What are the contributions of various retromuscular releases to tension reduction during TAR?

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Authors & Disclosures

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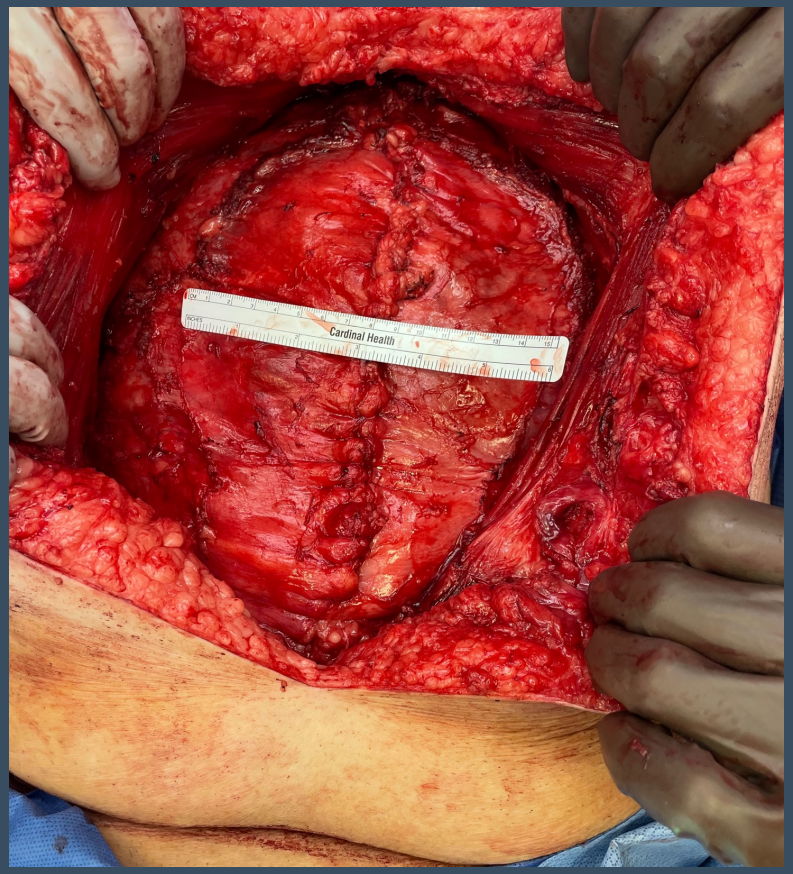
- Clayton Petro, MD: BD, consultant; Surgimatix, consultant
- Lucas Beffa, MD: Intuitive Surgical, honoraria
- David Krpata, MD: none
- Ajita Prabhu, MD: CMR Surgical Medical Advisory Board member
- Chao Tu, MS: none
- Li-Ching Huang, PhD: salary support from ACHQC
- Michael Rosen, MD: ACHQC- medical director, salary support; Ariste Medical- board member, stock options

