

XIII<sup>e</sup> Symposium sur les prothèses pariétales  
Paris, 16 juin 2017

# Meshes in contaminated fields

## Endoscopically assisted components separation technique (ECST)

Johannes Wegdam Thuis (Helmond, Pays-Bas)

Tammo de Vries Reilingh (Helmond, Pays-Bas)



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# Disclosure

(potentieel) conflict of interest
<ul style="list-style-type: none"><li>• Bard-Davol Inc. TEP en ECST workshop Elkerliek Hospital Helmond</li></ul>



# Meshes in contaminated fields

Grade 1	Grade 2	Grade 3	Grade 4
<b><i>Low Risk</i></b> <ul style="list-style-type: none"><li>• Low risk of complications</li><li>• No history of wound infection</li></ul>	<b><i>Comorbid</i></b> <ul style="list-style-type: none"><li>• Smoker</li><li>• Obese</li><li>• Diabetic</li><li>• Immunosuppressed</li><li>• COPD</li></ul>	<b><i>Contaminated</i></b> <ul style="list-style-type: none"><li>• Previous wound infection</li><li>• Stoma present</li><li>• Violation of GI tract</li></ul>	<b><i>Infected</i></b> <ul style="list-style-type: none"><li>• Infected mesh</li><li>• Septic dehiscence</li></ul>





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# Meshes in contaminated fields

		studies	Grade 3/4	REC	FU	SSO	ECF
Itani (RICH)	2012 (BIO-strattice)		41/80	28%	24	66%	3%
Zerbib (Lille)	2013 (BIO-strattice)		14	43%	13	57%	0
Rosen (COBRA)	2017 (BIO-Gore-Bio-A)		53/104	17%	24	28%	3%

Bridging or IPOM = REC ↑



# Meshes in contaminated fields

		studies	Grade 3/4	REC	FU	SSO	ECF
Hodgkinson	2017 Review	16	601	24% SR, SYN, BIO, ABS	37	46% SR, SYN, ABS, BIO	10%
Itani (RICH)	2012 (BIO-strattice)		41/80	28%	24	66%	3%
Zerbib (Lille)	2013 (BIO-strattice)		14	43%	13	57%	0
Rosen (COBRA)	2017 (BIO-Gore-Bio-A)		53/104	17%	24	28%	3%

Bridging or IPOM = REC ↑



# Meshes in contaminated fields

## BURNING OUT

« DANS LE VENTRE DE L'HÔPITAL »

A FILM BY  
JÉRÔME LE MAIRE

INSPIRED BY THE BOOK « GLOBAL BURN-OUT » WRITTEN BY PASCAL CHABOT  
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Endoscopically assisted components separation technique (ECST)



Endoscopically assisted components separation technique (ECST)





Endoscopically assisted components separation technique (ECST)



Endoscopically assisted components separation technique (ECST)

# Hernia Referral Center

- 2012
- Volume = Quality
- Definitions
- Regional agreement
- Business case

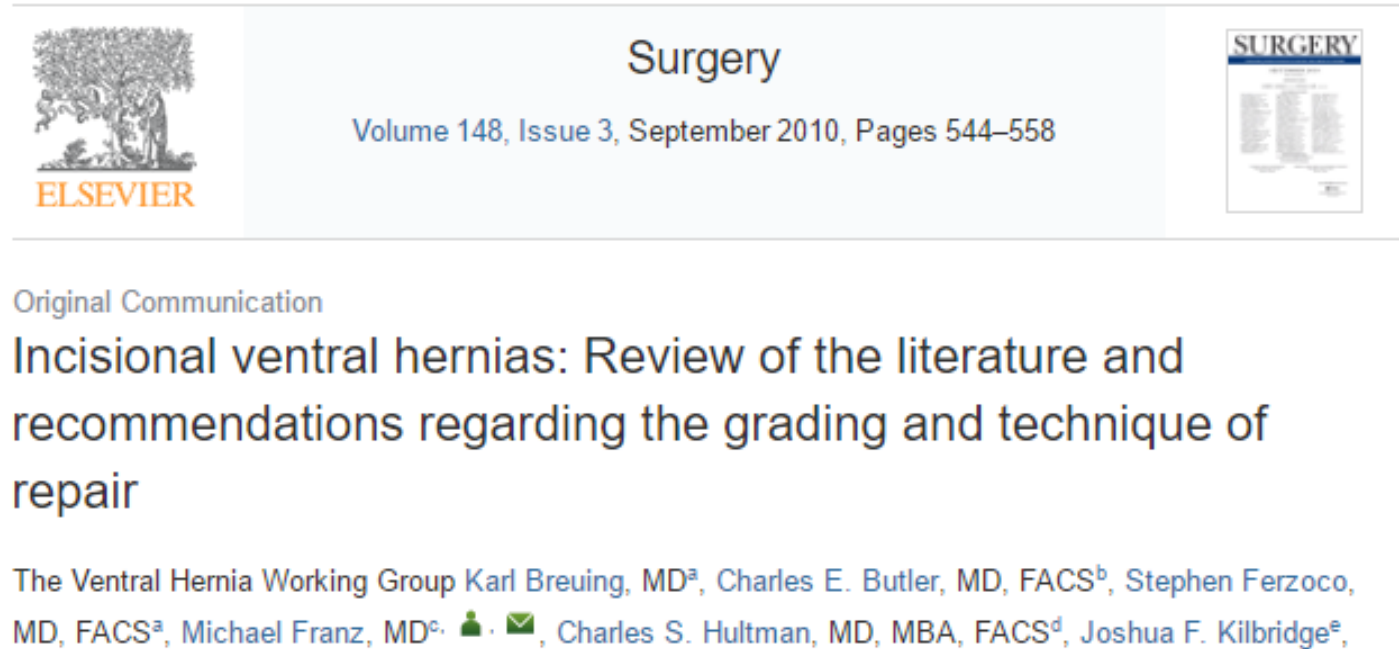




# Hernia Referral Center

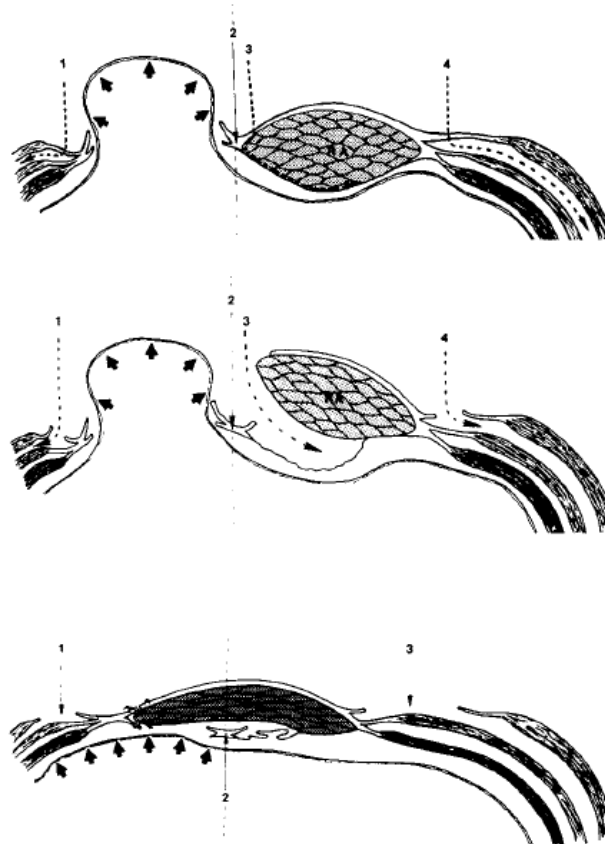
## Principles CAWR

- Rectus to rectus
- Mesh augmentation
- Component separation





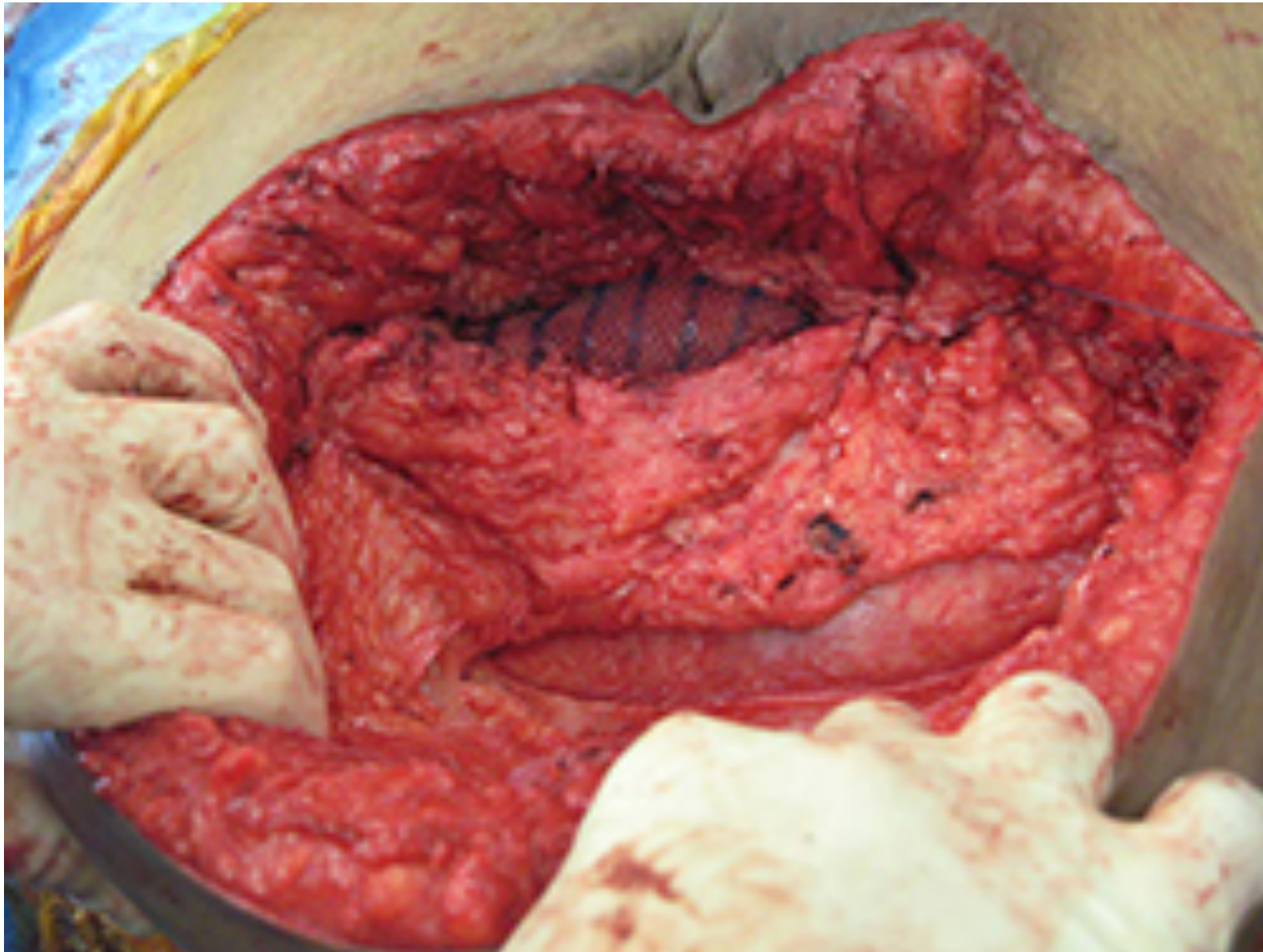
Endoscopically assisted components separation technique (ECST)



