



**Επείγουσα Χειρουργική και
Τραύμα (MSC in Emergency
Surgery and Trauma)**

Εθνικό και Καποδιστριακό Πανεπιστήμιο
Αθηνών

ΣΥΓΚΛΕΙΣΗ ΚΟΙΛΙΑΣ ΜΕ ΤΑΣΗ

Παναγιώτης Κοκορόπουλος
Χειρουργός

DAMAGE CONTROL LAPAROTOMY/EMERGENCY LAPAROTOMY

Damage-control laparotomy (DCL) is a widely accepted technique for the management of patients with life-threatening traumatic injuries and abdominal sepsis.¹⁻⁴ DCL is a multiple-stage procedure designed to provide rapid hemostasis, control contamination, allow rapid resuscitation, and avoid abdominal compartment syndrome. To achieve this, the abdominal fascia is left open, with plans for a second-look operation in which packs are removed, missed injuries are identified, and definitive repairs are made. If possible, a tension-free fascial closure is then performed.^{3,4}

Baltimore 2015

 Open Access Full Text Article

ORIGINAL RESEARCH

Early abdominal closure using component separation in patients with an open abdomen after trauma: a pilot study

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ORIGINAL RESEARCH

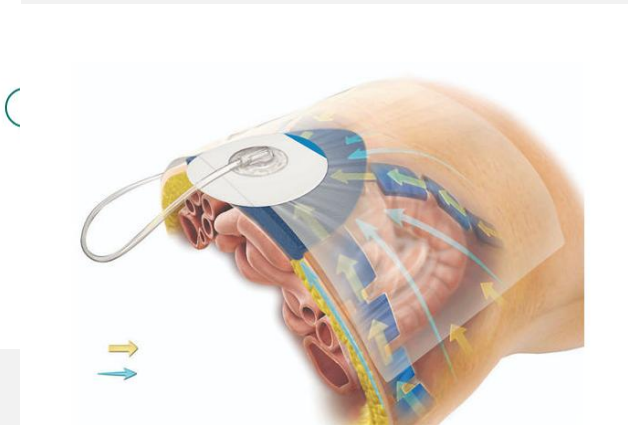
Early abdominal closure using component separation in patients with an open abdomen after trauma: a pilot study

ΤΥΠΙΚΟ ΣΕΝΑΡΙΟ ΤΡΑΥΜΑΤΟΣ

- DCL
 - Οίδημα εντέρου
 - Ανάγκη για re-look laparotomy
-
- OPEN ABDOMEN
 - ABDOMINAL CLOSURE DEVICES (NEGATIVE PRESSURE)
 - Προσωρινή σύγκλειση +/- πλέγμα. MTX κήλη. Τελική Αποκατάσταση σε 6-12 μήνες.

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- 
- Μείωση απώλειας υγρών
 - Αποφυγή αποξήρανσης εντέρου/Ρήξη/Fistula
 - Μείωση λοιμώξεων

