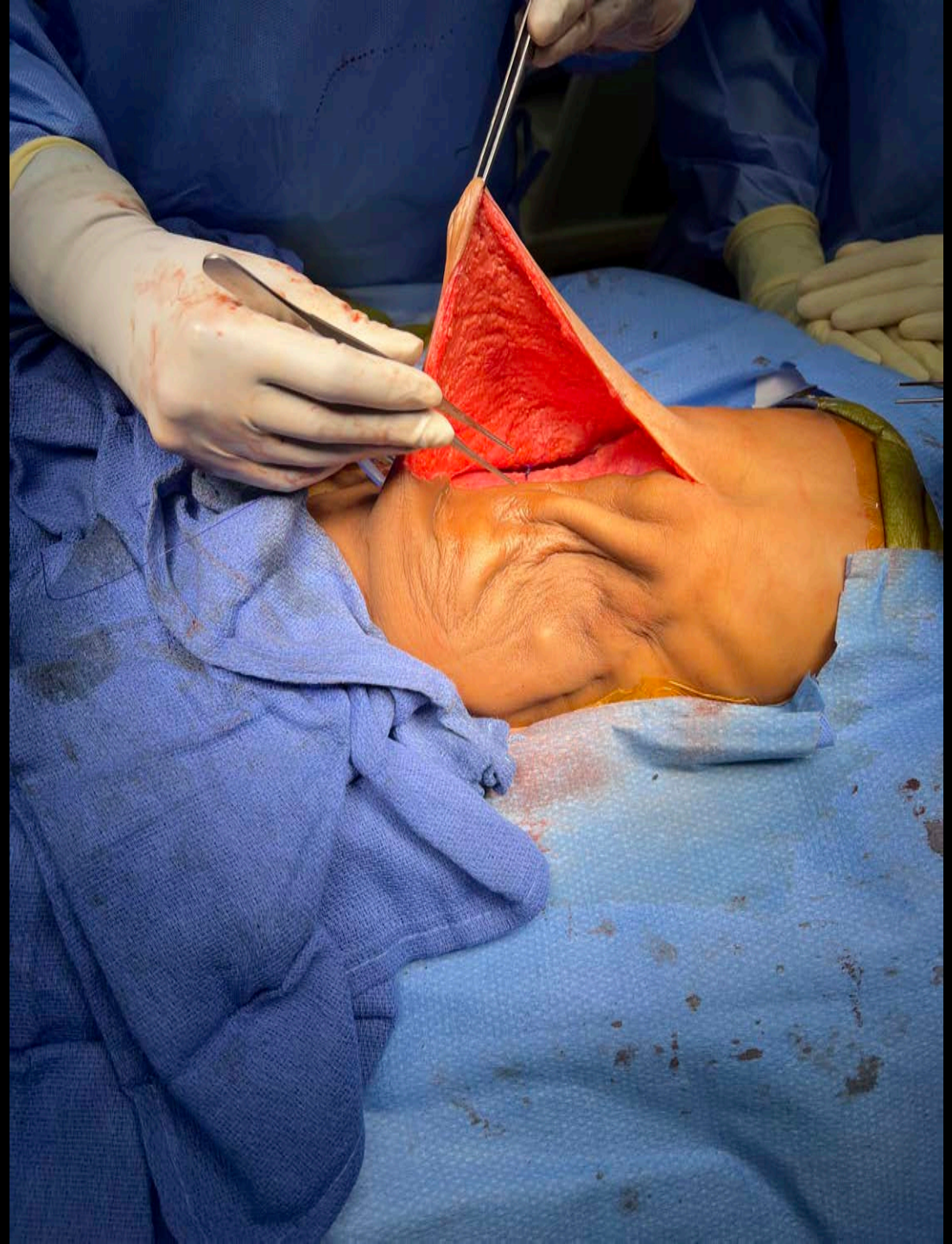

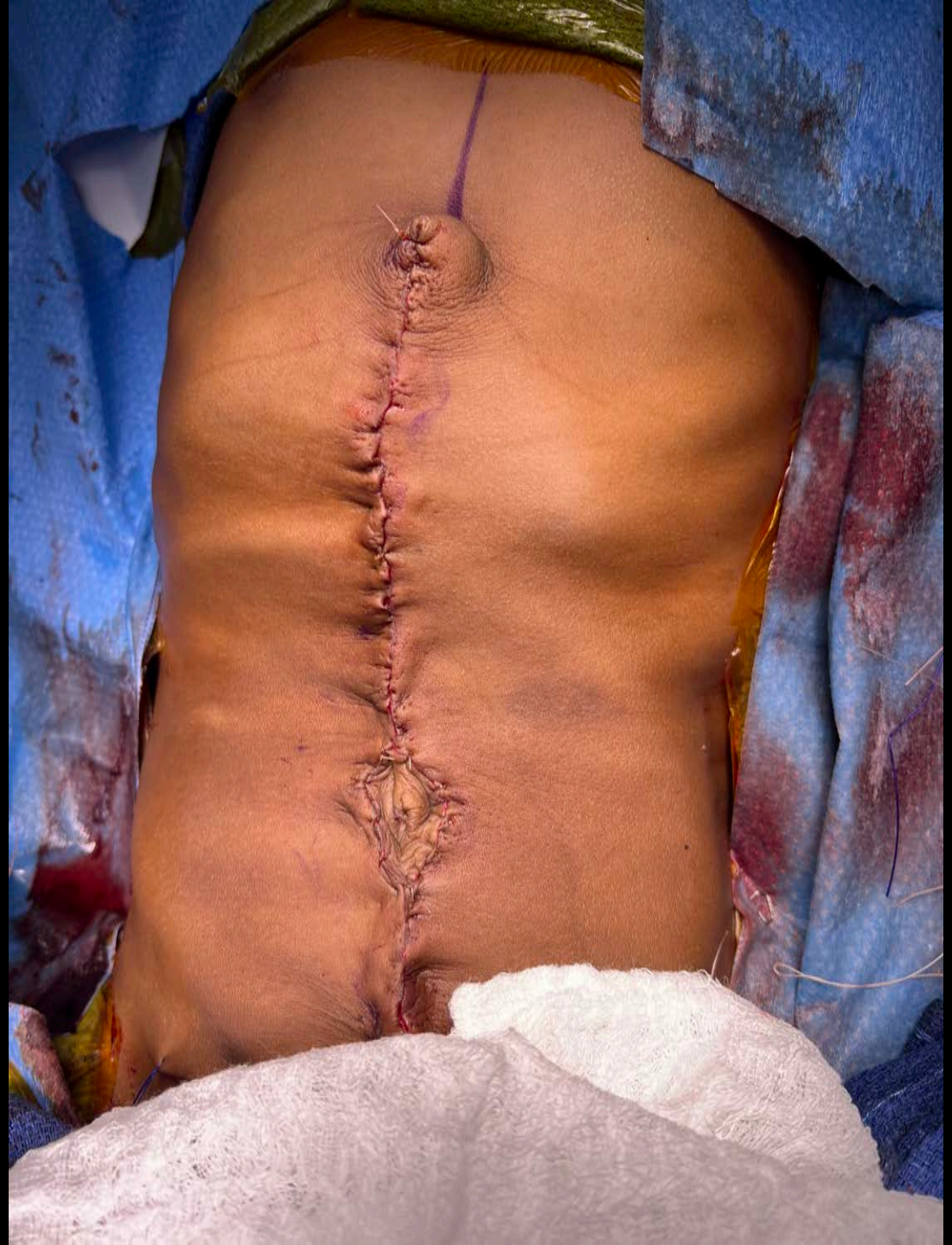

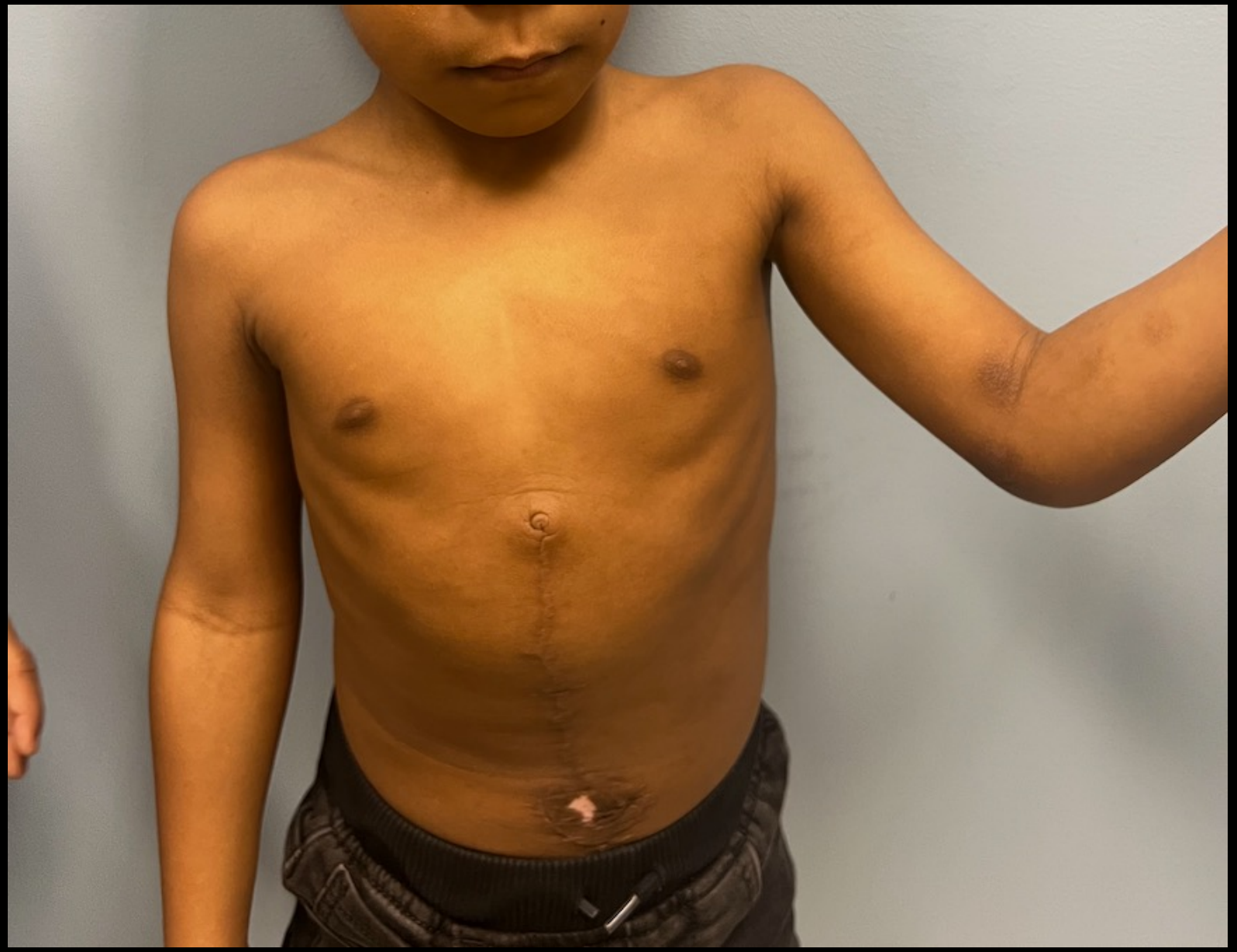

Preperitoneal Ventral Hernia Repair with Abdominal Wall Reconstruction

Maloney, SR MD; Gbozah, KK; Heniford, BT MD; Augenstein, VA MD

Atrium Health

Conclusion

- Consider chemical component separation to avoid cutting muscle to fascia
- Evaluate abdominal wall compliance