Goals of retromuscular hernia repair

#1 Posterior fascial closure

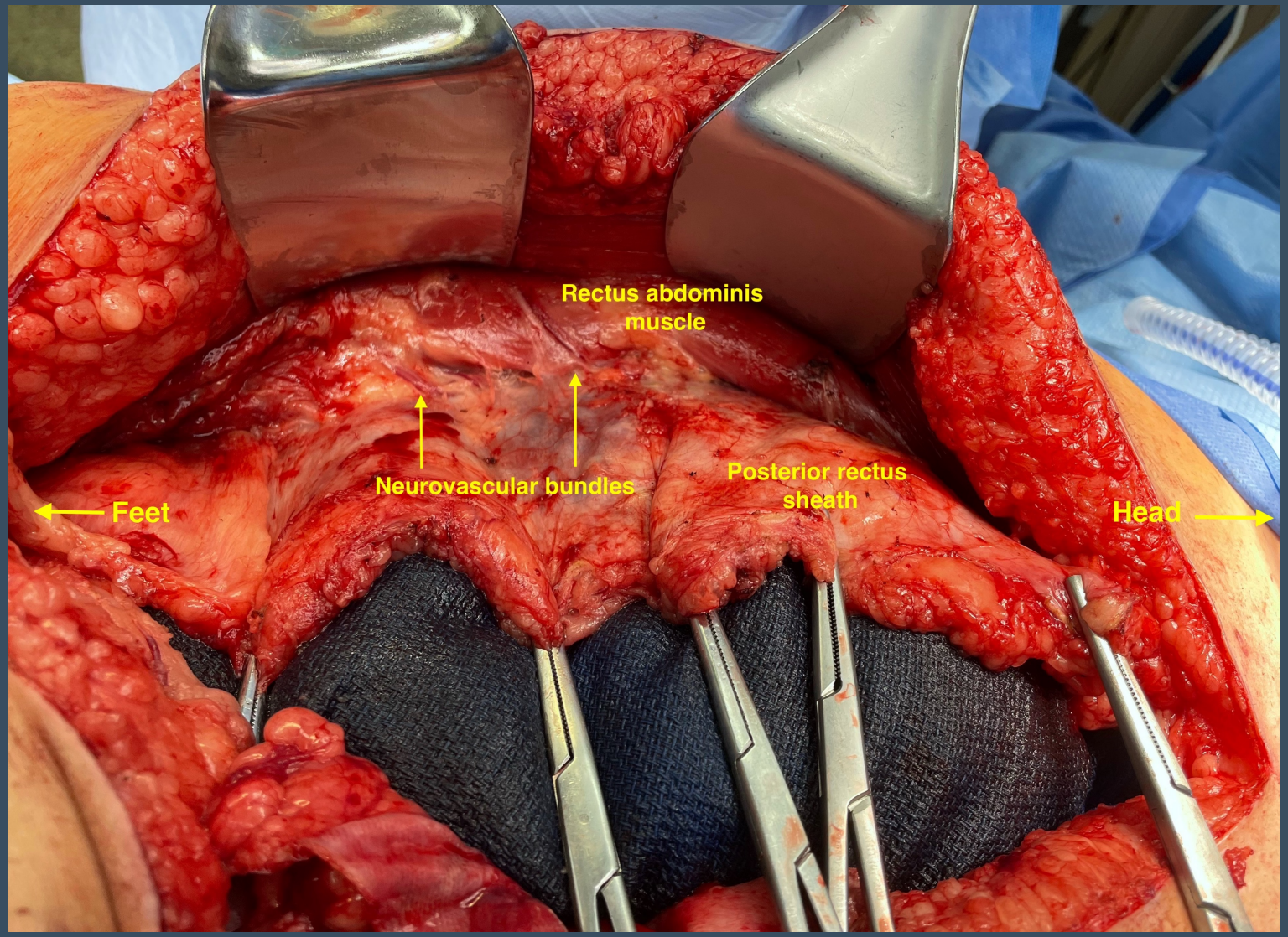


#2 Anterior fascial closure

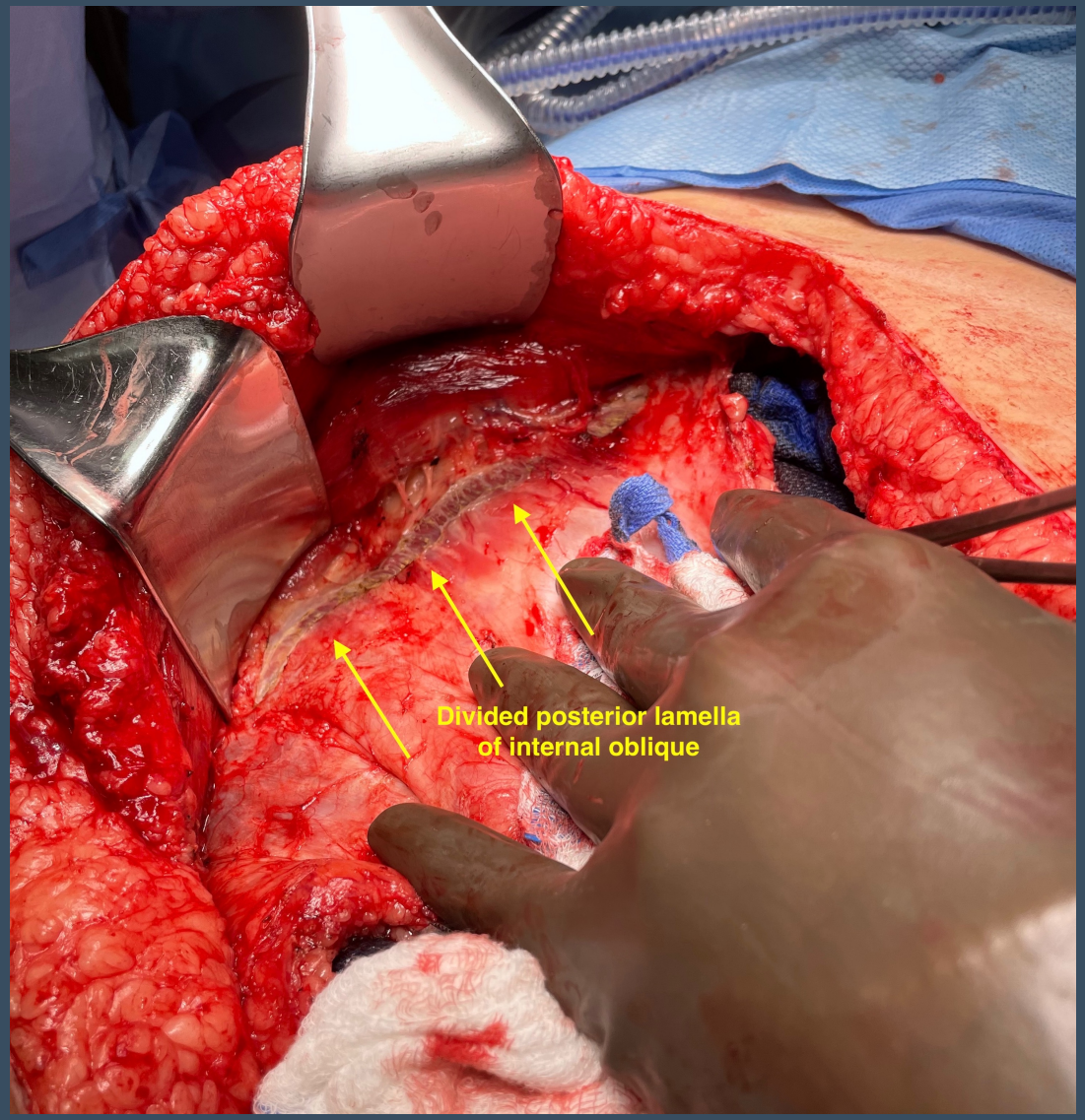
Posterior components separation (PCS)

1. Rives-Stoppa retrorectus dissection
2. Incision of the posterior lamella of the internal oblique (PLOTIO) aponeurosis
3. Transversus abdominis release (TAR) with separation of the retroperitoneum

