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Michigan Hernia Surgery
Expertise in Hernia Care

Robotic Extended Total Extraperitoneal Transversus Abdominus Release for Traumatic Abdominal Intercostal Hernias

Anthony Iacco MD, FACS, Randy Janczyk MD, FACS
Corewell Health William Beaumont University Hospital
Michigan Hernia Surgery

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Disclosures

- Iacco has received proctoring fees from Intuitive
- Fully support the QC (do your QR code and donate)

Background

- Traumatic Abdominal Intercostal Hernias
  - **Valsalva-induced** (MVC, cough, fall)
  - Rare
  - May involve diaphragm as well
  - Usually present late (2-3yr)

- Minimal literature describing robotic repair nor MIS repair

- No literature describing MIS access retromuscular (ETEP/TAR)

CASE REPORT

Traumatic Transdiaphragmatic Intercostal Hernia Secondary to Coughing

Case Report and Review of the Literature

Rogers, Frederick B. MD, FACS; Leavitt, Bruce J. MD, FACS; Jensen, Peter E. MD

Author Information

The Journal of Trauma: Injury, Infection, and Critical Care 41(5):p 902-903, November 1996.

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Hernia. 2021 Dec;25(6):1621-1628. doi: 10.1007/s10029-020-02194-7. Epub 2020 Apr 24.

Primary thoracoabdominal hernias

M Alayon-Rosario [1], K Schlosser [2], T Griscom [2], W Bolton [3], A Hall [1], V Augenstein [2], W S Cobb [1 4], J A Warren [5 6], A M Carbonell [1 4]

Case Reports Hernia. 2023 Jul 4;18(1):212. doi: 10.1186/s13019-023-02320-3.

Non traumatic acquired acute transdiaphragmatic intercostal hernia induced by coughing

June Lee [1], Ju Sang Kim [2], Jin Yong Jeong [3]

Case Reports Med J Armed Forces India. 2023 Jan;79(1):101-104.
doi: 10.1016/j.mjafi.2020.06.012. Epub 2020 Aug 14.

Traumatic abdominal intercostal hernia: A rare experience

Anuj Sharma [1], Samiksha Mehare [2], C R Rakesh [3]

Primary thoracoabdominal hernias

M. Alayon-Rosario[1] · K. Schlosser[2] · T. Griscom[2] · W. Bolton[3] · A. Hall[1] · V. Augenstein[2] · W. S. Cobb[1,4] · J. A. Warren[1,4] · A. M. Carbonell[1,4]