Η΄ΕΝΑΛΑΚΤΙΚΑ

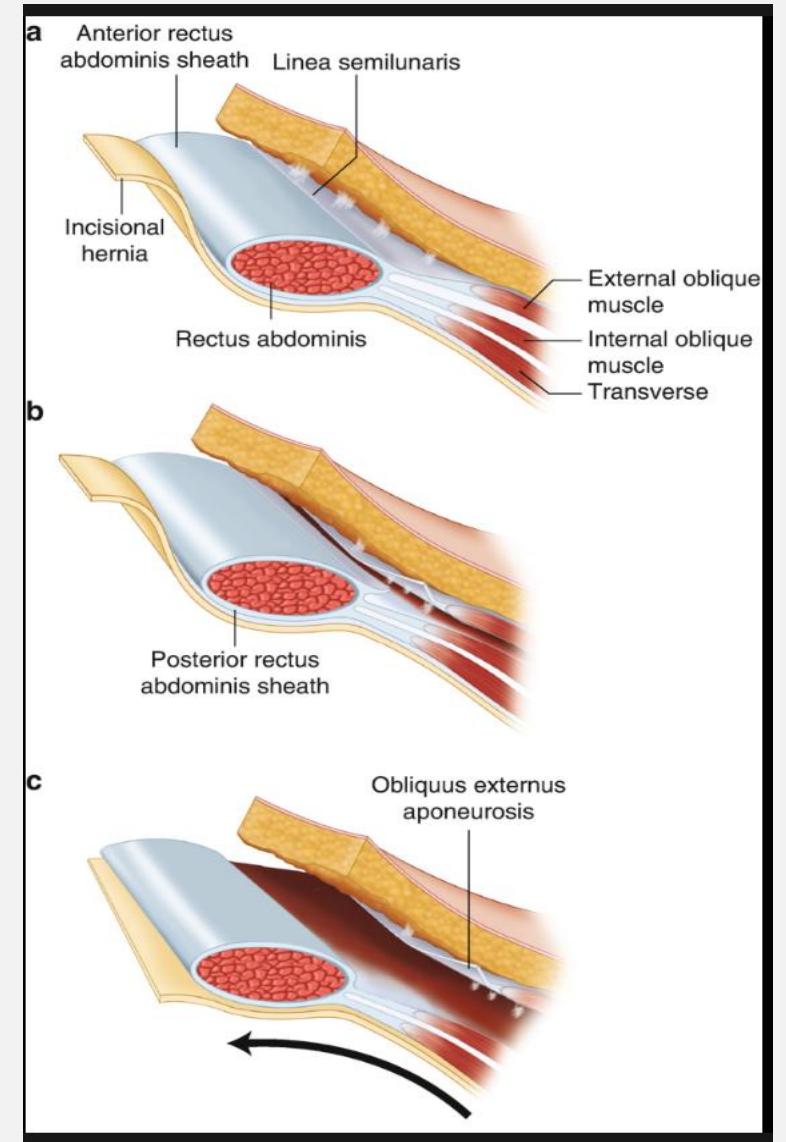
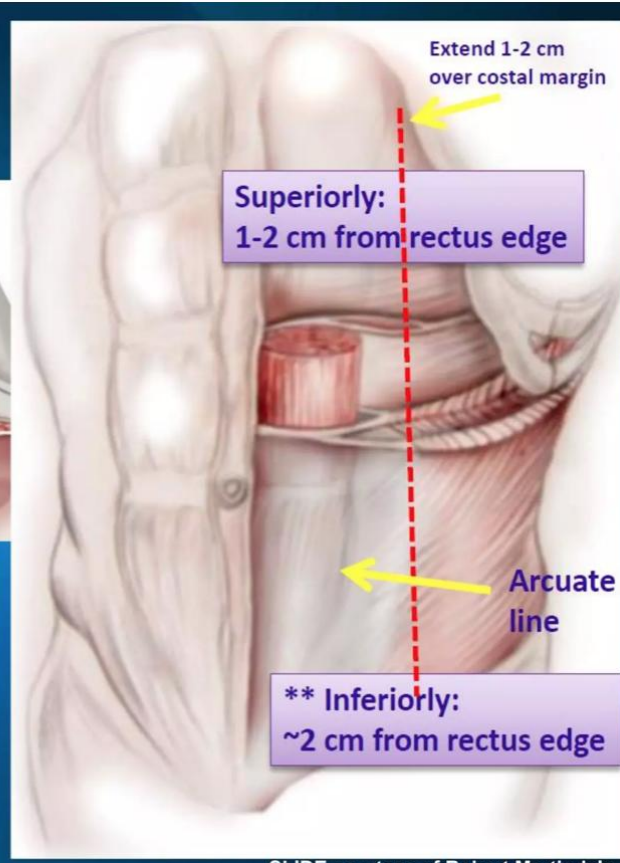
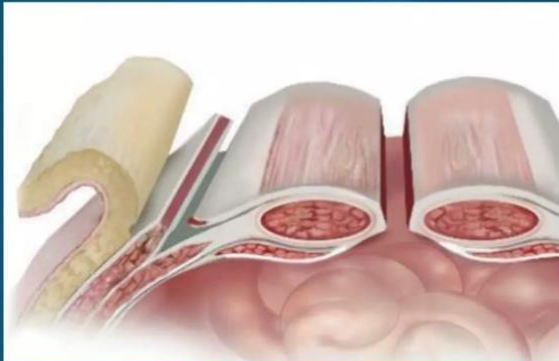
- Πρώιμη σύγκλειση σε ασθενείς που η βιολογία τους το επιτρέπει εντός 2 εβδομάδων.
- Προϋποθέσεις
- Απουσία ενδοκοιλιακής σήψης
- Μόνιμη/τελική σύγκλειση. (στομίες?Νεα λαπαροτομία?)
- Tension free / Απογαλακτισμός από αναπνευστήρα (Peak airway pressure!!)

ΣΥΓΚΛΕΙΣΗ ΚΟΙΛΙΑΣ/COMPONENT SEPARATION

- Component Separation Technique CST
- 1990 Ramirez for large ventral hernia. NO MESHREVOLUTION!!!!
- Ιδανική τεχνική για τραύμα.
- Χωρίς ξένα σώματα
- Για μεγάλα ως και 20εκ ελλείμματα
- Λειτουργικό κοιλιακό τοιχωμα
- Σε μολυσμένο περιβάλλον
- Τεχνικά εύκολη/Γρήγορη