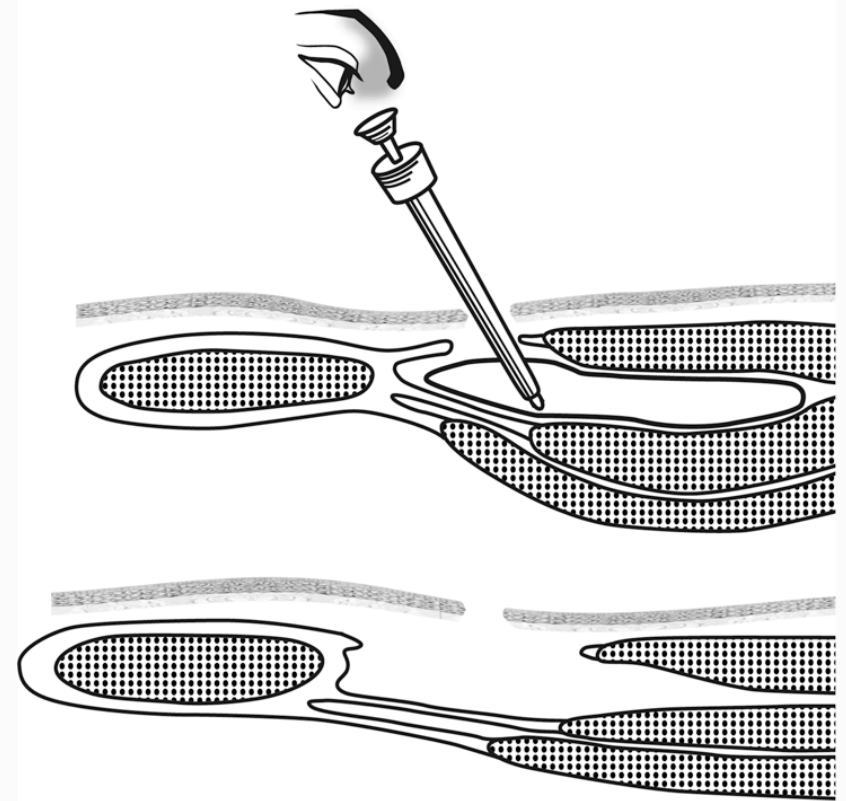
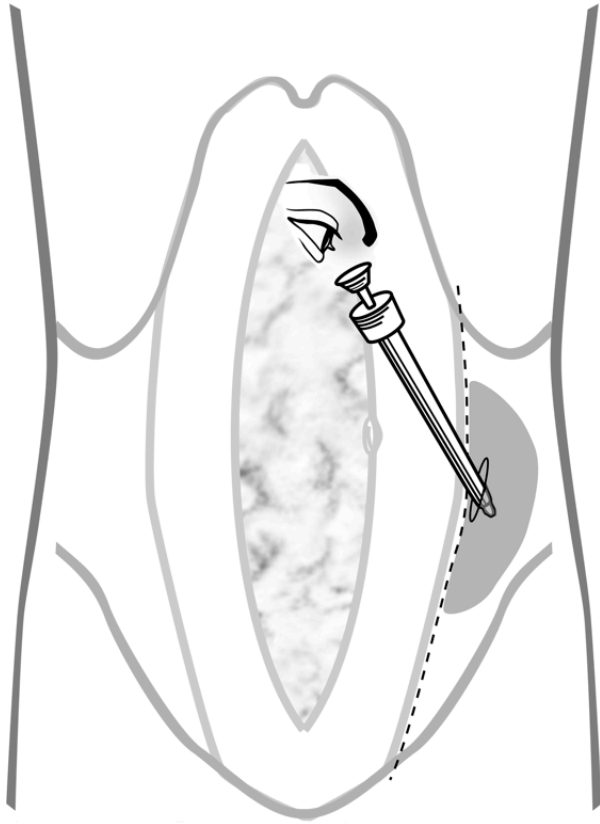
1990 “Components Separation” Method for Closure of Abdominal-Wall Defects: An Anatomic and Clinical Study

Oscar M. Ramirez, M.D., Ernesto Ruas, M.D., and A. Lee Dellon, M.D.  
*Baltimore, Md.*

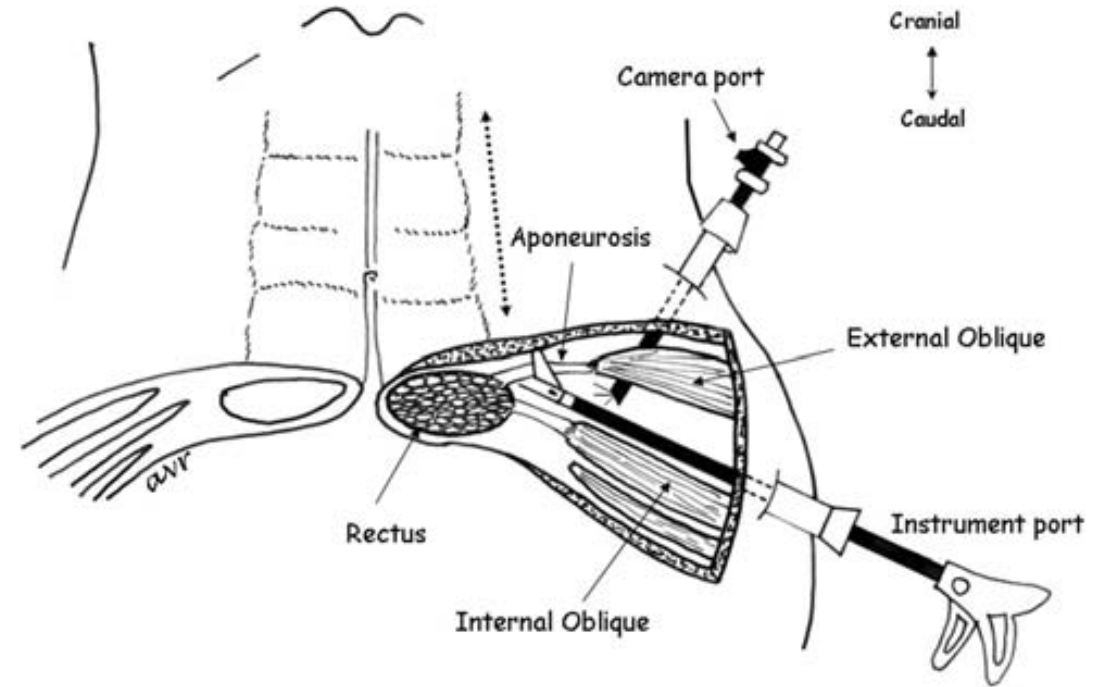
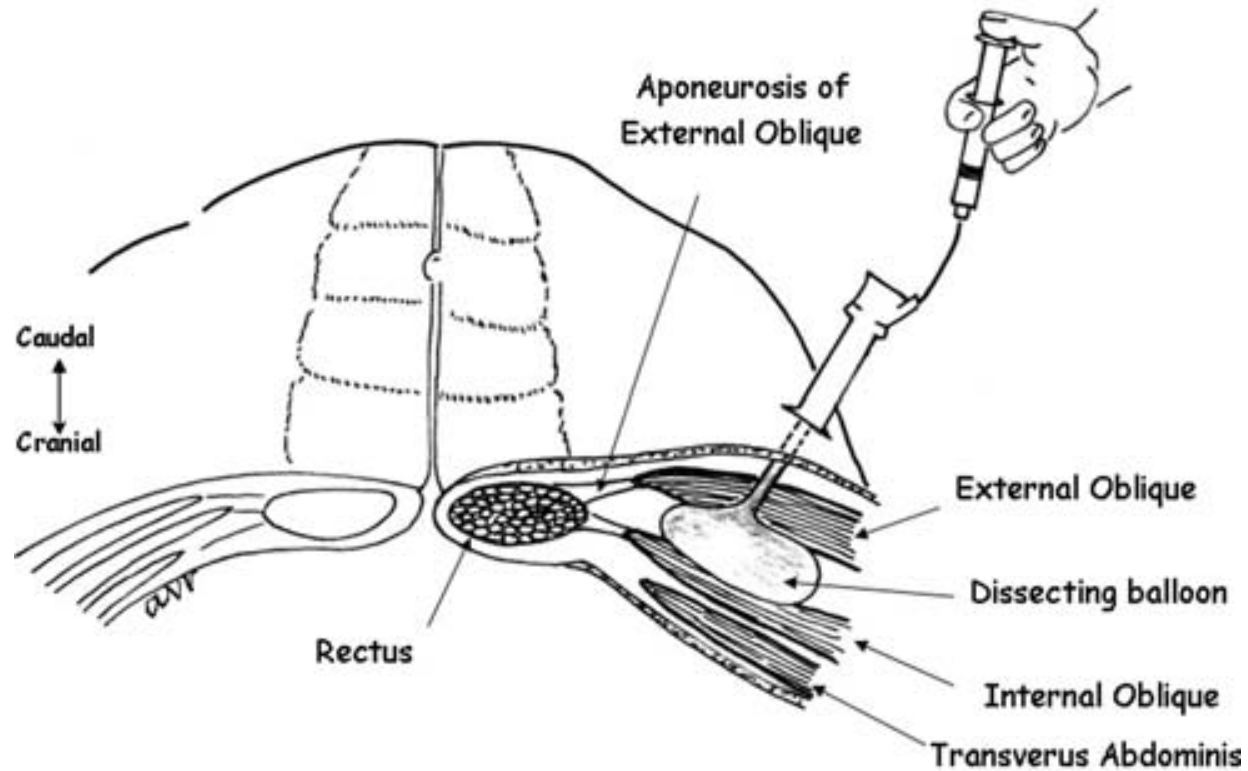




