

# OPEN ABDOMINAL WALL RECONSTRUCTION: WHAT HAVE WE LEARNED?

John M. Clarke, MD | St. Petersburg, Florida | jclarke2@tampabay.rr.com

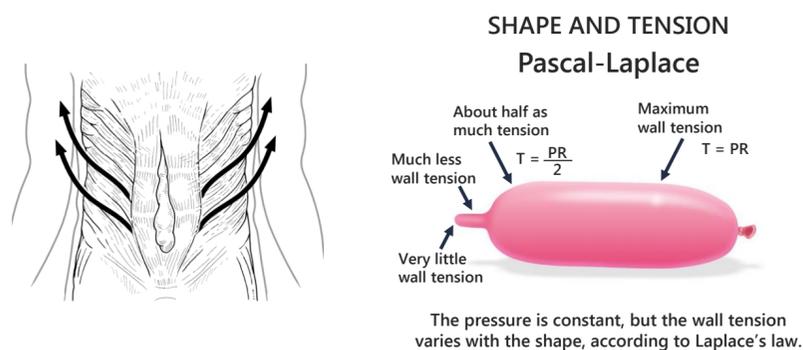
## MAGNITUDE OF THE PROBLEM

The CDC and National Survey of Ambulatory Surgery reported the following incisional hernia statistics (per year, as of 2006):

- >2million laparotomies
- 19% calculated recurrence
- 384,000 total VH repairs
- \$32 million calculated cost savings of 1% decrease
- \$3.2 billion total cost

## ANATOMY & PHYSIOLOGY

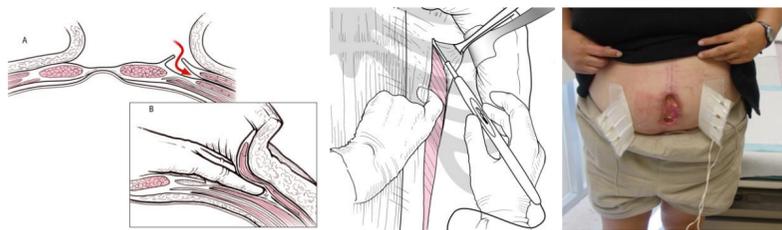
The midline is the insertion point for the left and right abdominal muscular units. Detachment results in lateral retraction. Abdominal tension is greatest where the radius is longest (Laplace). This explains why a simple inlay is successful for TEP/TAPP inguinal hernia repair but not for midline ventral defects.



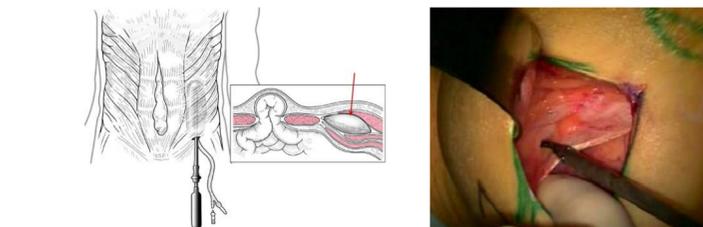
## EVOLUTION & COMPARISON OF TECHNIQUES

1. Mesh inlay, overlay, gap bridging – largely abandoned because of poor results.
2. Anterior fascial component separation: classical and perforator sparing techniques – a comparison:

### CLASSICAL TECHNIQUE – WIDE SKIN FLAPS

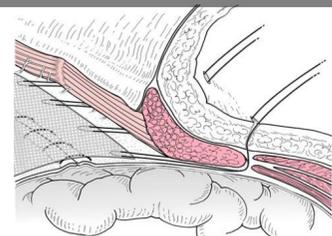


### PERFORATOR SPARING TECHNIQUE – INGUINAL APPROACH



	TECHNIQUE	FAILURE	SKIN NECROSIS
	Classic skin flaps	6/63 9.5%	<b>13/63</b> <b>20%</b>
	Perforator preservation	6/67 8.9%	<b>0/67</b> <b>0%</b>

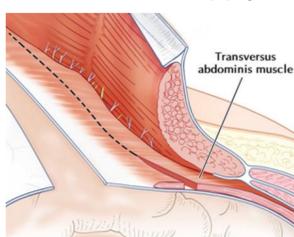
## CURRENT STATE OF THE ART



**Rives Retromuscular Mesh:** This "French" operation and its extended variant are the current state of the art.

**Extended Retromuscular Repair, Lateral Transversus Release:** Special technique for opening the retroperitoneal space lateral to the rectus, for advanced or complex defects.