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-16 patients

-15/16 coughing

-most open

-2 robotic

-plating/wire

-combo IP/PP

Table 1 Thoracoabdominal hernia patient characteristics and operative details

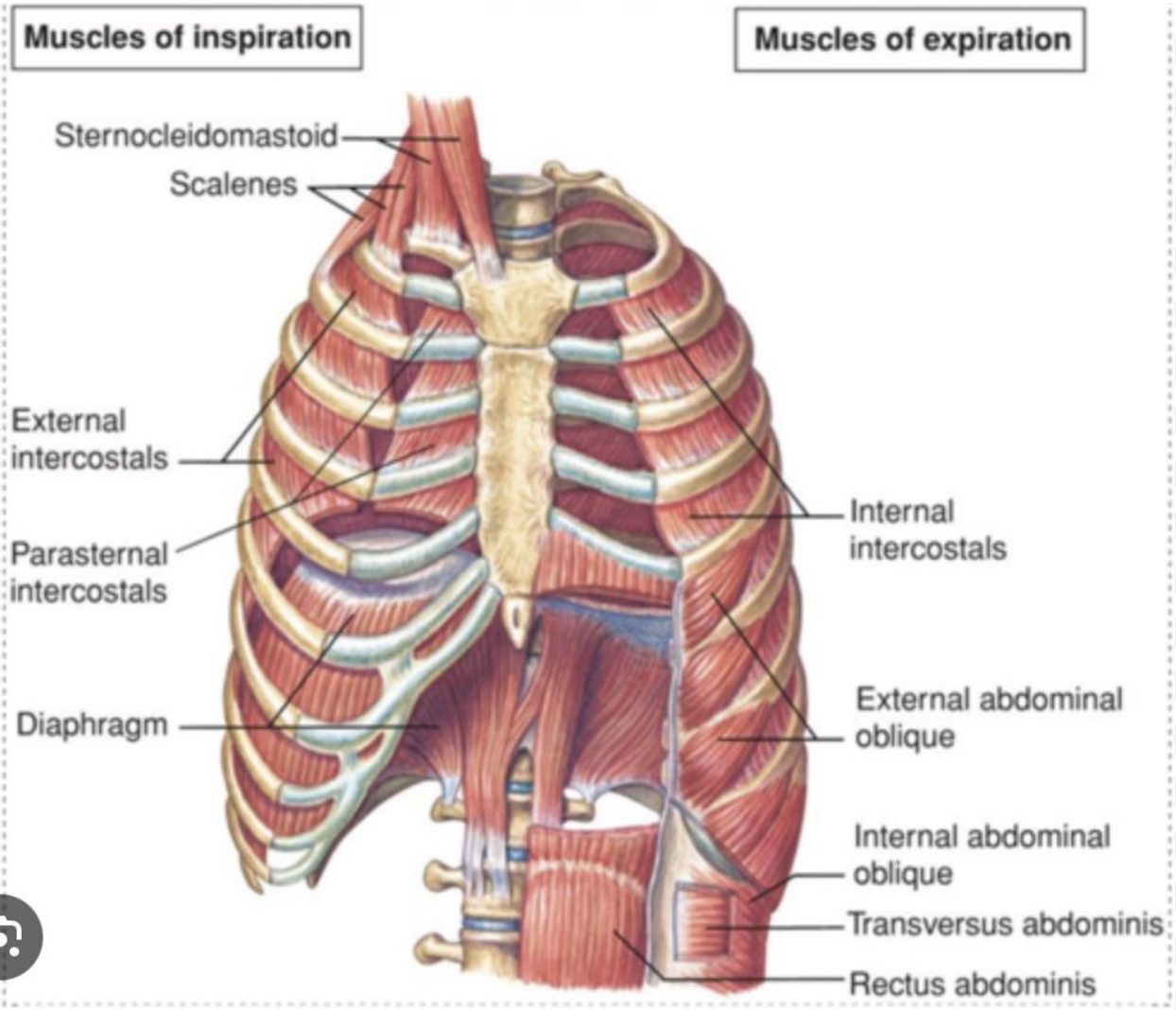
Pt	Age	BMI	Sex	Smoking	COPD	Side	Rib level	Operative approach	Chest repair	Diaphragm repair	Abdominal wall repair	Recur?
1	66	31.3	M	Former	N	R	9–10	Open	AS	PS	Interparietal (between IO and TA) LWPP	Abdominal wall recurrence
1b*						R		Laparoscopic	n/a	n/a	Intraperitoneal ePTFE	
2	43	28.6	M	Current	Y	R	9–10	Open	AS	PS	AS	Chest, diaphragm and abdominal wall recurrence
2b*				Current		R	9–10	Open	Wire	PS	Preperitoneal MWPP	
3	46	41.5	M	Never	N	R	7–8	Open	Plating + wire	n/a	n/a	
4	63	36.8	M	Former	Y	L	9–10	Robotic	AS	PS + mesh	Preperitoneal MWPP	
5	73	29.2	M	Former	Y	R	9–10	Open	Plating + wire	PS	Preperitoneal MWPP	
6	63	34.8	M	Current	Y	R	7–8	Open	Plating + wire	PS + mesh	Preperitoneal MWPP	
7	68	34.3	M	Former	N	L	10–11	Open	AS	PS	Preperitoneal HWPP	
8	61	38.4	M	Never	N	L	8–9, 9–10	Open	Plating + wire	PS	n/a	
8b*								Robotic	n/a	n/a	Preperitoneal MWPP	Unrecognized abdominal defect
9	68	34.6	M	Former	N	R	9–10	Open	Plating + cable	PS	Preperitoneal HWPP	
10	56	32.4	M	Never	N	R	8–9	Open	AS	n/a	n/a	Chest wall recurrence
10b*								Open	Plating + wire	n/a	n/a	
11	72	29	M	Former	N	L	8–9, 9–10	Open	Plating + AS	n/a	n/a	Chest, diaphragm and abdominal wall recurrence
11b*								Open	Plating + cable	PS	Intraperitoneal MWPP	
12	59	32	M	Never	N	L	10–11	Open	PS	PS	Preperitoneal HWPP	
13	66	30.9	M	Never	N	L	9–10	Open	Plating + wire	PS	Preperitoneal HWPP	
14	59	30.85	F	Former	N	R	9–10	Open	Plating + wire	PS	Preperitoneal HWPP	
15	44	32	M	Never	N	L	8–9, 9–10	Open	Plating + cable	n/a	n/a	
16	44	32.4	M	Former	N	L	7–8	Open	Plating + cable	PS	n/a	

