

Evaluation of Tension Measurements During Retromuscular Incisional Hernia Repair

Rajavi S. Parikh, DO PGY IV
New Hanover Regional Medical Center
PI: William Hope, MD



Disclosures

- I have no potential or actual conflicts of interest to disclose
- Dr. Hope's Disclosures:
 - CR Bard/Davol: consulting, speaking, research
 - WL Gore: speaking, research
 - Intuitive: speaking

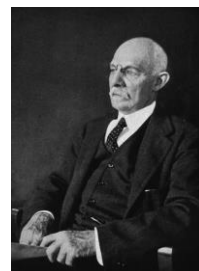


Tension



Halsted's Principles

- Gentle handling of tissue
- Meticulous hemostasis
- Preservation of blood supply
- Strict aseptic technique
- Accurate tissue apposition
- Obliteration of deadspace
- Minimum tension on tissues**



Search results
Items: 1 to 20 of 250

[Tension-free open mesh repair of ventral hernias--Stoppa's technique.](#)
Sidhu BS, Sharma RK.
Int Surg. 2001 Oct-Dec;86(4):229-34.
PMID: 12056467

[Tension-free repair of giant ventral hernias.](#)
Pate LM, White JE, Somberg LB, Barker J.
J Tenn Med Assoc. 1995 Jan;88(1):20-1. No abstract available.
PMID: 7837800

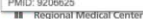
[Taking the tension out of hernia repair.](#)
Stuart AE.
Lancet. 1994 Mar 26;343(8900):748. No abstract available.

[Early open mesh repair for inguinal hernia repair.](#)

[A secure method of repair of large ventral hernias with Marlex mesh to eliminate tension.](#)
Deitel M, Vasic V.
Am J Surg. 1979 Feb;137(2):276-7.
PMID: 371427

[Surgical repair of incisional ventral hernias: tension-free technique using expanded polytetrafluoroethylene \(Gore-Tex Dual Mesh\).](#)
Chrysos E, Athanasakis E, Saridaki Z, Kafetzakis A, Dimitriadou D, Koi Xynos E, Zoras O.
Am Surg. 2000 Jul;66(7):679-82.

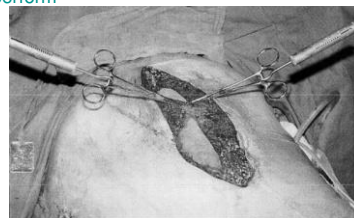
[Tension-free suture of incisional hernia.](#)
Farthmann EH, Mappes HJ.
Chirurg. 1997 Apr;88(4):310-6. Review. German.
PMID: 9208625



Incisional Hernia Repair: Tensiometry for the Selection of the Appropriate Procedure

Bertram Reingruber, Sigrid Kastl, Christian Stremmel and Peter D. Klein
From the University Department of Surgery, Erlangen, at the Friedrich-Alexander-University, Erlangen-Nürnberg, Germany

- Used tension measurements to determine which type of repair to perform



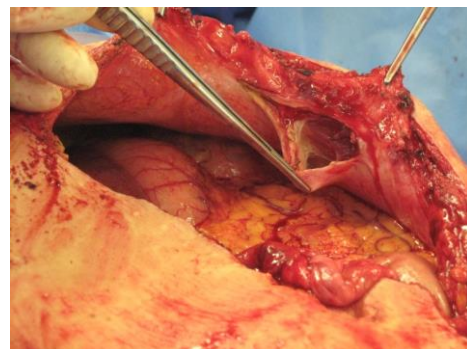
Question: If and what tension benefit does a retromuscular repair provide?



Methods



- Prospective trial
 - Patients undergoing open ventral hernia repair
 - Data collected over the past 5 years
 - Procedure performed
 - Data analysis performed





New Hanover Regional Medical Center

Statistical Analysis

- Measurements pre retrorectus dissection and post dissection were compared
- Paired sample t-test
- Sign ranked t-test
- p-value: <0.05 considered significant

New Hanover Regional Medical Center

Results

- 45 patients
 - Average age of 58 (29-81)
 - Caucasian: 78%
 - Female 51%
 - Average BMI: 35 (20-62)
 - Recurrent hernias: 38%
- Defect size average of 121.9 cm²
- Mesh size 607.8 cm²
- Decrease in tension from 5.6 vs 3.1 lbs (p<0.0001)

New Hanover Regional Medical Center

Results

- 45 patients
 - Average age of 58 (29-81)
 - Caucasian: 78%
 - Female 51%
 - Average BMI: 35 (20-62)
 - Recurrent hernias: 38%
- Defect size average of 121.9 cm²
- Mesh size 607.8 cm²
- **Decrease in tension from 5.6 vs 3.1 lbs (p<0.0001)**

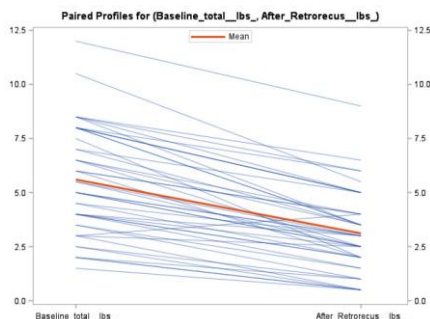
New Hanover Regional Medical Center

Paired sample t-test example

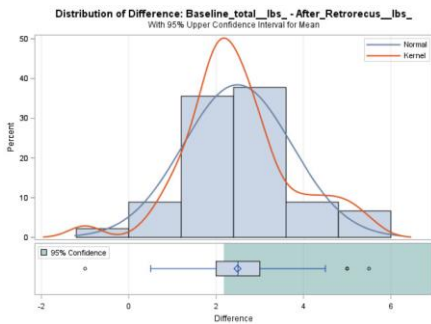
The UNIVARIATE Procedure
Variable: diff

Moments			
N	45	Sum Weights	45
Mean	2.4888889	Sum Observations	112
Std Deviation	1.24539556	Variance	1.5510101
Skewness	0.22963887	Kurtosis	1.02171047
Uncorrected SS	347	Corrected SS	68.2444444
Coeff Variation	50.0382145	Std Error Mean	0.18565261

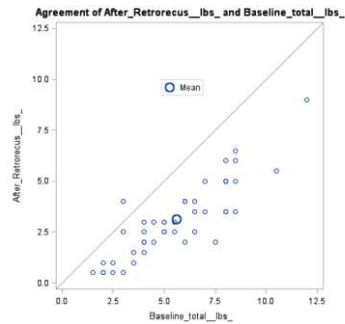
New Hanover Regional Medical Center



New Hanover Regional Medical Center



New Hanover
Regional Medical Center



New Hanover
Regional Medical Center

Future Directions

- How do these patients do long term at different tension levels?
- What tension changes do we see with other types of repairs?
- What tension is considered physiologic?

New Hanover
Regional Medical Center

In Closing

- Tension is significantly reduced by release of the posterior rectus sheath
- Further studies should be performed to show what level of benefit is achieved at what level of tension



New Hanover
Regional Medical Center