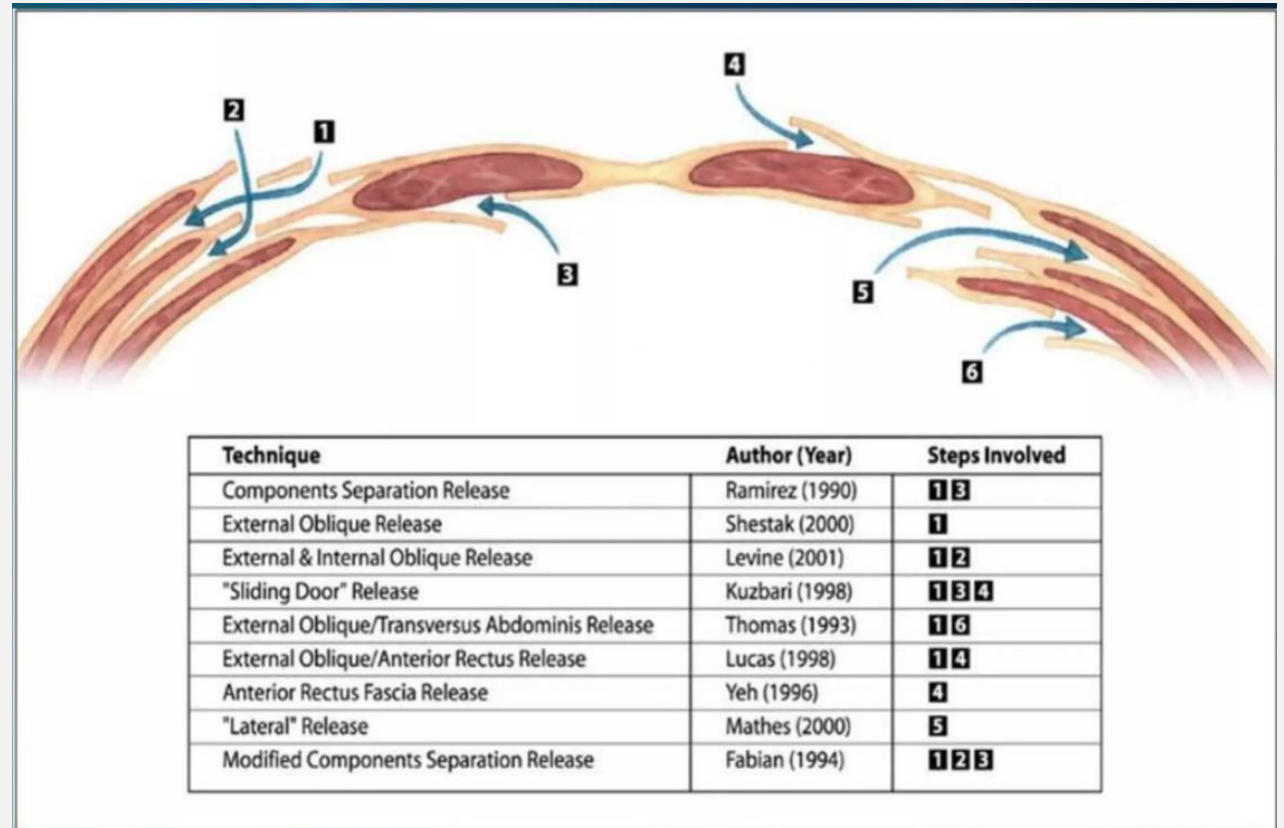
ANTERIOR/CLASSIC COMPONENT

Traditional Components Separation



CST

- Anterior Component
- Posterior Component
- Combined Component
- Posterior Component with TAR
- Anterior Component with Onlay MESH
- Posterior Component with Sublay MESH
- Endoscopic and laparoscopic CST



WHY?? SO MANY COMPONENTS

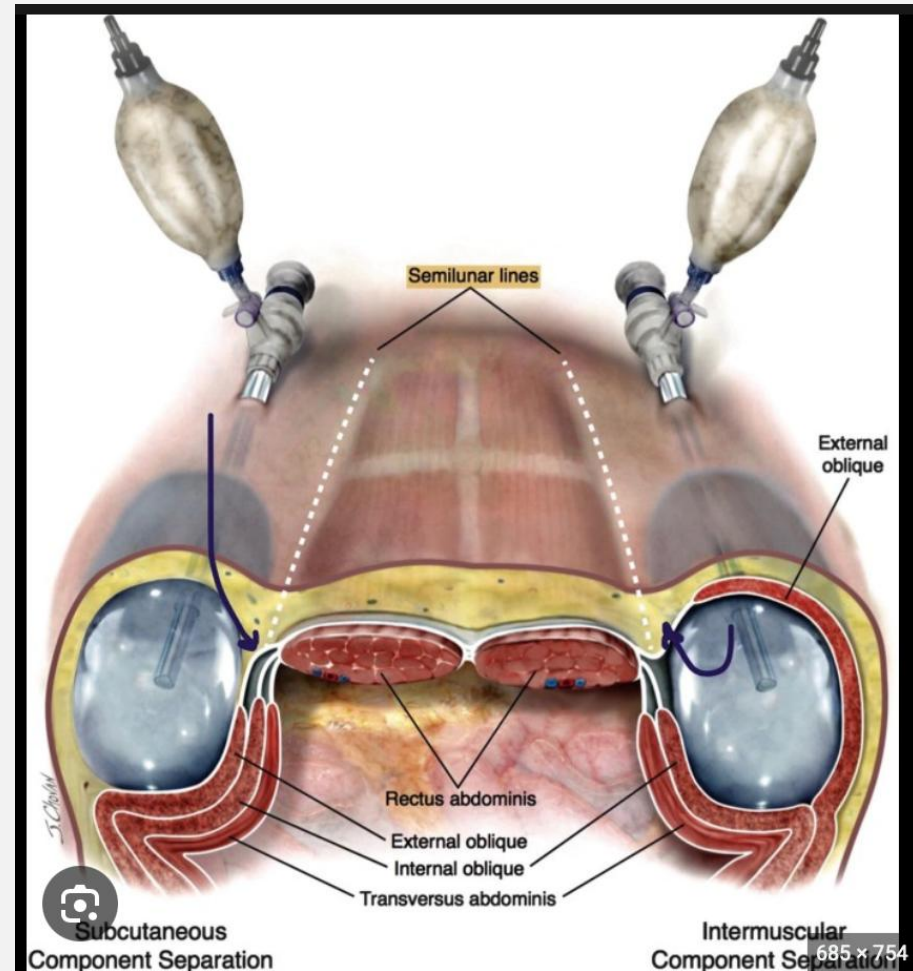
- Επιπλοκές:50%
- Ισχαιμία/ Νεκρωση δέρματος/ Λοιμωξη 20%
- Seroma 9%
- Αιματωμα 8%
- Κήλη 16-27%
- Πόνος
- Παρατεταμένη MTX νοσηλεία

Tong WM, Hope W, Overby DW, Hultman CS. Comparison of outcome after mesh-only repair, laparoscopic component separation, *and open component separation*. *Ann Plast Surg* (2011) 66(5):551–6. doi: 10.1097/SAP.0b013e31820b3c91

Deerenberg EB, Timmermans L, Hogerzeil DP, Sliker JC, Eilers PH, Jeekel J, et al. A systematic review of the surgical treatment of large incisional hernia. *Hernia* (2015) 19(1):89–101. doi: 10.1007/s10029-014-1321-x

ENDOSCOPIC ANTERIOR CS

- 10mm BALLON spacer
 - 5mm bipolar scissors
 - 30o Camera lap
 - No mesh
-
- Perforator sparing
 - Less Complications
 - Guidelines in favor of endoscopic vs open.