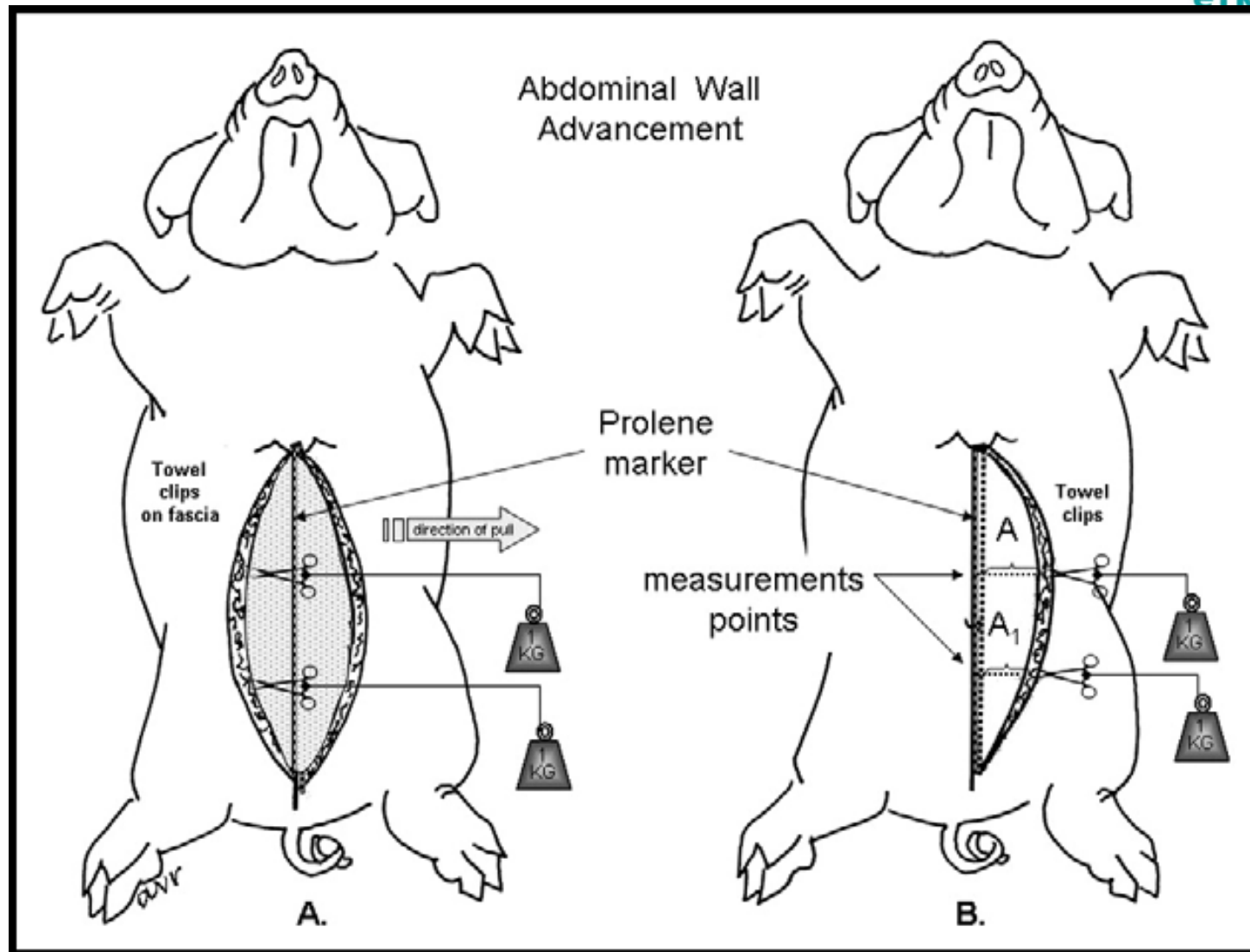




2000 Lowe, Plastic Recon Surg  
2002 Maas, TS de Vries Reilingh, JACS



2007, Rosen, Hernia



## ECST versus CST - Systematic Reviews

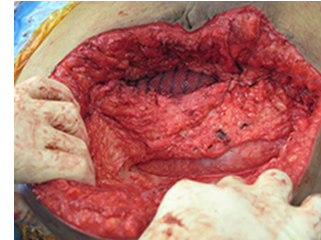
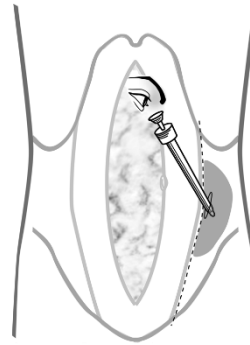
		studies	n
Jensen	2014	5	163
Switzer	2015	7	185
Feretis	2015	13	220

ECST > CST (SSO's)

% mesh? type of mesh? Location of the mesh?



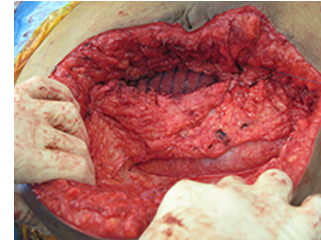
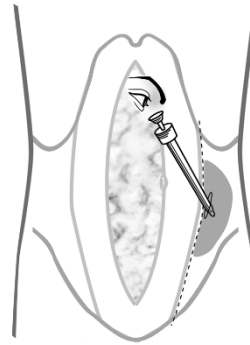
## ECST versus CST - Systematic Reviews