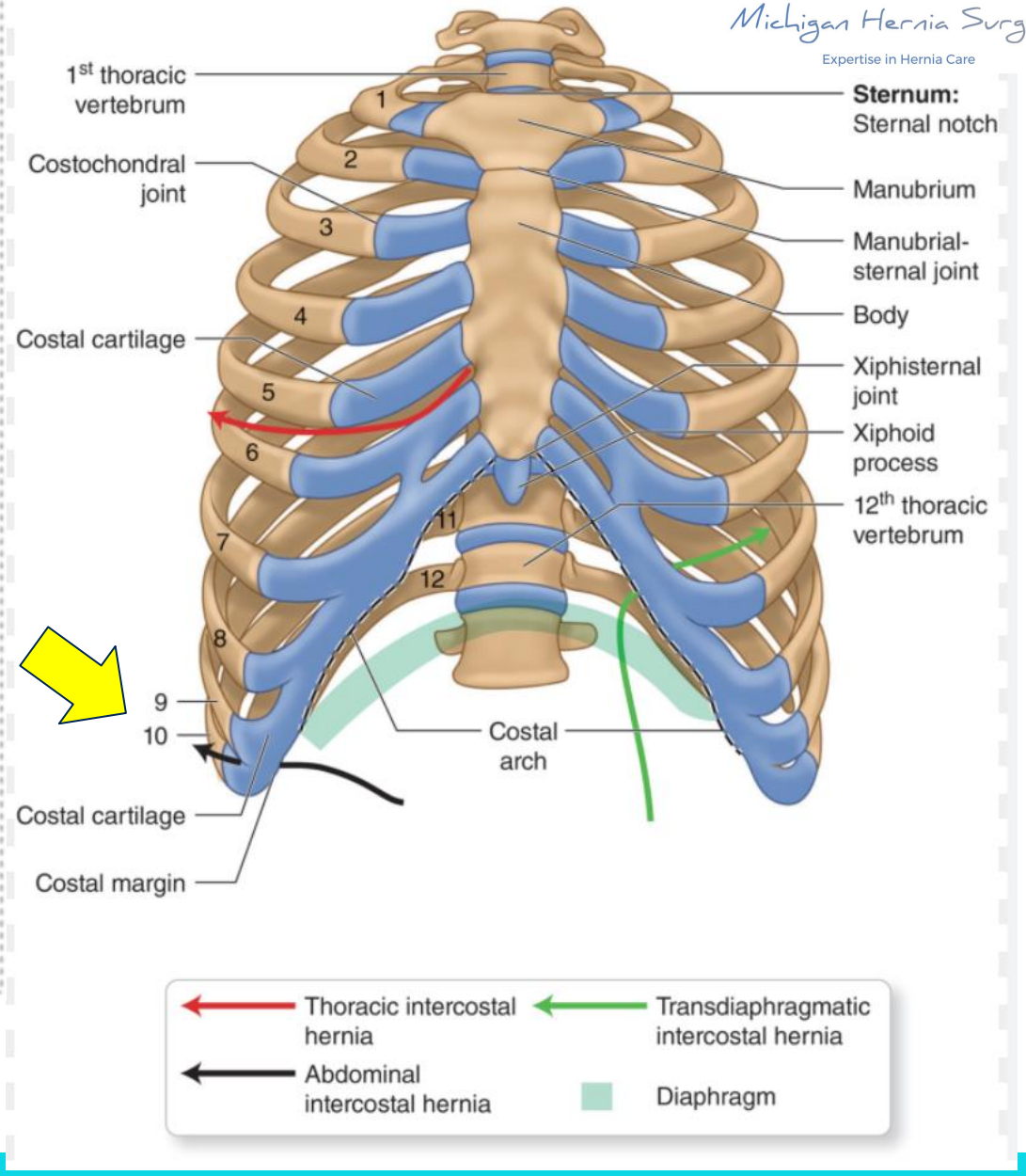
M male, *F* female, *Y* yes, *N* no, *R* right, *L* left, *AS* absorbable suture, *PS* permanent suture, *LWPP* light-weight polypropylene, *MWPP* mid-weight polypropylene, *HWPP* heavy-weight polypropylene *IO* internal oblique muscle, *TA* transversus abdominis muscle, *ePTFE* expanded polytetrafluoroethylene, *n/a* not applicable

*Denotes a recurrent hernia repair

Methods

- All patients 2019-2022, entered into ACHQC Database
- N=8, 4 M and 4 F BMI 32
- Traumatic Valsalva-induced hernias
- Presented with abdominal wall pain ~3 years after injury
- Average defect size 11x17cm


Muscles of inspiration
Muscles of expiration
Sternocleidomastoid
Scalenes
External intercostals
Parasternal intercostals
Diaphragm
Internal intercostals
External abdominal oblique
Internal abdominal oblique
Transversus abdominis
Rectus abdominis


1st thoracic vertebrum
Costochondral joint
Costal cartilage
Costal cartilage
Costal margin
Sternum: Sternal notch
Manubrium
Manubrial-sternal joint
Body
Xiphisternal joint
Xiphoid process
12th thoracic vertebrum
Costal arch
1
2
3
4
5
6
7
8
9
10
11
12
Thoracic intercostal hernia
Transdiaphragmatic intercostal hernia
Abdominal intercostal hernia
Diaphragm