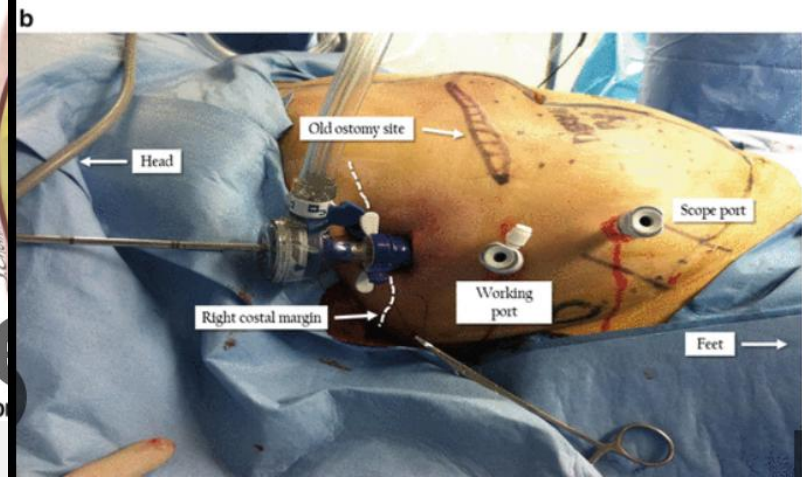
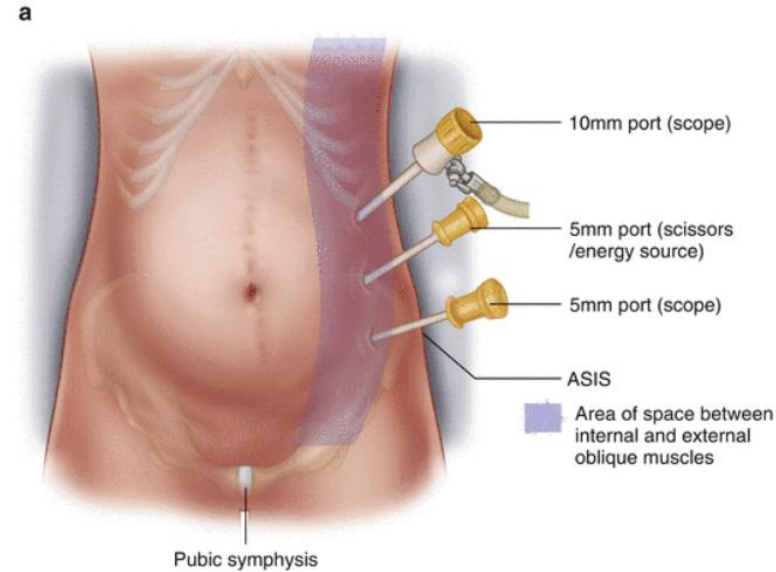


ENDOSCOPIC ANTERIOR CS

Complication	OPEN	ENDO
Sup Infection	8.9	3.5
Necrosis	6.8	2.1
Seroma/Haemat	7.4	4.6
Total	34.6	20.6

Switzer NJ, Dykstra MA, Gill RS, Lim S, Lester E, de Gara C, et al.

Endoscopic versus open component separation:
systematic review and
meta-analysis. Surg Endosc (2015)



OPEN VS MI (ENDOSCOPIC)

Complications	Open CST and TR (%)	MICST and TR (%)
Superficial infections	8.9	3.5
Skin dehiscence	8.2	5.3
Skin necrosis	6.8	2.1
Haematoma/seroma	7.4	4.6
Fistul	1	.4
Fascial dehiscence	.4	0
Intra-abdominal abscess	3.8	4.6
Mortality	.4	.6
Recurrence	11.1	15.1
Meta analysis of 63 primary studies (3055 patients) by Noah J Switzer et al, Surgical endoscopy 29(4),787-795,2015		