1. Creates component separation at the deep level.
2. More technically challenging.
3. Requires a second incision of the posterior sheath, and neurovascular supply to the rectus must be preserved.



## PREVENTION OF INCISIONAL HERNIA

Technique is the only variable surgeons can control. Although "mass closure" has been the standard of the modern era, a Swedish study, now duplicated in a European multicenter trial (Dr. Leif Israelsson – personal communication), strongly suggests that a "small stitch" fascial closure produces a significantly lower incidence of herniation.

737 patients with midline closure were randomized. Suture to incision length was maintained at 4:1 for both groups. Group 1 had suture width of 5-8 mm (short width) and Group 2 had >10 mm (long width). The population was reviewed for end points of infection and hernia.

### STUDY RESULTS

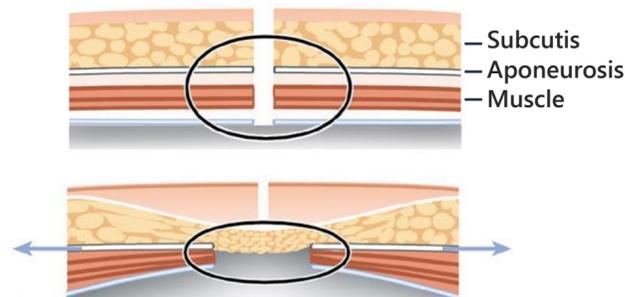
There were only 1/3 as many hernias with the narrow suture width technique, and only 1/2 as many infections.

Technique (4:1 maintained for all)	Infection	Hernia
Wide Stitch Length	<b>10.2%</b>	<b>18%</b>
Narrow Stitch Length	<b>5.2%</b>	<b>5.6%</b>

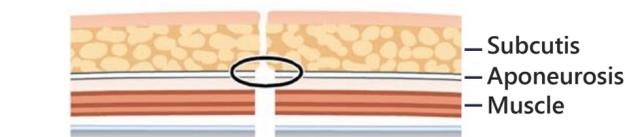
### HYPOTHESIS

Mass closure may provide a secure closure early, but the tissues enclosed in the wide suture eventually become necrotic and permit the midline fascial edges to separate, thus setting the stage for herniation.

### WHAT HAPPENS WITH "MASS CLOSURE"



### ONLY CLOSING THE MIDLINE APONEUROSIS



### "FASCIAL ONLY" NARROW STITCH CLOSURE



The "fascial only" closure with narrow stitch width, close enough together to produce the 4:1 suture-to-incision ratio.

**(For a link to Dr. Israelsson's video, please email me.)**

## CONCLUSIONS & RECOMMENDATIONS

1. Lateral anterior fascial component separation with primary midline reconstruction is suitable only for smaller defects and always with perforator sparing techniques.
2. Rives retromuscular mesh with or without transversus muscle release has proved to be the current state of the art.
3. For prevention of incisional hernia, the surgical community may consider replacing "mass closure" with "narrow suture width-fascial only" reconstruction. (I personally add internal retention support where indicated.)

## REFERENCES

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2. National Survey of Ambulatory Surgery (2006) National Center for Health Statistics Hyattsville, MD: US Department of Health and Human Services, Centers for Disease Control and Prevention.
3. Clarke, J. Incisional hernia repair by fascial component separation: Results in 128 cases and evolution of technique. *Am J Surg* 2010, 200:1-7.
4. Millbourn D, Cengiz Y, Israelsson L. Effect of stitch length on wound complications after closure of midline incisions: a randomized control trial. *Arch Surg*. 2009;144(11):1056-1059.