1. Retrorectus dissection

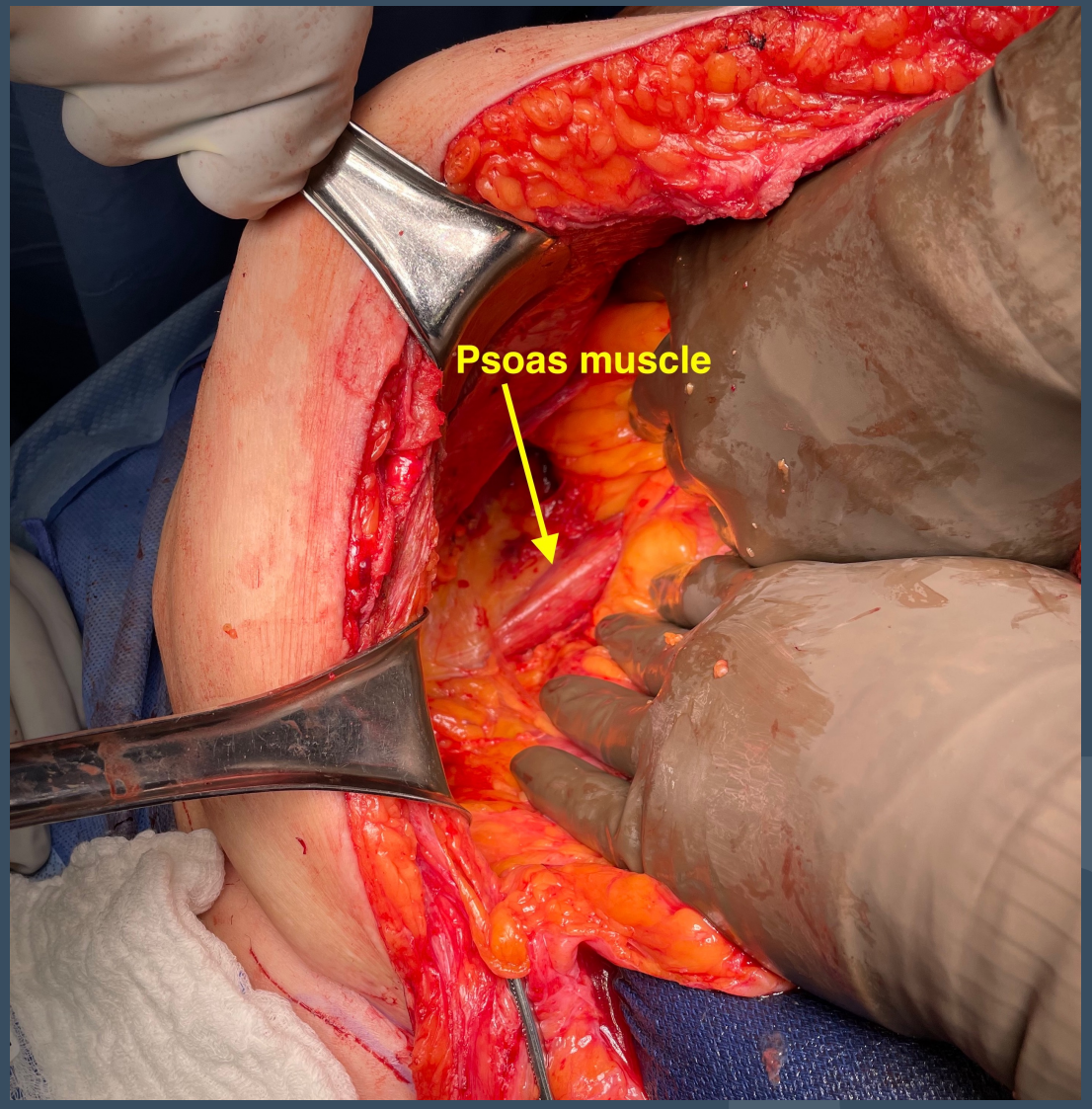


2. Division of PLOTIO

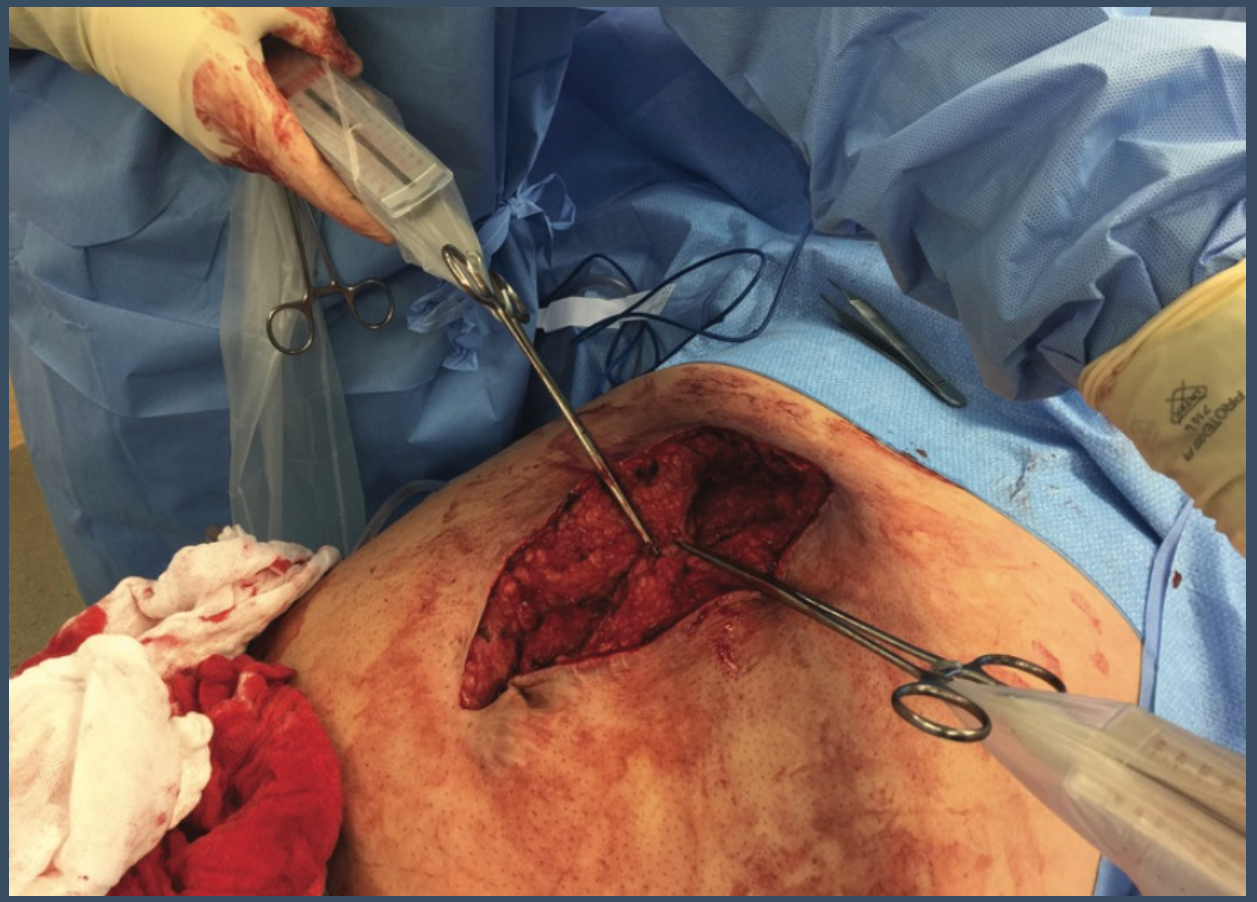


3. TAR


Divided edge of transversus abdominis muscle


Psoas muscle

What are these releases doing to abdominal wall tension?