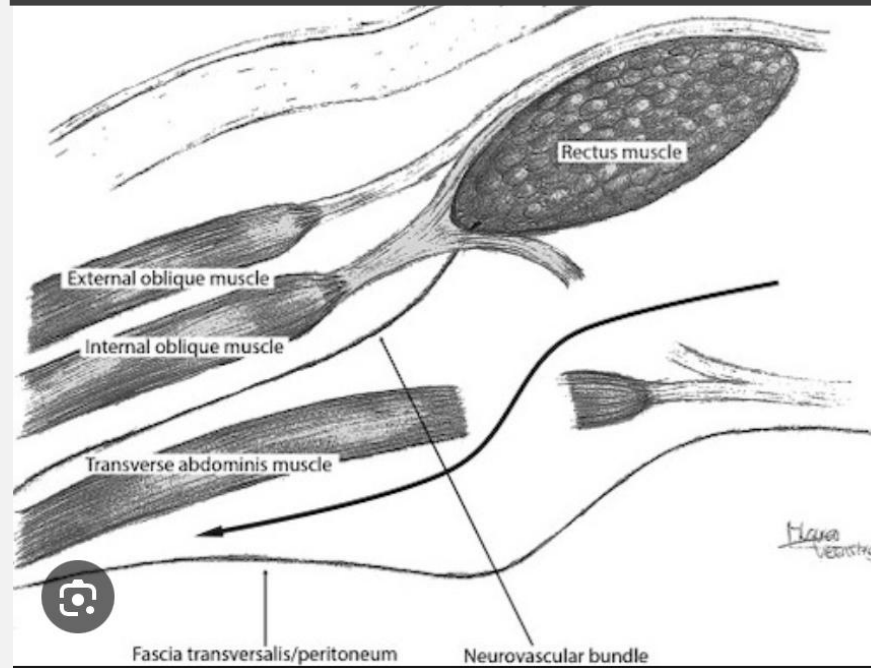
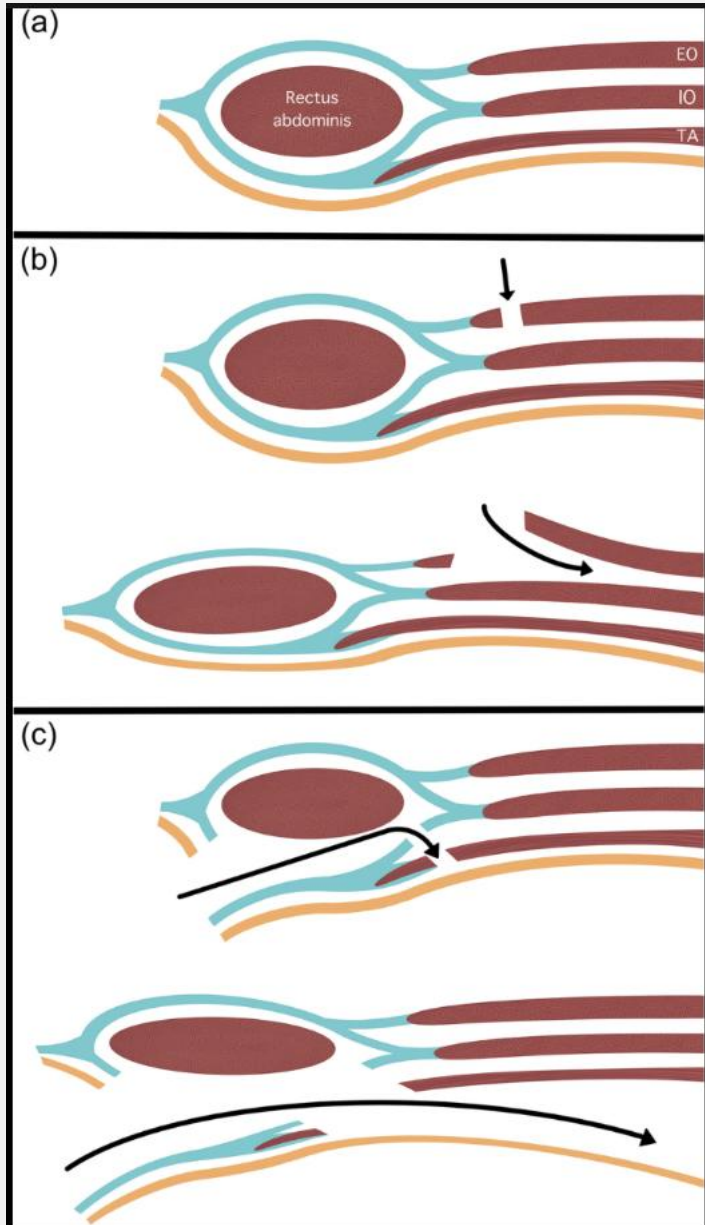
ΕΡΩΤΗΣΗ 1

- Ποιο από τα παρακάτω είναι αληθές
- Α. Επιπλοκές σχετιζόμενες με το χειρουργικό τραυμα στην κλασσική Ant Comp Sep ανέρχονται στο 50%
- Β. Στην endoscopic Ant Comp Sep χρησιμοποιείται πλέγμα.
- Γ. Στην endoscopic Ant Comp Sep δεν γίνεται σύγκλειση της μέσης γραμμής
- Δ. Δεν είναι δυνατόν να συνδιαστεί Ant Comp Sep με τελική κολοστομία