	ECST	CST
SSO	18%	43%
SSI	6%	13%
Recurrence	13%	16%
LoS	5-8	5-11 days

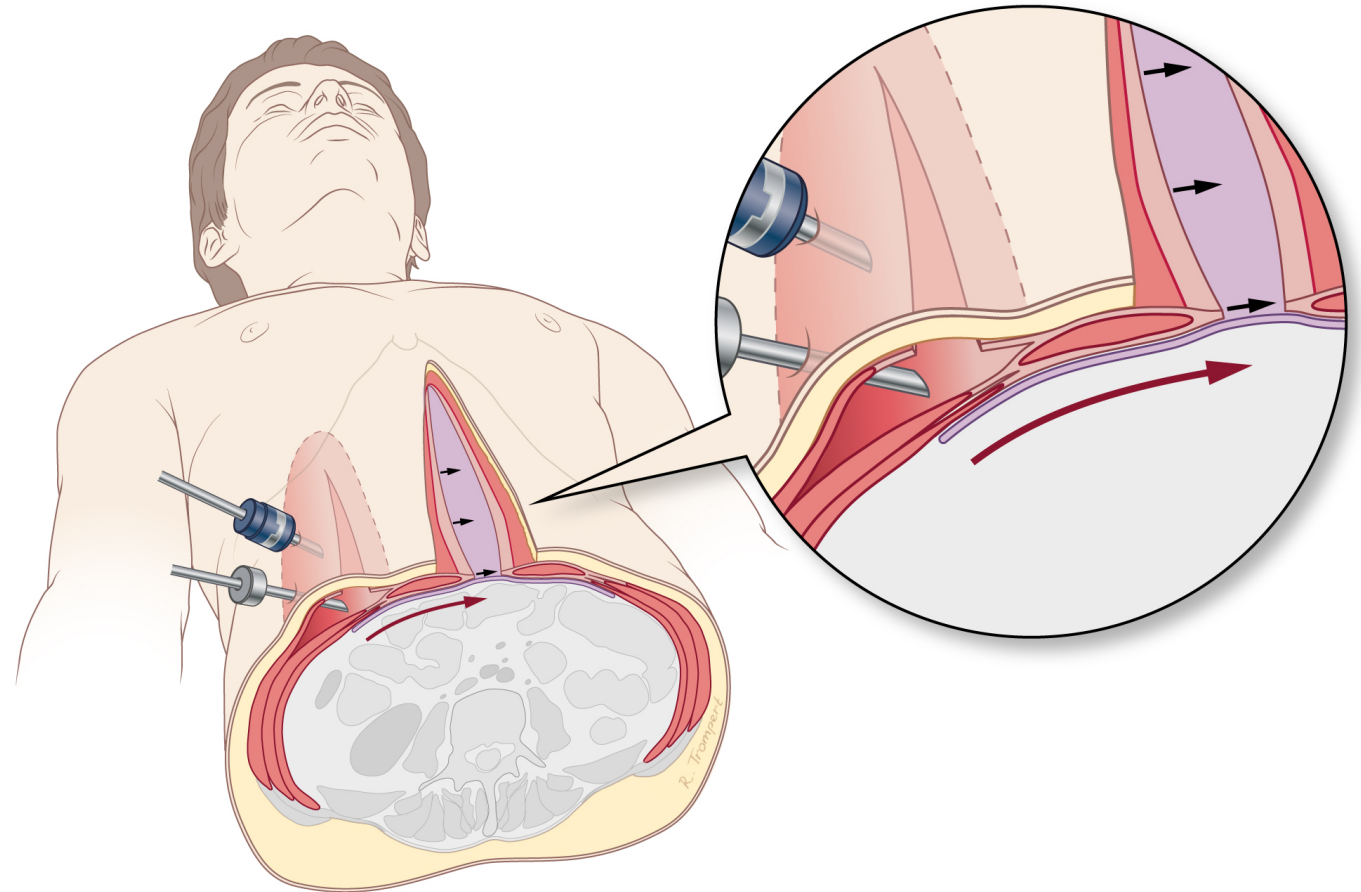
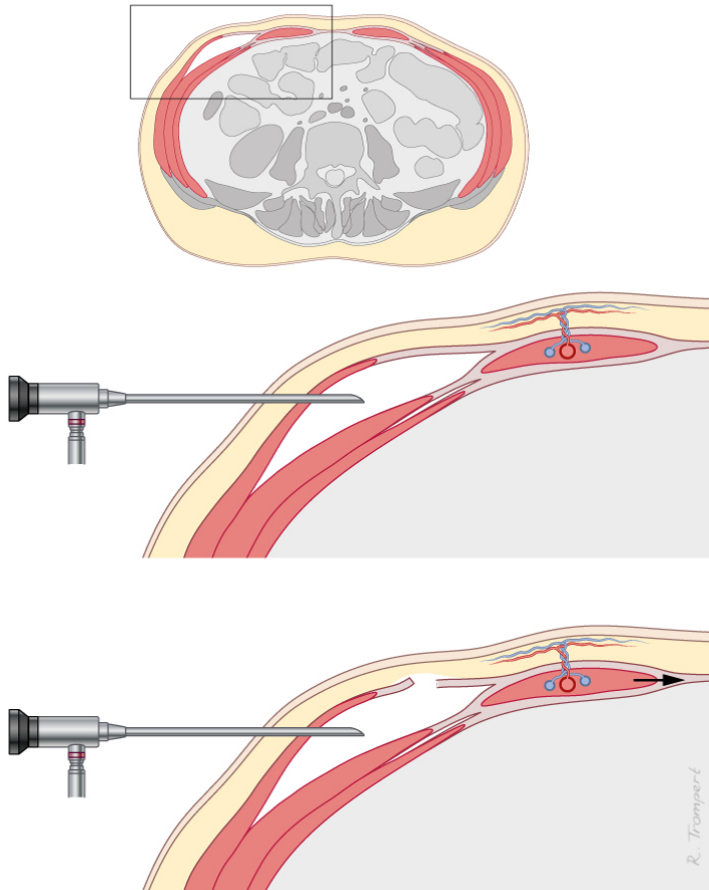
*Jensen et al. Surg Endo 2014*

## ECST versus CST - Systematic Reviews

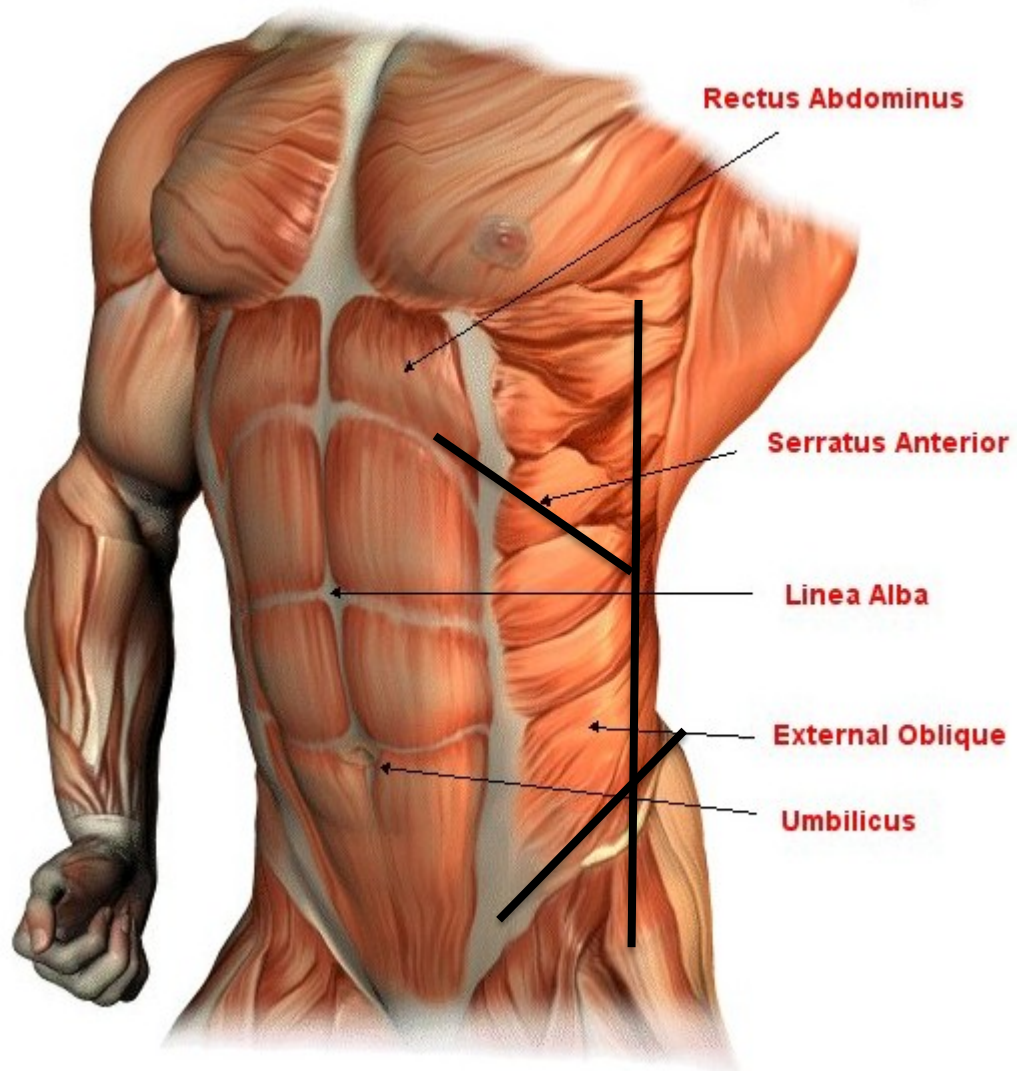


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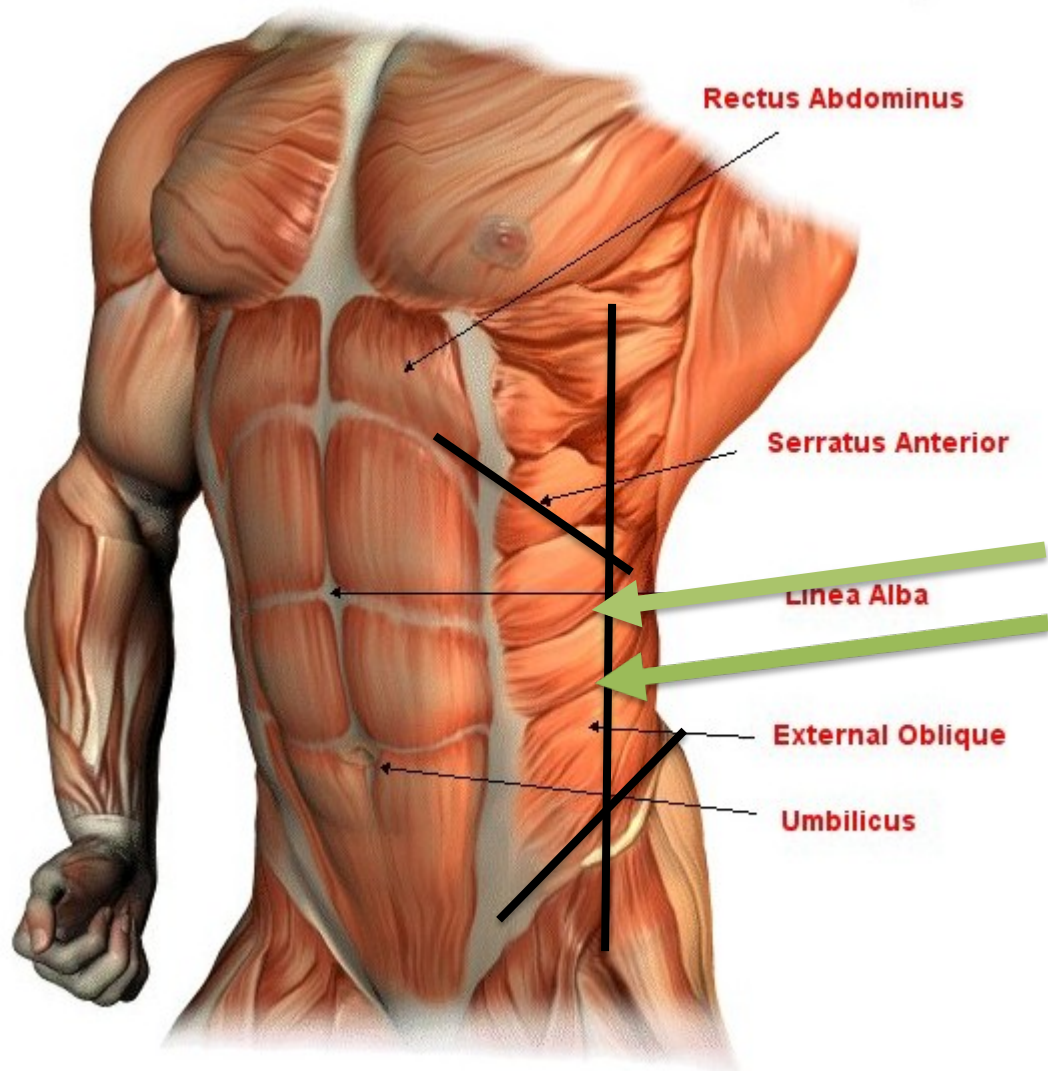