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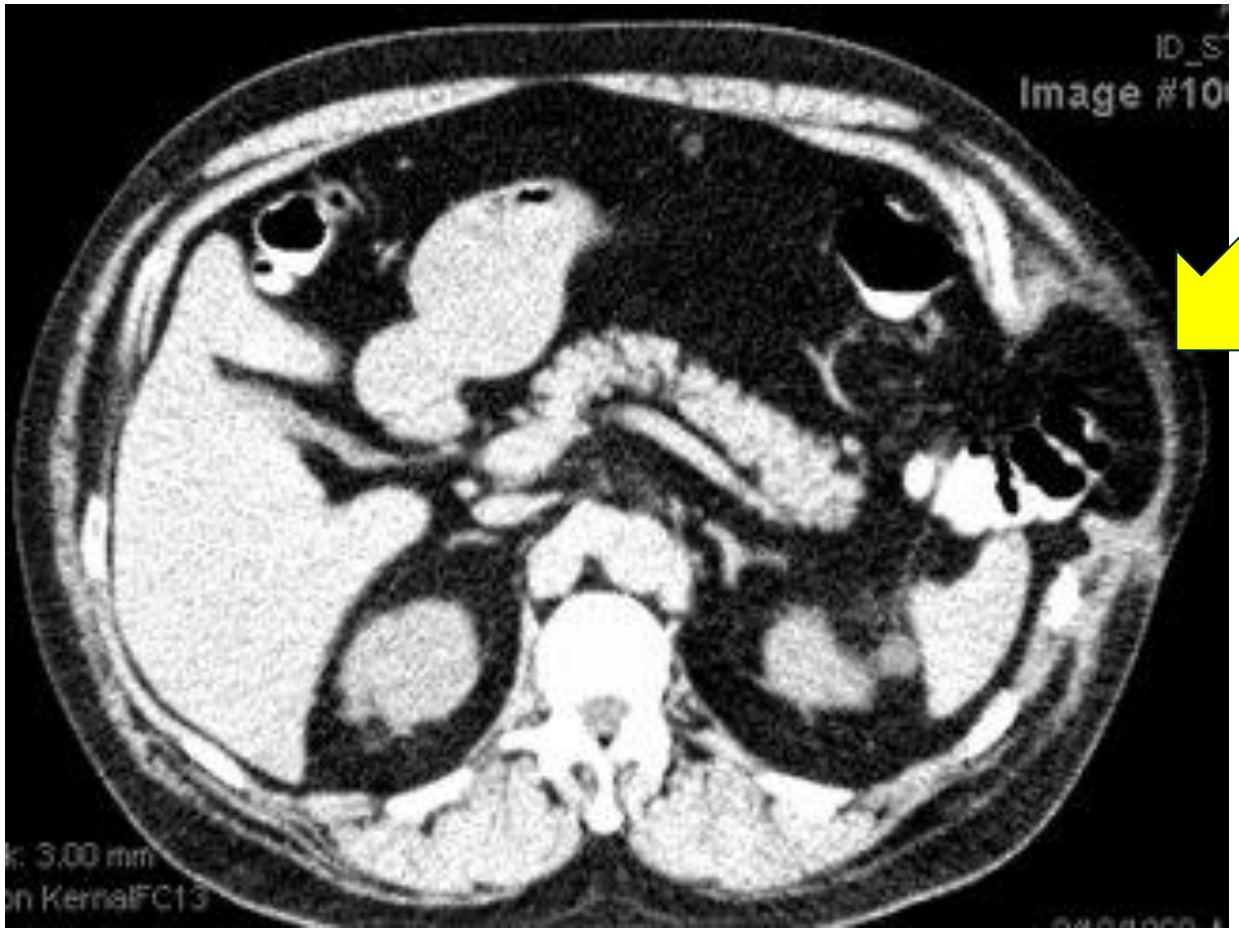