ΕΡΩΤΗΣΗ 1

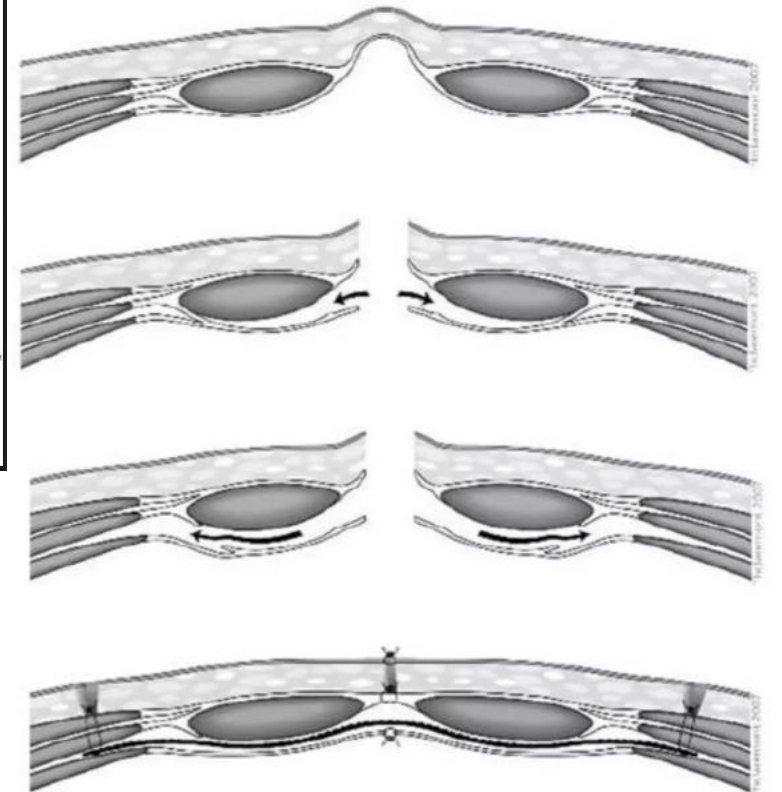
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ANTERIOR VS POSTERIOR VS POSTERIOR WITH TAR