- Retrorectus dissection
  -2.55 lbs
- TAR
  -0.66 lbs

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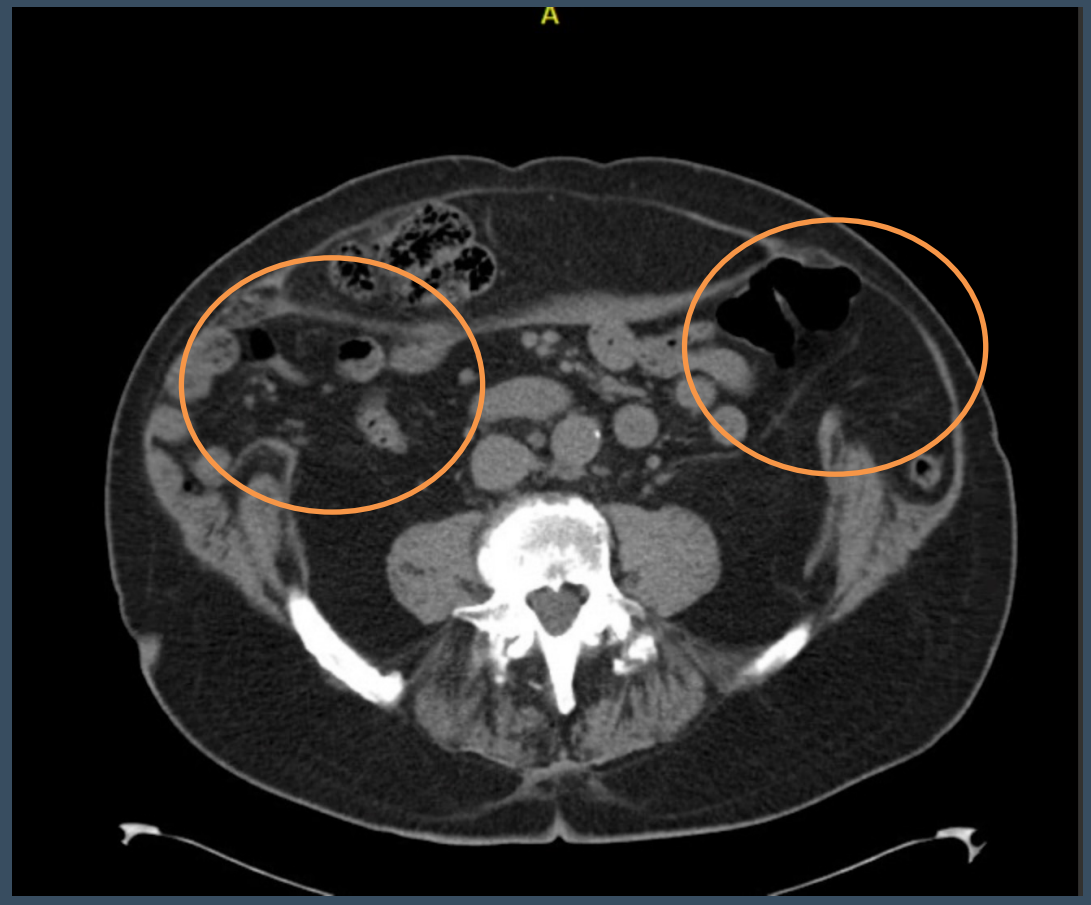
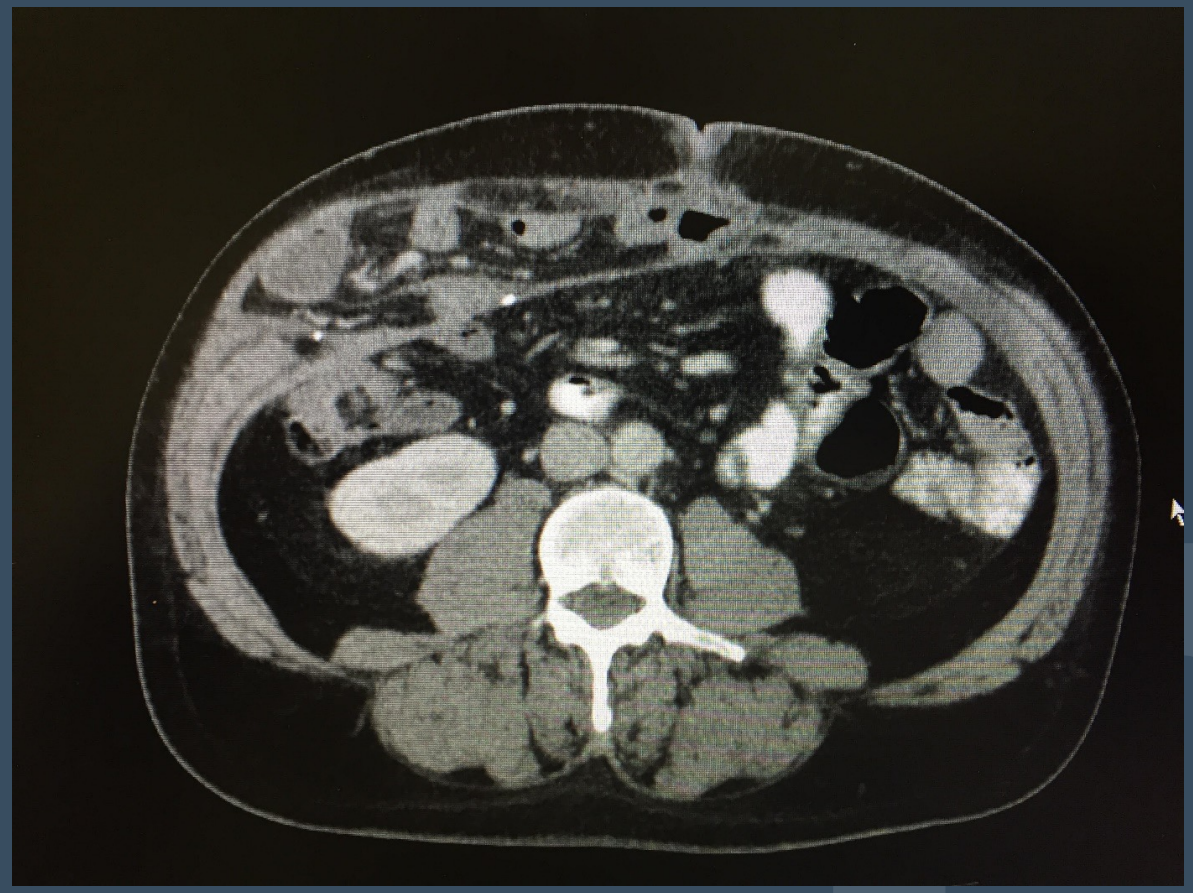
Can we tailor the repair to the patient?