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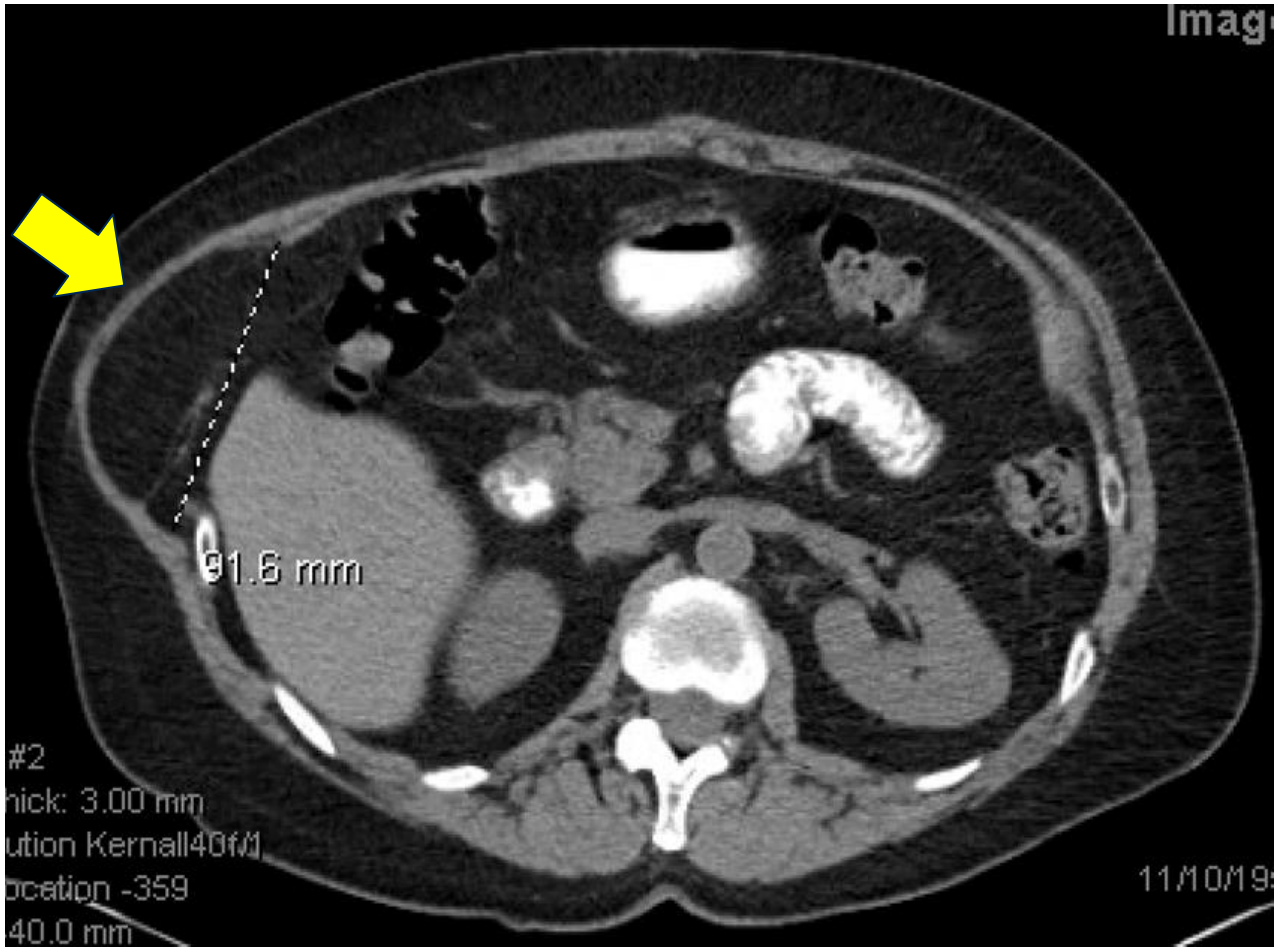