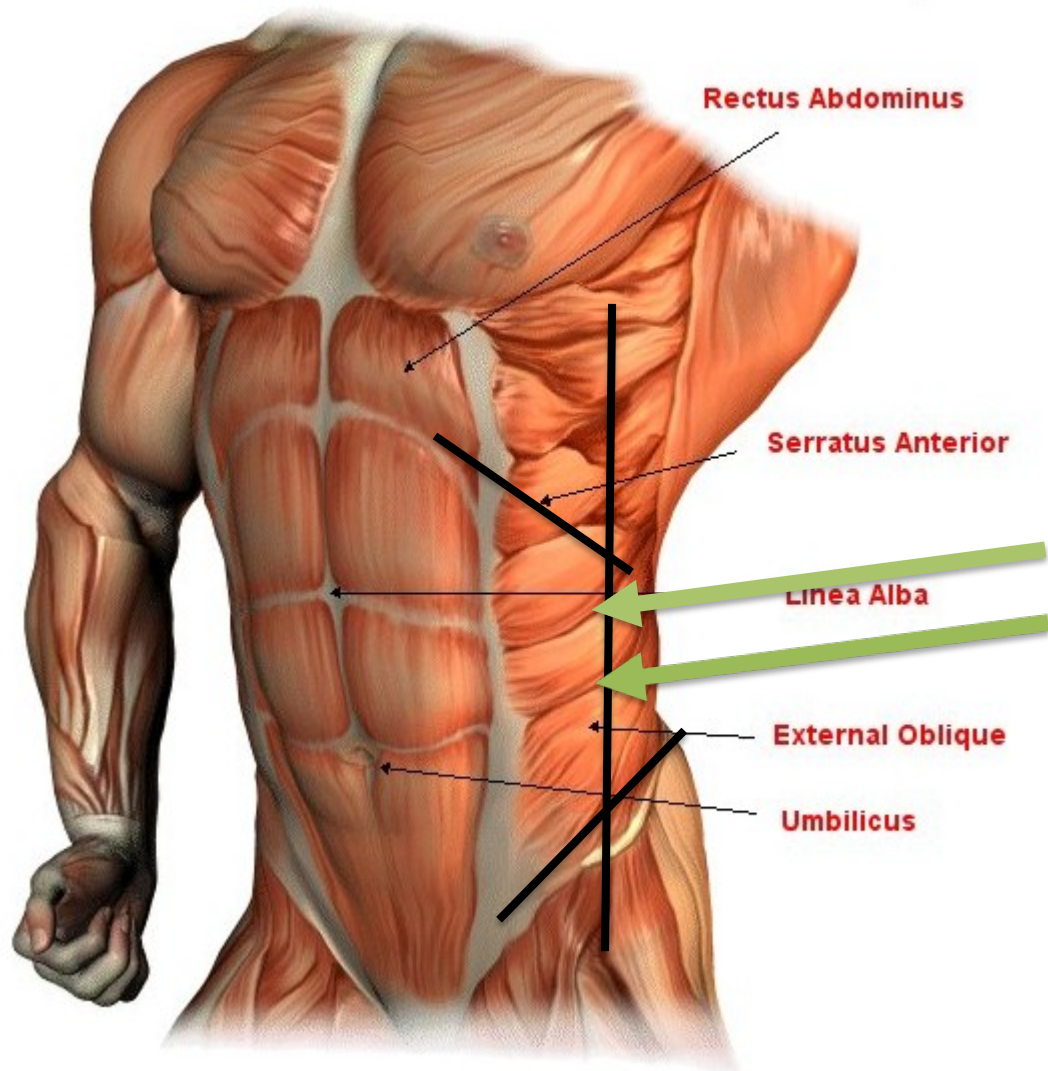


Endoscopically assisted components separation technique (ECST)