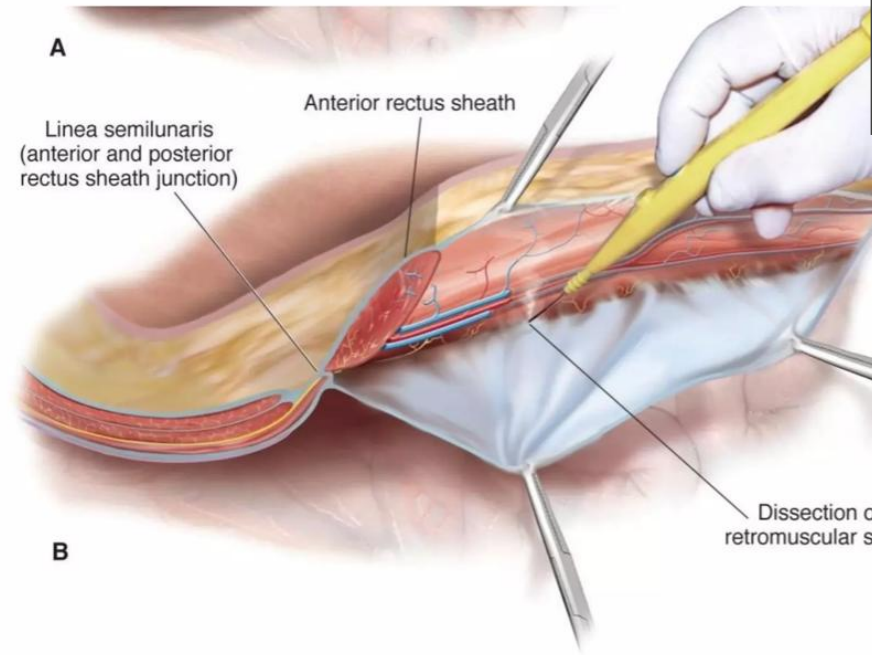


- *Difficult to perform*
- *Less pull (6-8 cm) than Ramirez's CST*

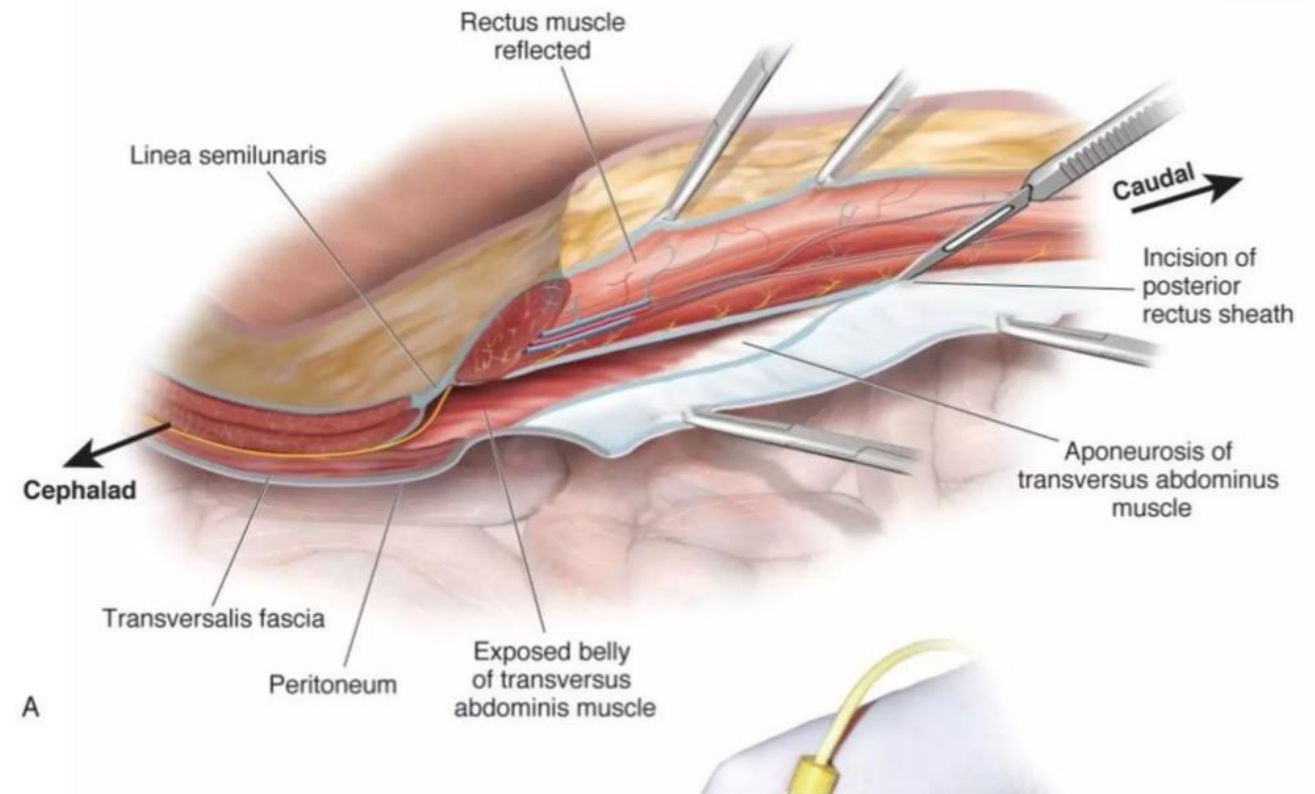
Separation



Dissect to linea semilunaris



POSTERIOR COMPONENT WITH TAR/STEPS



Novitsky YW, Elliott HL, Orenstein SB, Rosen MJ. Transversus abdominis muscle

release: a novel approach to posterior component separation during complex abdominal wall reconstruction. Am J Surg (2012) 204(5):709–16. doi: 10.1016/j.amjsurg.2012.02.008

Dissect to linea semilunaris

POSTERIOR COMPONENT WITH

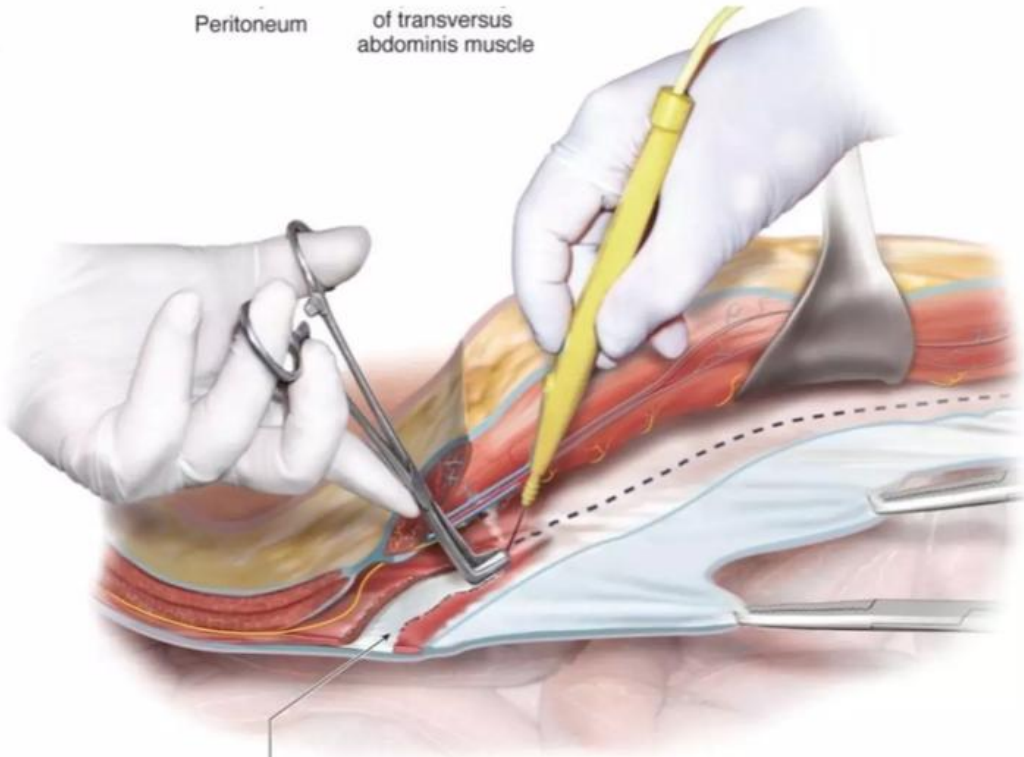
Transversus abdominis release



A

A

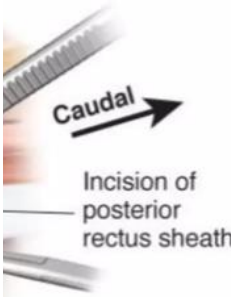
Peritoneum of transversus abdominis muscle



B

B

Transversus abdominis release (TAR)