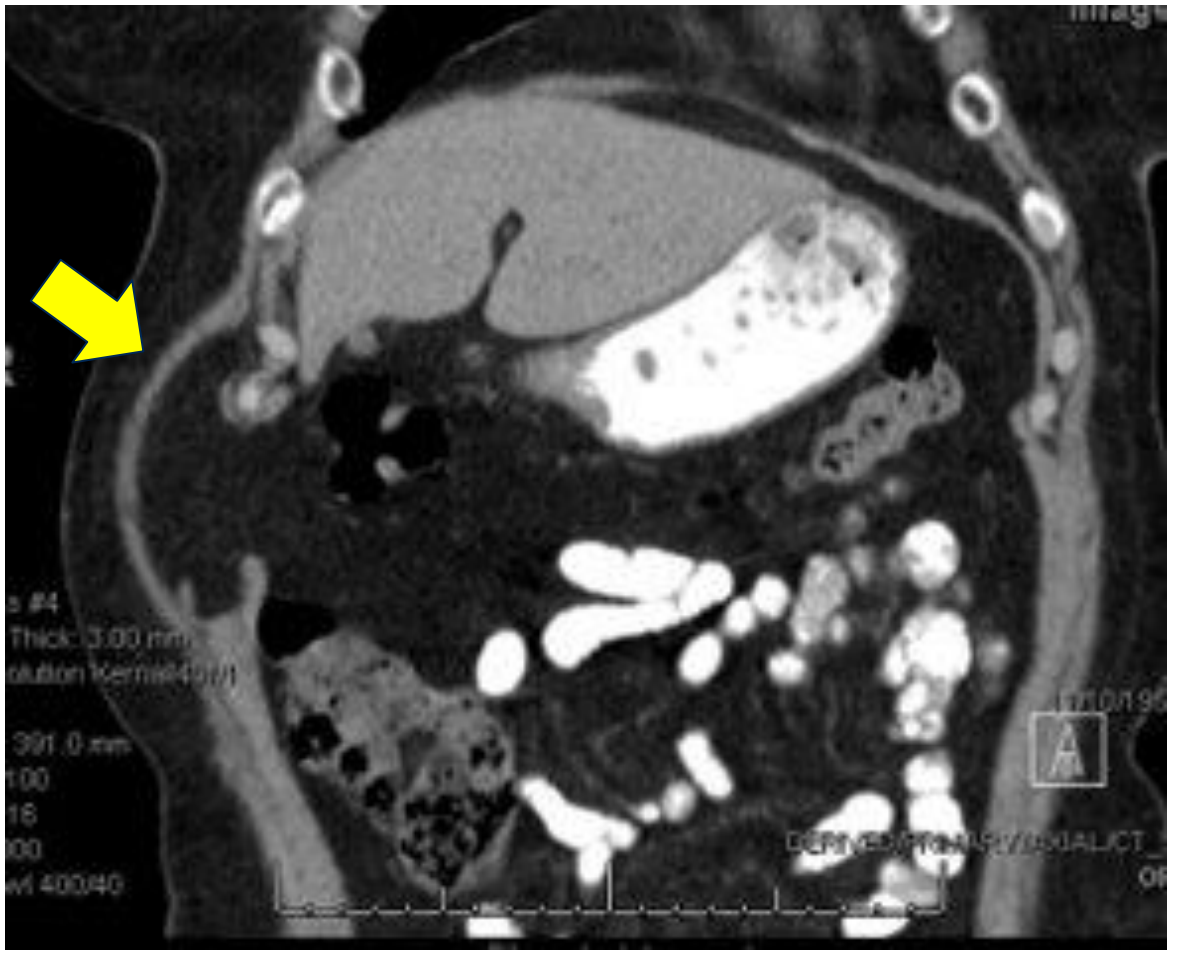