Linea semilunaris injury



Posterior sheath disruption



Study aim

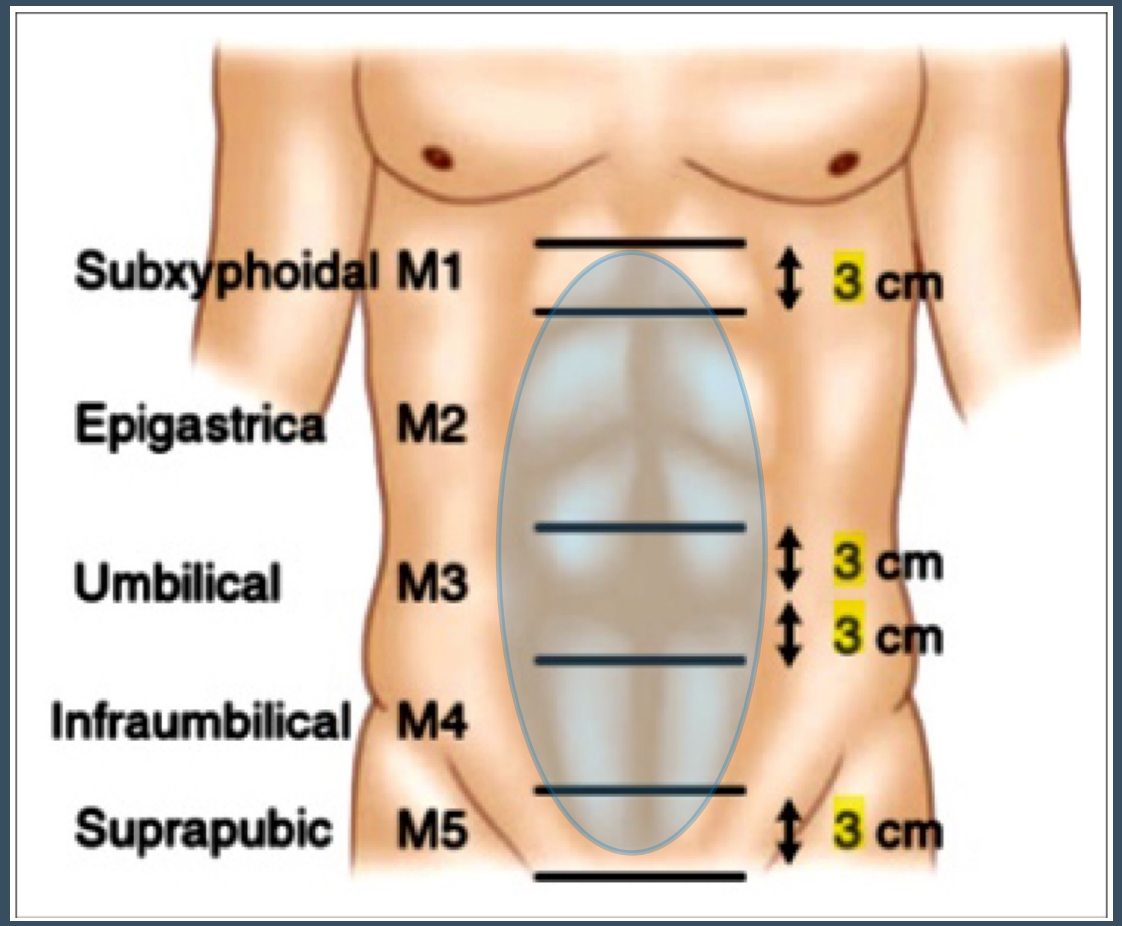
- Measure tension changes on the anterior and posterior fascia contributed by each step of PCS with TAR