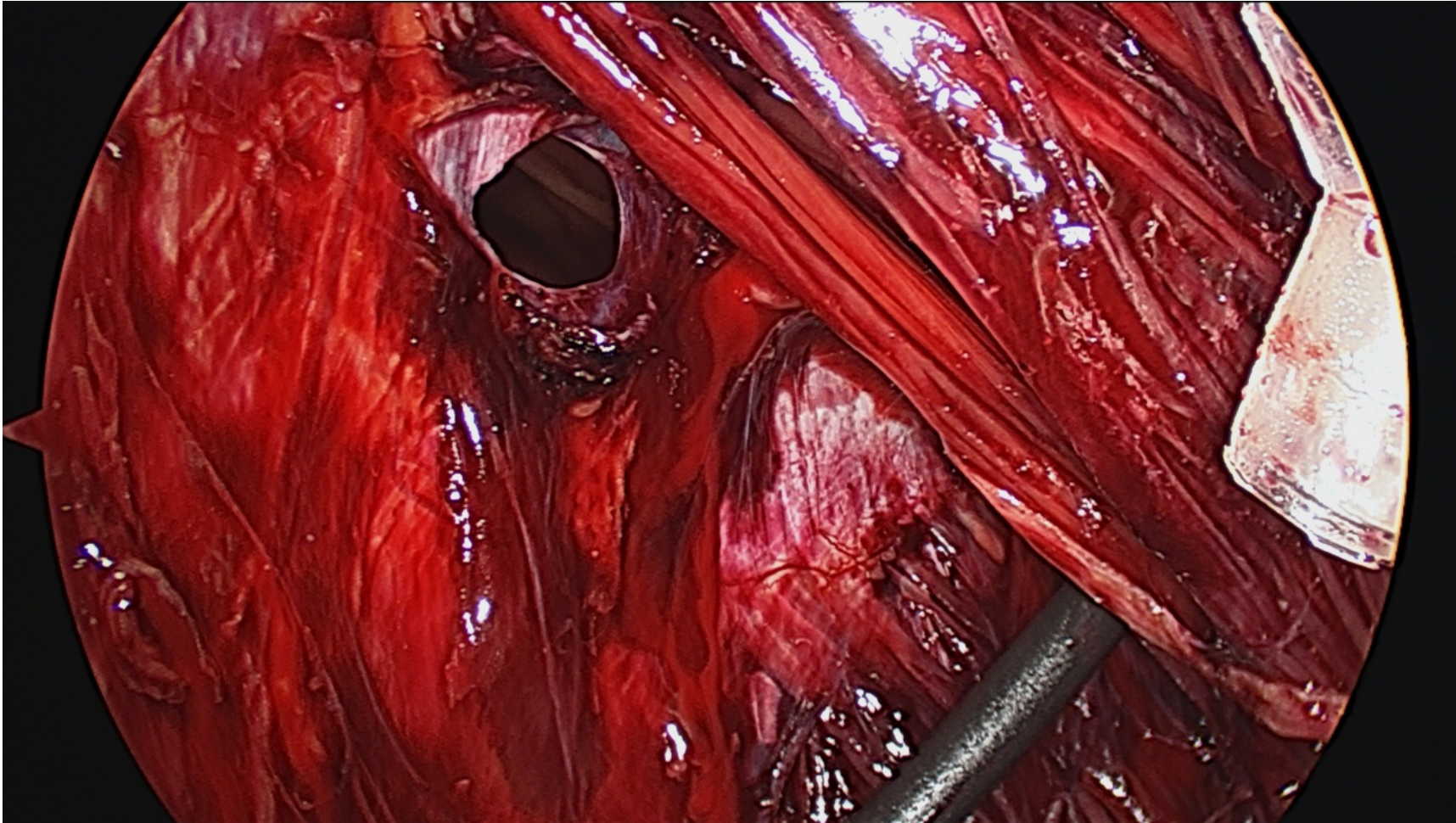


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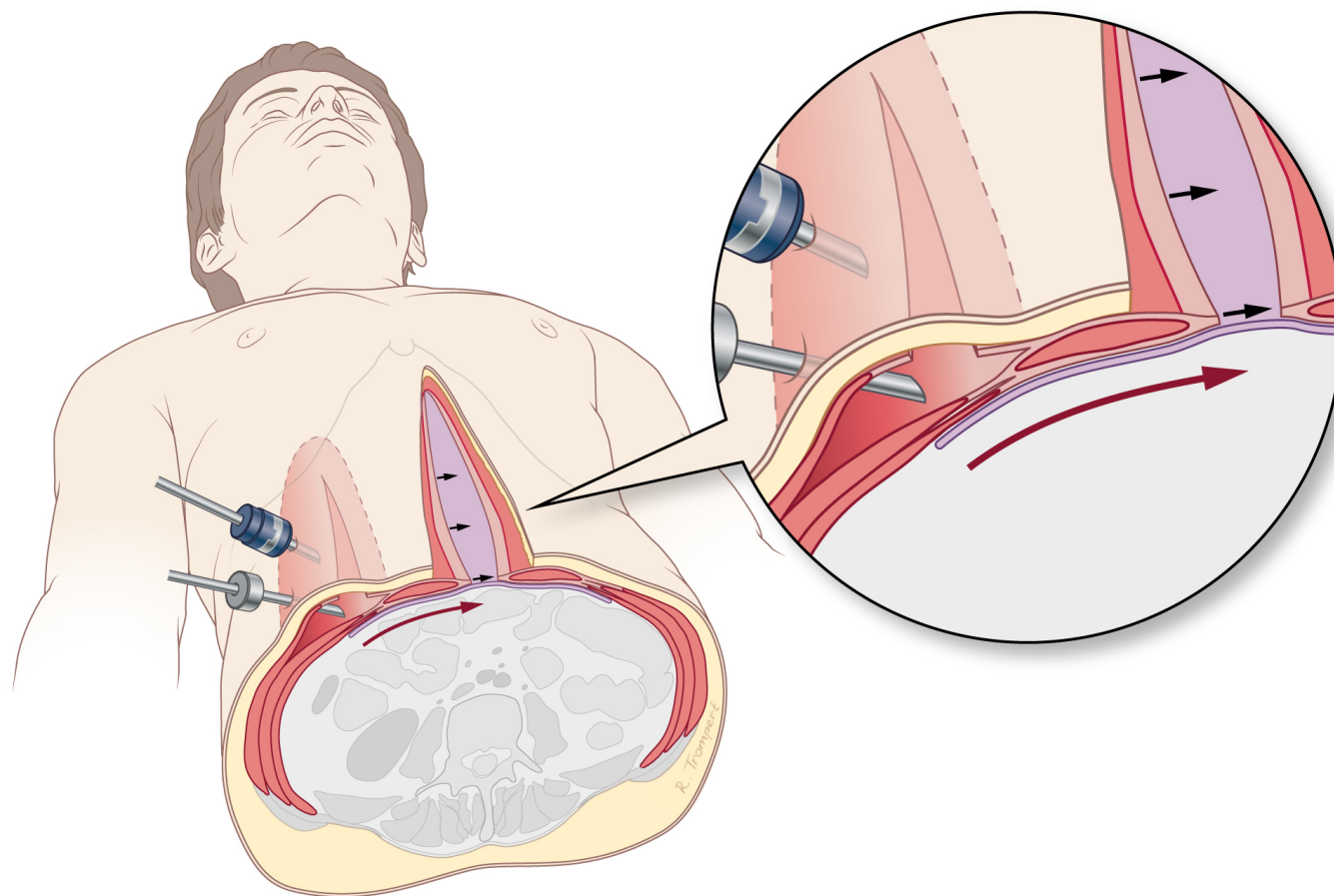
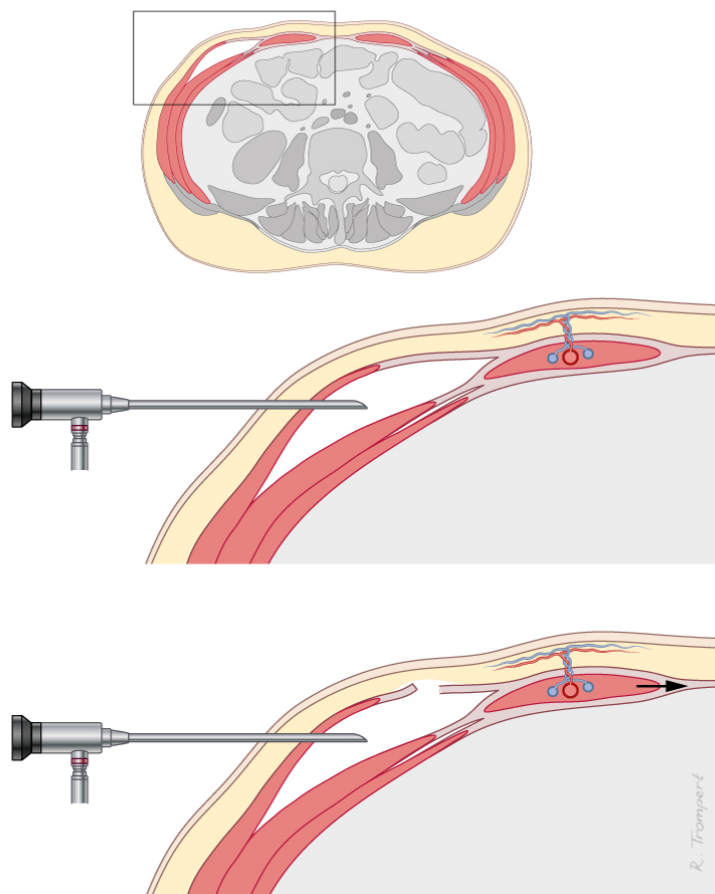
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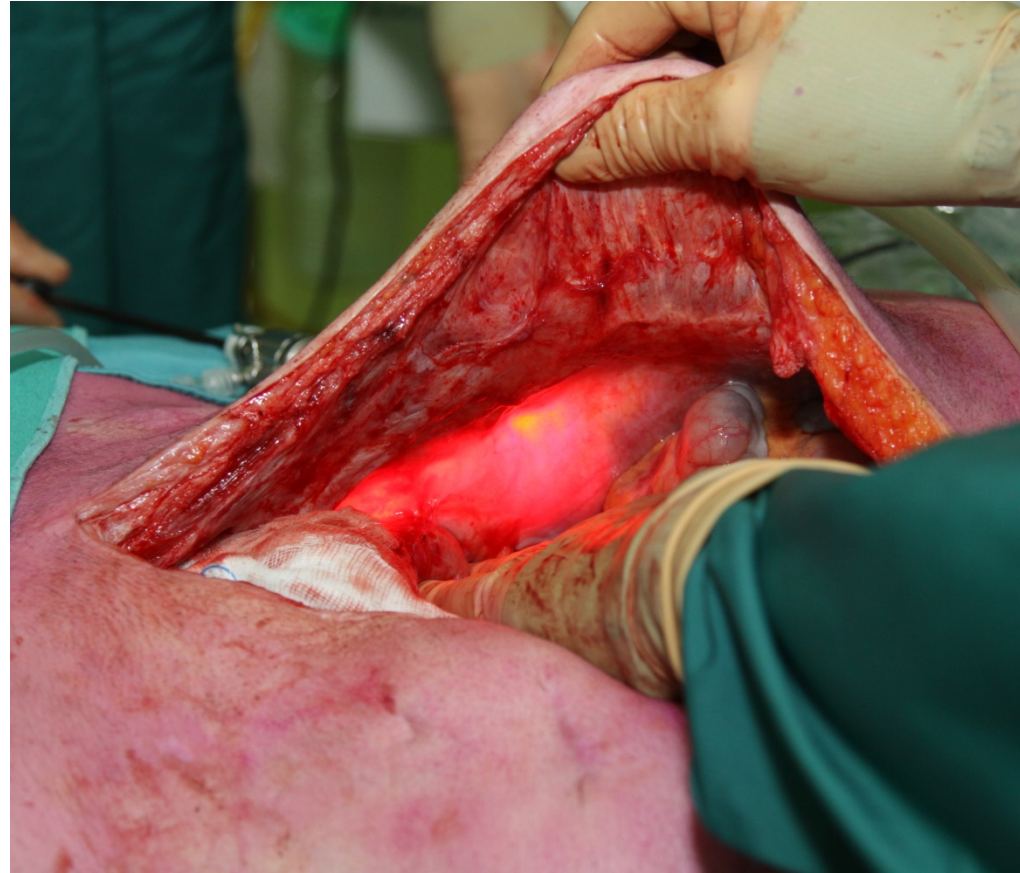