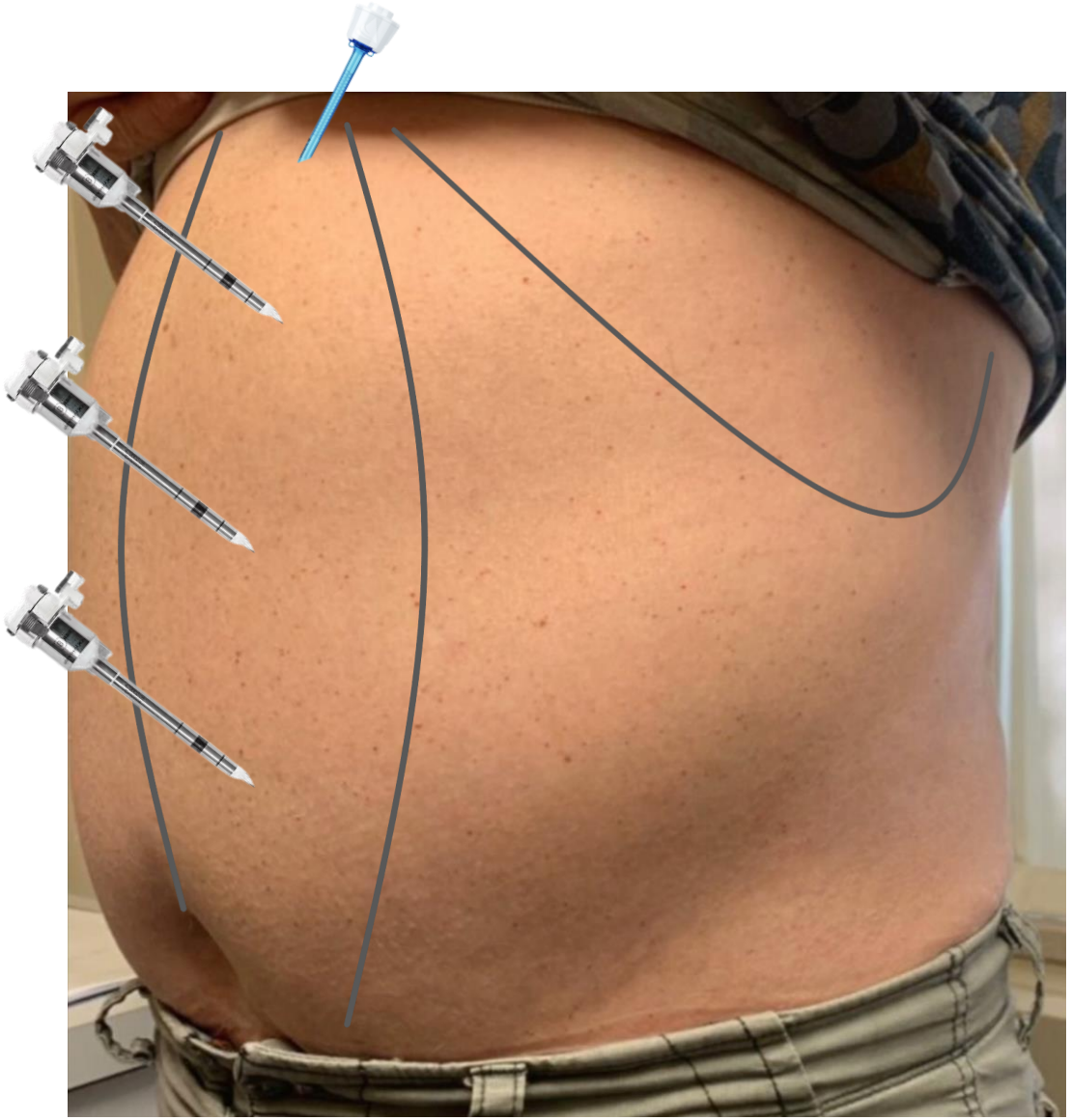
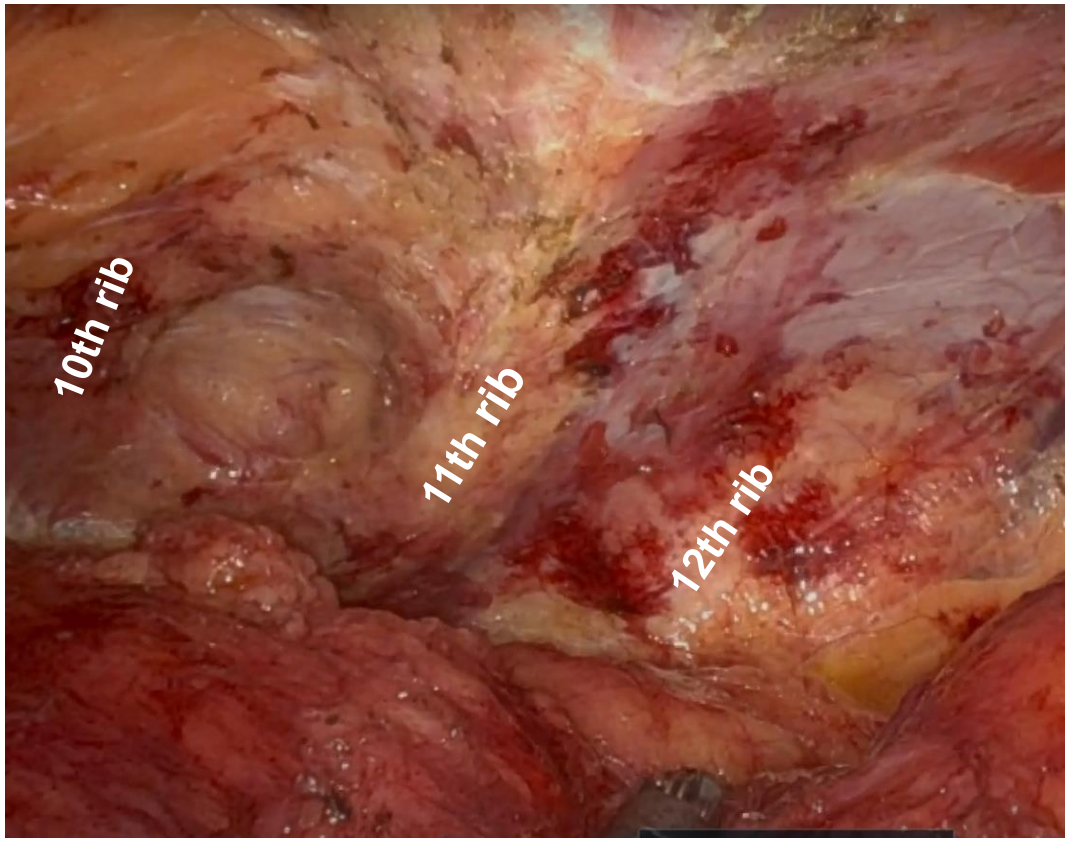