Methods

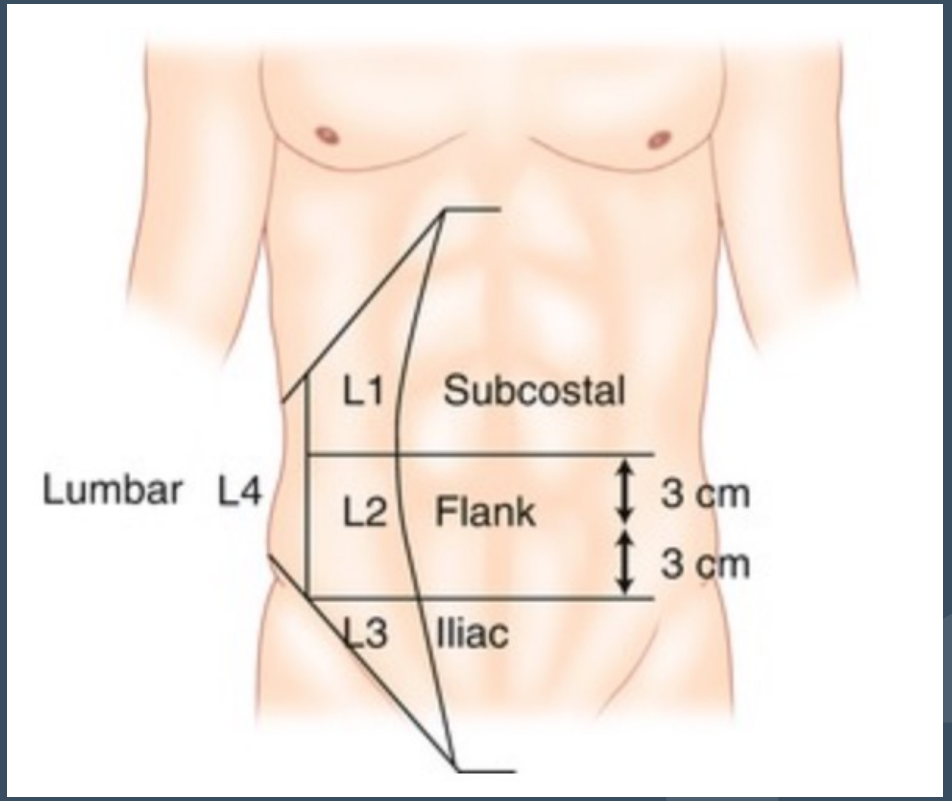
Tensiometer

Methods

Inclusion criteria:



Exclusion criteria:



Prior PCS

Observation: Tensiometry after each retromuscular release

Methods

- ACHQC registry
  - Patient characteristics
  - Operative details

Methods

Outcomes

- Primary: change in tension on the anterior and posterior fascia during PCS with TAR
- Secondary: association of abdominal wall tension with age, gender, BMI, hernia width, and prior lateral incisions

Results

Patient characteristics

	N=100
Gender (women)	48 (48%)
Age (years)	60 [54;68]
BMI	32 [29;36]
Obesity (BMI > 30kg/m^2)	68 (68%)
Hypertension	61 (61%)
Current smoker	11 (11%)
Diabetes	24 (24%)
COPD	8 (8%)
Immunosuppression	6 (6%)
Recurrent hernia	55 (55%)

Operative details

	N=100
CDC wound class	
1	81 (81%)
2	16 (16%)
3	3 (3%)
Operating room time (min)	
60-119	20 (20%)
120-179	34 (34%)
180-239	23 (23%)
240	23 (23%)

Operative details

	N=100
Hernia width (cm)	13.0 [10;15]
Hernia length (cm)	23.0 [20;25]
Mesh width (cm)	30.0 [30;40]
Mesh length (cm)	30.0 [30;37]
Enterotomy	2 (2%)
Concomitant procedure	15 (15%)
GI	11 (11%)
GYN	2 (2%)
Plastics	2 (2%)
Estimated blood loss (mL)	100 [50;150]