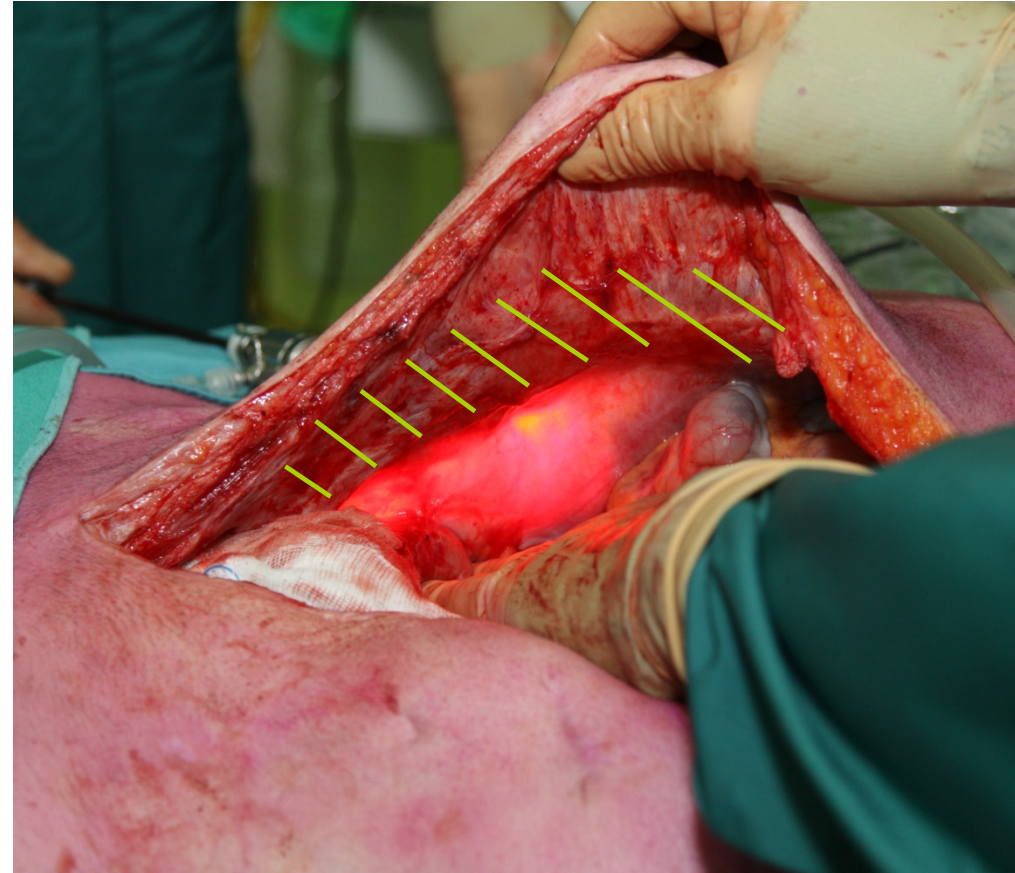
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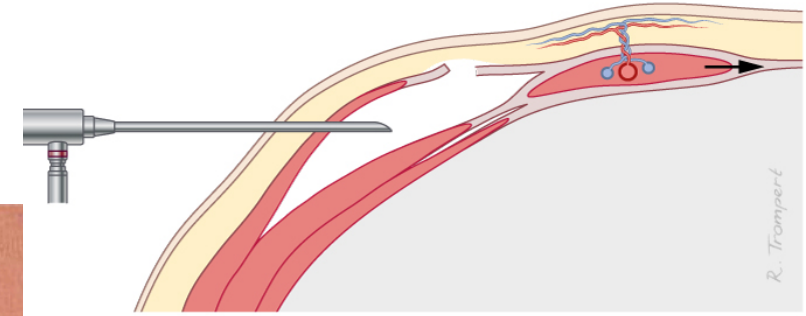
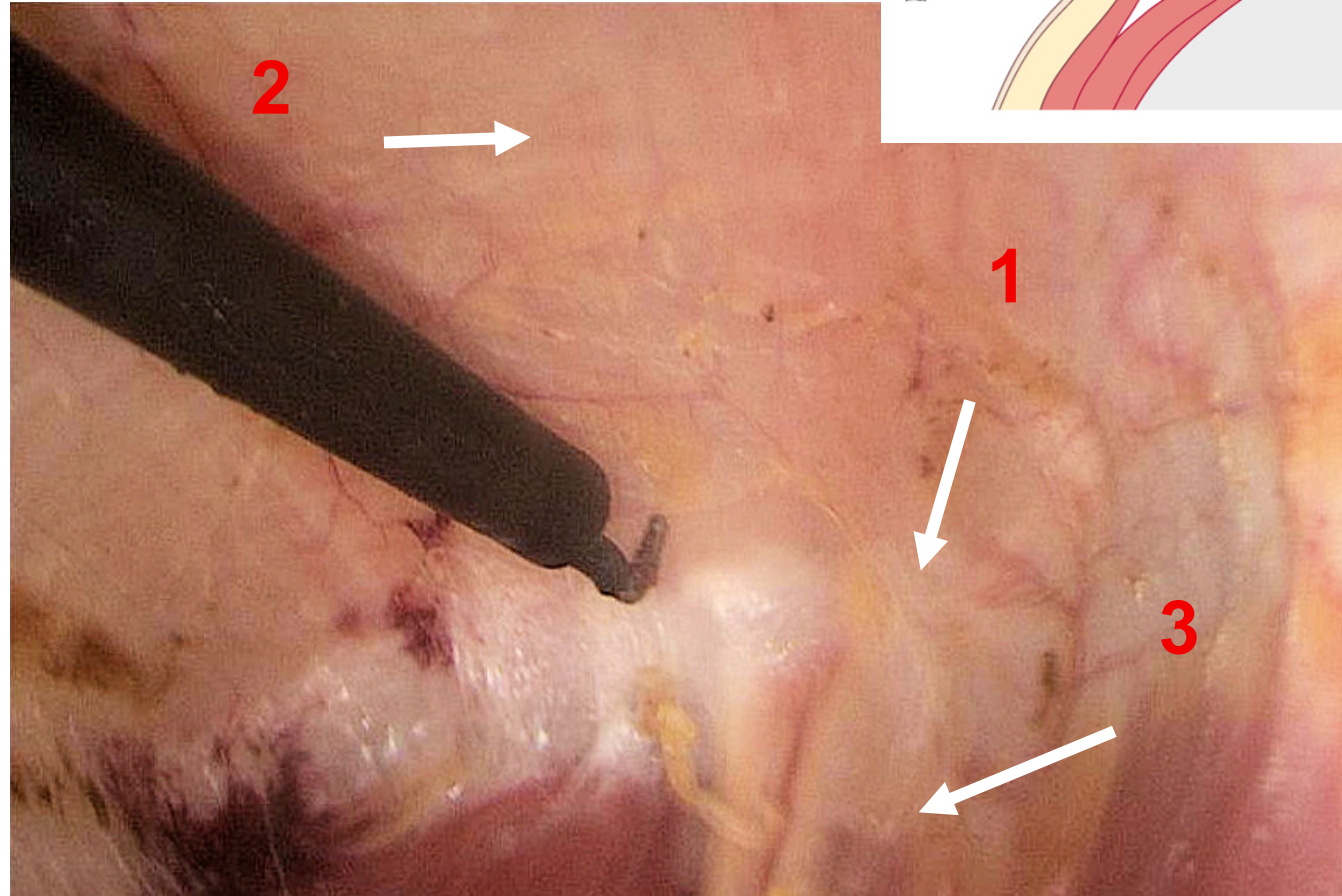






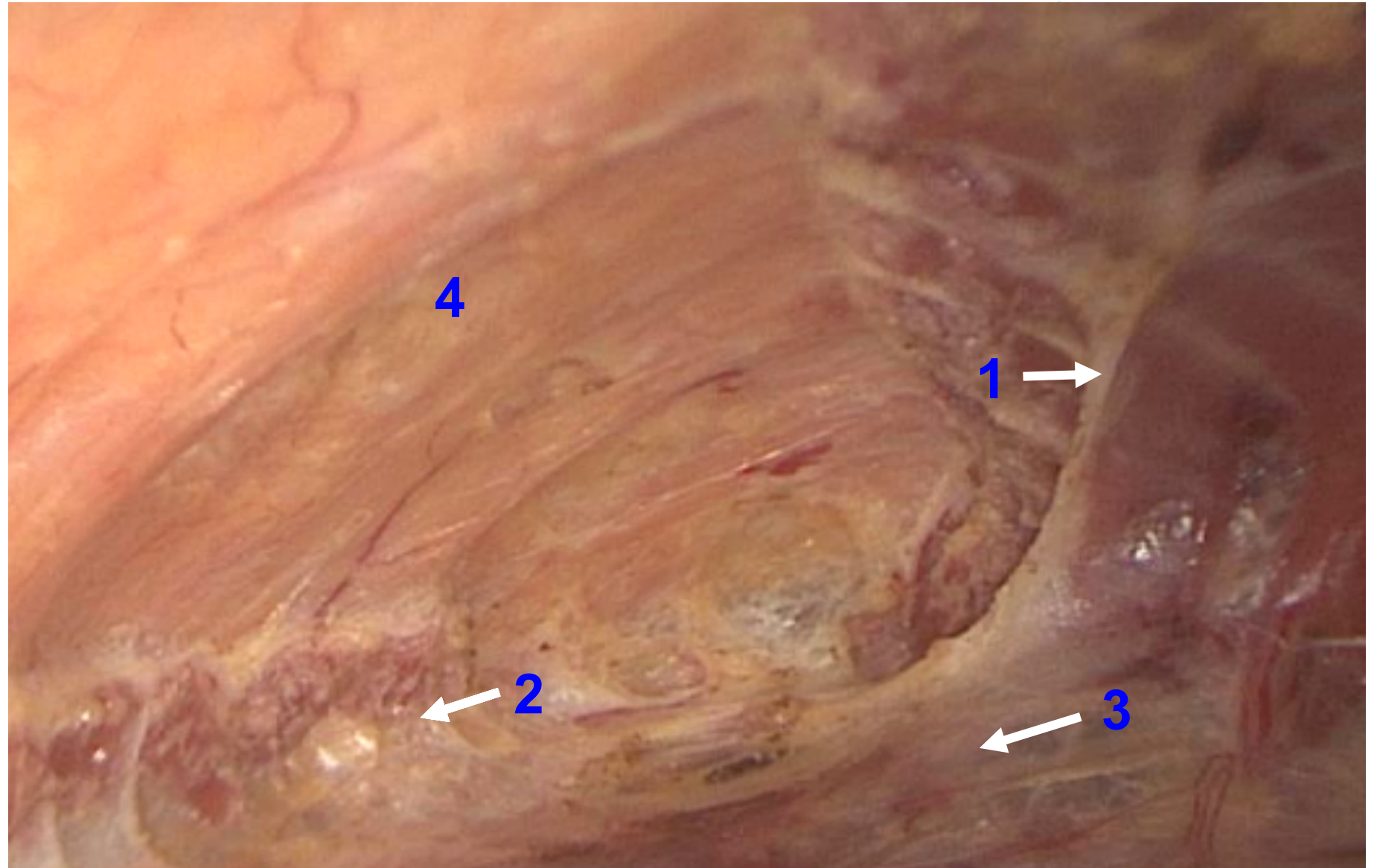


1. Aponeurosis rectus fascia
2. External Oblique Muscle
3. Internal Oblique Muscle

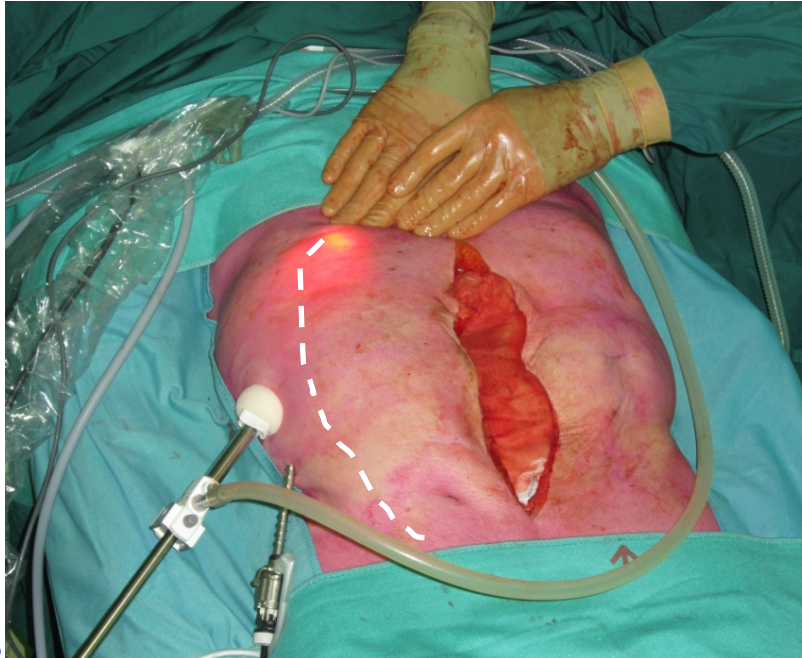




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3. Internal Oblique Muscle
4. Subcutaneous Tissue