Intervention





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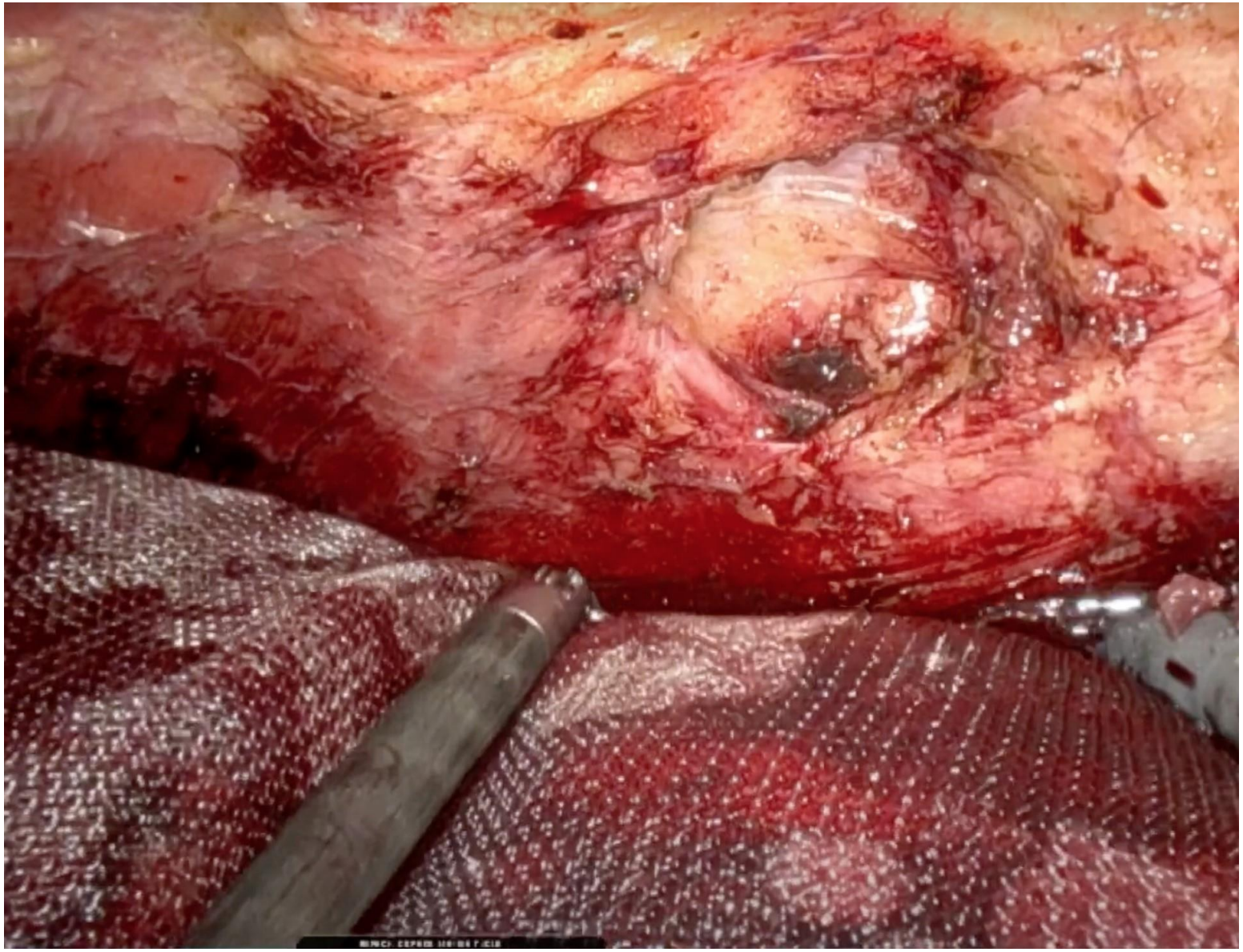

Operation

- ETEP access ipsi rectus
- TAR beyond defect
- Defect size :
- Hybrid in 3/8
- Fixation
- HWPP (Prolene PML or Bard HW)
- Primary closure if possible, PDS
- Retromuscular drain

Hernia Defect Size (cm)	Size of Mesh (cm)	Approach
18 x 25	30 x 30	Hybrid
5 x 15	36 x 26	Robotic
11 x 7	30 x 30	Robotic
15 x 35	48 x 48	Hybrid
?	30 x 24	Robotic
15 x 10	26 x 36	Robotic
10 x 13	36 x 20	Hybrid
6 x 12	25 x 25	Robotic

Post-op course

- Median length of stay – 1 day (8 days)
  - 1: POD 0
  - 6: POD 1
  - 1: POD 8

- Postop SSO/SSI
  - 1 patient had infected seroma requiring operative drainage, vac
  - Mesh salvaged

Follow-up

- 2.5-year follow-up in office
  - –8/8 follow up
    - Clinically no recurrence, stability
    - Symptomatic improvement
    - Patient satisfaction, improved QOL

Conclusion

- This case series demonstrates that Robotic-Assisted Extended Total Extraperitoneal Transversus Abdominus Release seems to be an effective method of repair for traumatically-induced abdominal intercostal hernias
- Affords large retromuscular coverage with MIS benefits

- More data is needed on this subset of unique hernias
- ACHQC data hard to abstract this particular hernia, have to keep own data

- THANK YOU TO THE QC! LOG MORE CASES!!!