Abdominal wall tensiometry

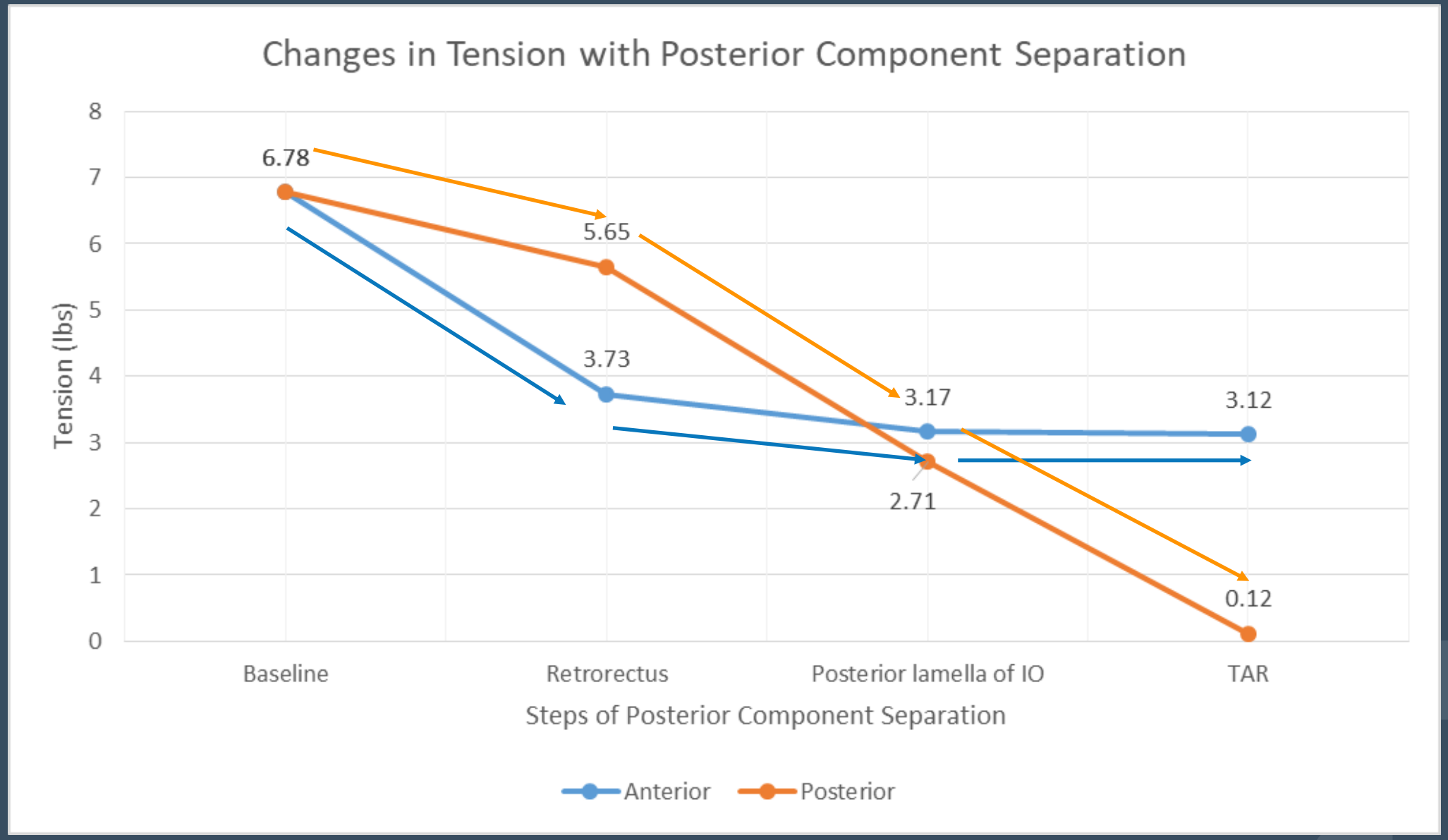
	Tension N=200	Change in tension N=200
Baseline		
Anterior and posterior (lbs)	6.78	
Retrorectus dissection		
Anterior (lbs)	3.73	-2.92
Posterior (lbs)	5.65	-1.00
PLOTIO		
Anterior (lbs)	3.17	-0.56
Posterior (lbs)	2.71	-2.94
TAR		
Anterior (lbs)	3.12	-0.05