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# Tips and Tricks ECST

- Patient selection
- Stoma presence
- Positioning of the patient / no shells
- Two monitors
- Small incision lateral / Visiport
- Right plane
- Big endoscopic pocket
- Bleeding ventral of the costa



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Hernia  
DOI 10.1007/s10029-016-1485-7

ORIGINAL ARTICLE

**How to perform the endoscopically assisted components separation technique (ECST) for large ventral hernia repair**

E. H. H. Mommers<sup>1,2</sup> · J. A. Wegdam<sup>1</sup> · S. W. Nienhuijs<sup>2</sup> · T. S. de Vries Reilingh<sup>1</sup>





# Methods

Clinical Quality Improvement Programme

Database

Evaluation of ECST with IPOM (2012-2013)



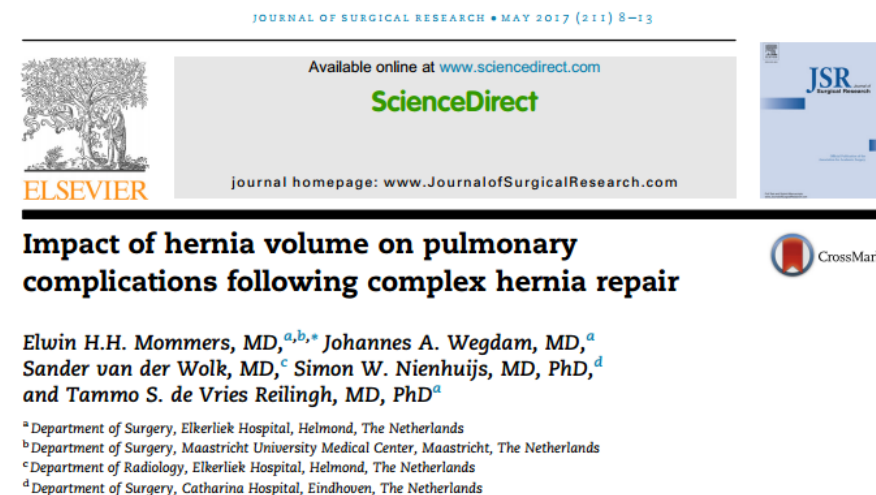
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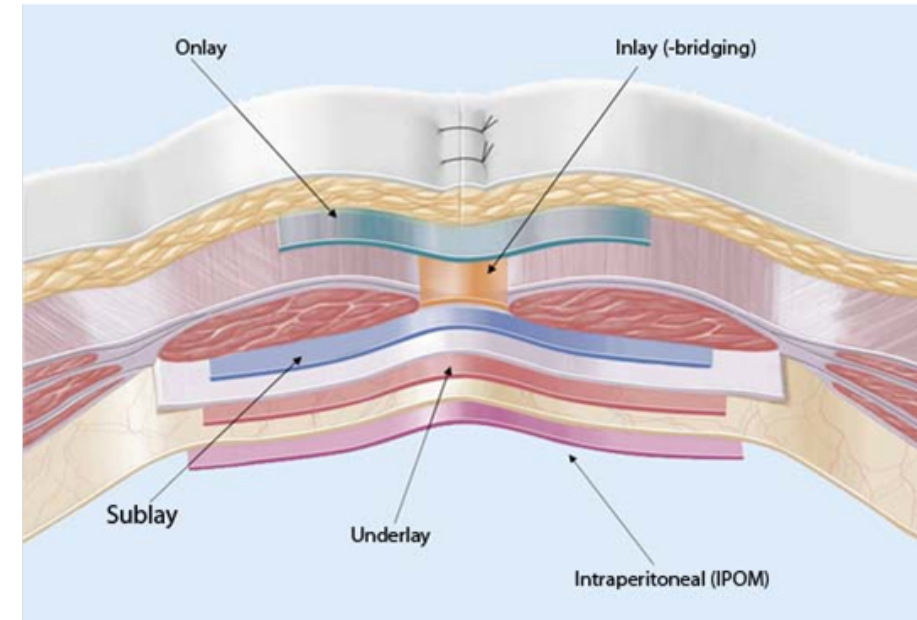
Endoscopically assisted components separation technique (ECST)

# Methods

IPOM (2012-2013) to Sublay (2014-2016)

Multidisciplinary approach

Patient selection



# Multidisciplinary approach

## Started 2014

- Surgeon (Catharina Hospital, Elkerliek hospital)
- Anesthesiologist
- Pulmonologist
- Intensive care doctor
- Dietician
- Physiotherapist
- Case manager





# Methods

- Database
- Clinical Quality Improvement Programme
- Evaluation of IPOM (2012-2013) & Sublay (2014-2016)
  - SSO's
  - Recurrence
  - Medical complications



# Patients 2012-2016

Preoperative Variable	IPOM (2012-2013)	Sublay (2014-2016)	Total
	N=22	N=26	N=48
<b>Age</b>	62	59	61 (34-83)
<b>Male</b>	64%	65%	31 (65%)
<b>Comorbidity</b>	37%	54%	22 (46%)
<b>BMI</b>	27	29	28
<b>Hernia</b>			
<b>Size (cm2)</b>	180	150	165±80
<b>Stoma present</b>	18%	12%	7 (15%)
<b>VHWG classification 2012</b>			
1 (low grade)	0	0	0
2 (comorbid)	82%	85%	40 (83%)
3 (contaminated)	18%	15%	8 (17%)



# Results

Intra operative characteristics	IPOM (2012-2013)	Sublay (2014-2016)	P (<0.05)
	n=22	n=26	
<b>SSO</b>	8 (36%)	5 (19%)	NS
<b>Recurrence</b>	2(9%)	1(4%)	NS
<b>All medical complications</b>	17 (77%)	10 (39%)	0.007
Cardiovascular	4	3	NS
Pulmonary embolism	4	0	0.04
Pneumonia	2	4	NS
Gastro-intestinal	8	3	0.04
<b>Follow up (mo)</b>	15	3	



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# Conclusion

ECST is a  
minimal invasive,  
well established technique



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ECST is a  
minimal invasive,  
well established technique  
also in contaminated fields





# Conclusion

ECST is a  
minimal invasive,  
well established technique  
also in contaminated fields  
that should be in the armatarium of every complex hernia surgeon



CAWR:  
Volume  
Centralisation  
Experience  
ECST,  
multidisciplinary team  
and  
Clinical Quality Improvement Programme  
reduces medical complications  
and improves quality



Tibetan Yoga Teacher

Internal bodymassage  
(Naule Kya) to clean  
intestines and prevent  
diseases



Endoscopically assisted components separation technique (ECST)



Quality improvement in complex abdominal wall reconstruction



# Medical complications underexposed

	Lowe 2000	Harth 2010	Giurgius 2012	Ghali 2012	Itani (RICH study) 2012	Fox 2013	Rosen (COBRA study) 2017	Elkerliek 2016
	ECST	ECST	ECST	MICS	Open VIH Primary closure/ bridging	Laparoscopic	Contaminated Biosynthetic mesh	ECST
<b>Subjects</b>	7	22	21	57	85	18	104	26
<b>Recurrence</b>	14%	27%	5%	4%	27%	17%	17%	<b>4%</b>
<b>SSO</b>	0%	27%	19%	14%	35%	6%	54%	<b>19%</b>
<b>Medical complications</b>	43%	42%	?	?	?	?	?	<b>39%</b>



# Meshes in contaminated fields

Grade 1	Grade 2	Grade 3	Grade 4
<b>Low Risk</b> <ul style="list-style-type: none"><li>• Low risk of complications</li><li>• No history of wound infection</li></ul>	<b>Comorbid</b> <ul style="list-style-type: none"><li>• Smoker</li><li>• Obese</li><li>• Diabetic</li><li>• Immunosuppressed</li></ul>	<b>Contaminated</b> <ul style="list-style-type: none"><li>• Previous wound infection</li><li>• Stoma present</li><li>• Violation of GI tract</li></ul>	<b>Infected</b> <ul style="list-style-type: none"><li>• Infected mesh</li><li>• Septic dehiscence</li></ul>

	Phasix US Study	COBRA <sup>1</sup> Study (BioA)	RICH <sup>2</sup> Study (Sttrattice)
Follow-up	18 month	24 month	24 month
Number of subjects	121	104	80
Hernia Recurrence	9%	17%	28%
Surgical Site Infection	9%	18%	35%
Seroma	6%	3%	6%

REFERENCES:  
1. Rosen M, et al (2017) Annals of Surgery 265:205-211.  
2. Itani KM, et al (2012) Surgery 152:498-505.

NOTE: Naïve Indirect Comparisons, like this one, have equivalent evidence to that of observational studies.



# Endoscopic assisted Components Separation Technique

- 2012-2016
- 49 patients
- IPOM (Ventralight ST mesh) vs retromuscular (Soft Tissue mesh or Phasix mesh)
- 23 vs 26 patients
- Male 60%
- Mean age 65
- Mean BMI 28
- 53% co-morbidity
- 10% contaminated wounds
- Defect  $182 \pm 60 \text{ cm}^2$

*Components Separation Technique for complex ventral hernia*

# Endoscopic assisted Components Separation Technique

## Results

- Mean operation time 146±60 minutes
- Mean hospital stay: 6.5 days
- SSO: 16%
- Cardiopulmonary and GI complications 48% vs 15% (p 0.03)
- Mean follow-up: 9 (0-44) months
- Recurrence: 3 patients (2 after IPOM) (6%)