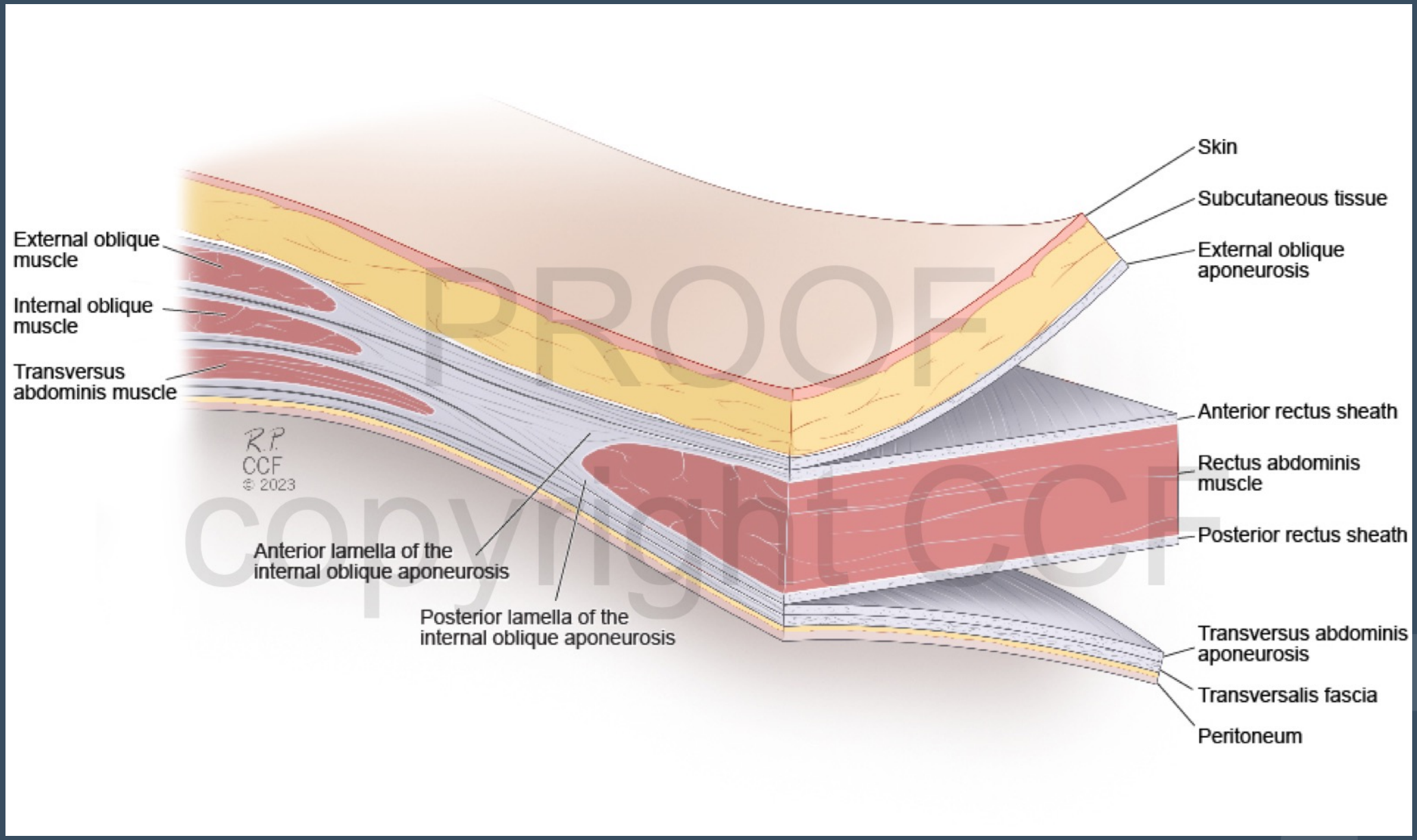
Abdominal wall tensiometry

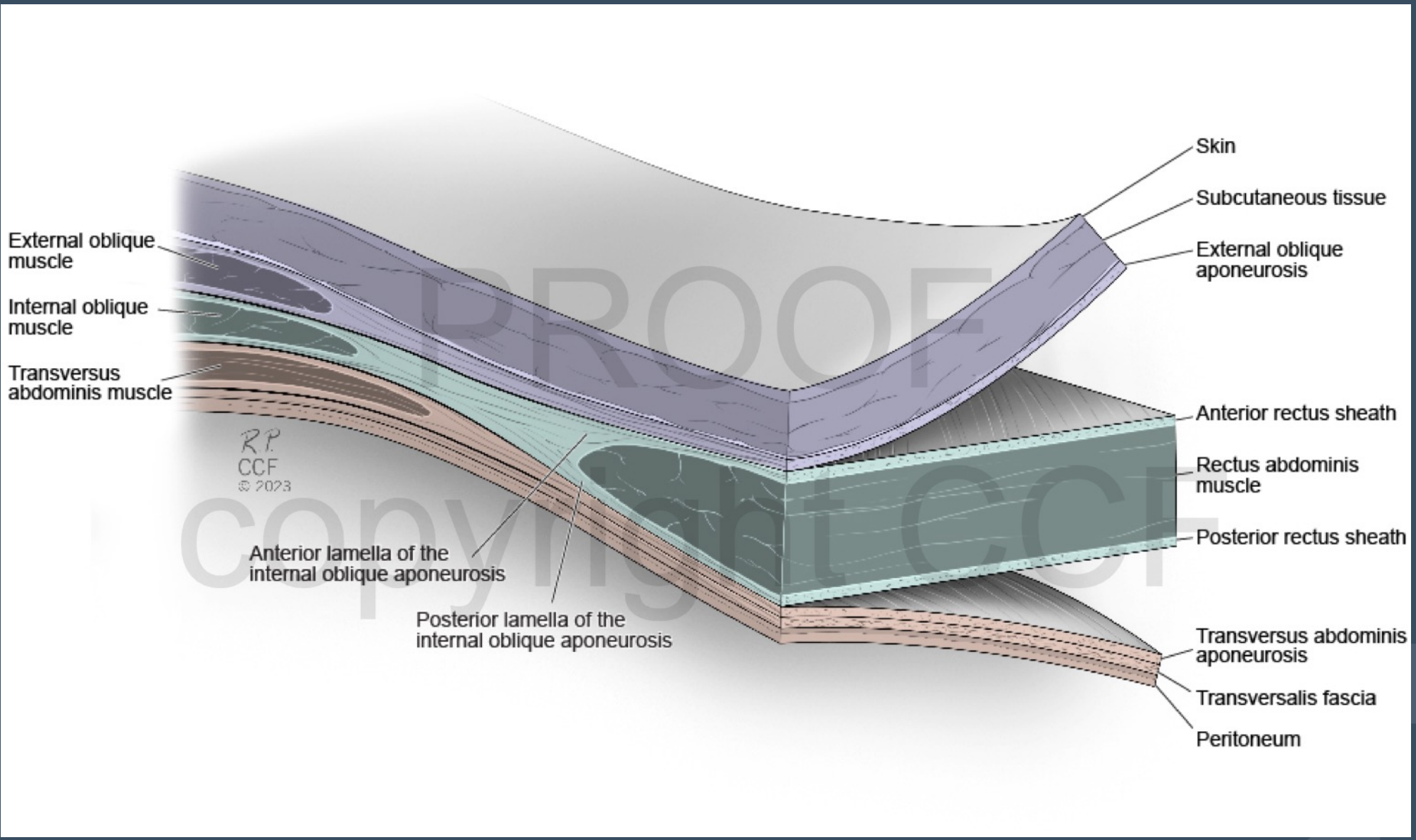
	Percent change in tension N=200	Contribution to total change N=200
Baseline		
Anterior and posterior (lbs)		
Retrorectus dissection		
Anterior (lbs)	-48%	-82%
Posterior (lbs)	-3%	-3%
PLOTIO		
Anterior (lbs)	-16%	-18%
Posterior (lbs)	-50%	-53%
TAR		
Anterior (lbs)	-3%	0%

Total changes on anterior and posterior fascia

	N=200
Anterior fascia	
Baseline tension (lbs)	6.78
Final tension (lbs)	3.12
Change in tension (lbs)	-3.53
Percent change in tension	-53%
Posterior fascia	
Baseline tension (lbs)	6.78
Final tension (lbs)	0.12
Change in tension (lbs)	-6.53
Percent change in tension	-98%


Changes in Tension with Posterior Component Separation
Tension (lbs)
8
7
6
5
4
3
2
1
0
6.78
5.65
3.73
3.17
2.71
3.12
0.12
Baseline
Retrorectus
Posterior lamella of IO
TAR
Steps of Posterior Component Separation
Anterior
Posterior





Regression model of changes in abdominal wall tension on covariates

	Coefficient	SE	95% CI	P value
(Intercept)	-0.20	1.93	(-3.99, 3.58)	0.92
Age	-0.02	0.02	(-0.06, 0.02)	0.29
Gender (male)	0.29	0.44	(-0.58, 1.15)	0.52
BMI	0.006	0.05	(-0.09, 0.10)	0.90
Hernia width	-0.11	0.05	(-0.21, -0.009)	0.03

Key Takeaways

- For anterior fascial advancement:
  - Retrorectus dissection
  - Divide PLOTIO (minimal)
- For posterior fascial advancement:
  - Divide PLOTIO
  - TAR with separation of retroperitoneum

Don't do a TAR to advance the anterior fascia!


4:08

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