Aponeurosis of transversus abdominis muscle

Dissect to linea semilunaris

Transversus abdominis release

Completion of release and midline advancement

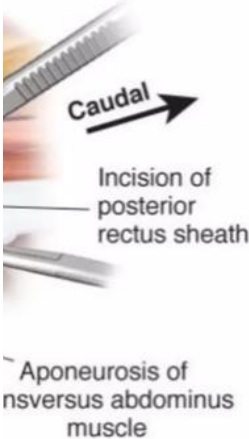
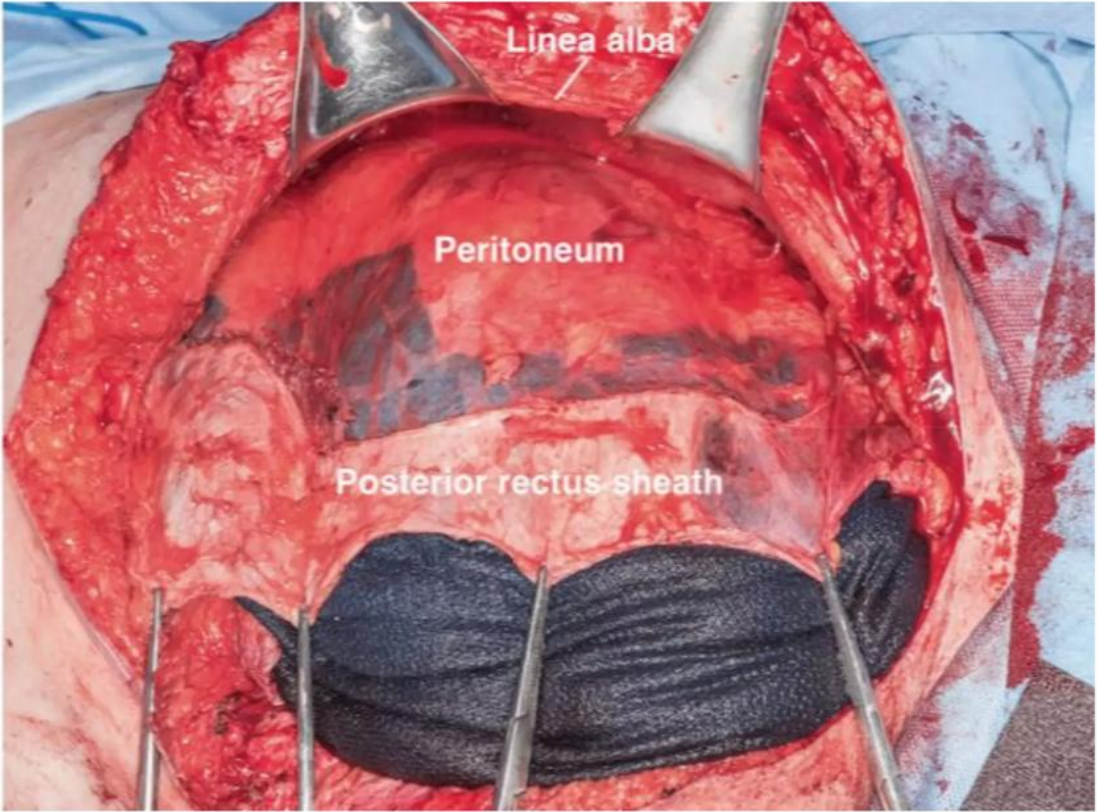
POSTERIOR COMPONENT WITH TAR/STEPS

A



B

Transve



POSTERIOR COMPONENT SEPARATION +/- TAR

CST	Anterior	Posterior
Wound Complication	48.2	25.5
Reccurence	14.3	3.6

Krpata DM, Blatnik JA, Novitsky YW, Rosen MJ. Posterior and open anterior components separations: a comparative analysis. **Am J Surg (2012)** 203(3):318–22

Pauli EM, Wang J, Petro CC, Juza RM, Novitsky YW, Rosen MJ. Posterior component separation with transversus abdominis release successfully addresses recurrent ventral hernias following anterior component separation. **Hernia (2015)** 19(2):285–91. doi: 10.1007/s10029-014-1331-8

Cornette B, de Bacquer D, Berrevoet F. Component separation technique for giant incisional hernia: a systematic review. **Am J Surg (2017)**:1–8. doi: 10.1016/j.amjsurg.2017.07.032

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Pauli EM, Wang J, Petro CC, Juza RM, Novitsky YW, Rosen MJ. **Posterior component separation with transversus abdominis release successfully addresses recurrent ventral hernias following anterior component separation.**

Hernia (2015) 19(2):285–91. doi: 10.1007/s10029-014-1331-8

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ΕΡΩΤΗΣΗ 2

- Τι ΔΕΝ περιλαμβάνει το **POSTERIOR COMPONENT SEPARATION**
- Α. Τοποθέτηση πλέγματος
- Β. Διατομή των perforators προς το υπερκείμενο δέρμα
- Γ. Διατήρηση του νευραγγειακού πλέγματος μεταξύ εσω λοξού και εγκαρσίου κοιλιακού
- Δ. Σύγκλειση της μεσης γραμμής στο υψος της linea alba.

ΕΡΩΤΗΣΗ 2

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- Δ. Σύγκλειση της μεσης γραμμής στο υψος της linea alba.

OVERALL

Ventral hernia repair recommendations (EHS)

Abd. Wall defect	Closure of defect	Release of abd. Wall component	Mesh reinforcement
<2 cm defect	Suture closure	No	No
2-4 cm defect	Suture closure	No	Subcutaneous or Intra-Peritoneal Onlay mesh (IPOM) >5cm overlap
4-10 cm defect	Suture closure	Anterior component separation	Retro rectus Sublay mesh (Reeve-stoppa space)
> 10 cm defect	Suture closure	Unilateral / Bilateral Posterior Component separation (PCS), Transversus Abdominis release (TR)	Retromuscular and superficial to sheath-peritoneal complex
>10 cm defect + Domain loss + obesity	Suture closure	Bilateral Posterior Component separation (PCS), Transversus Abdominis release (TR)	Retro-muscular and superficial to sheath-peritoneal complex Xiphoid to pubis to psosas

Review Article

A Feasible Operative Treatment Strategy for Trauma Patient with Difficulties in Closing the Abdomen during Open Abdomen Management (OAM) Following Damage Control Surgery-Secondary Publication[☆]

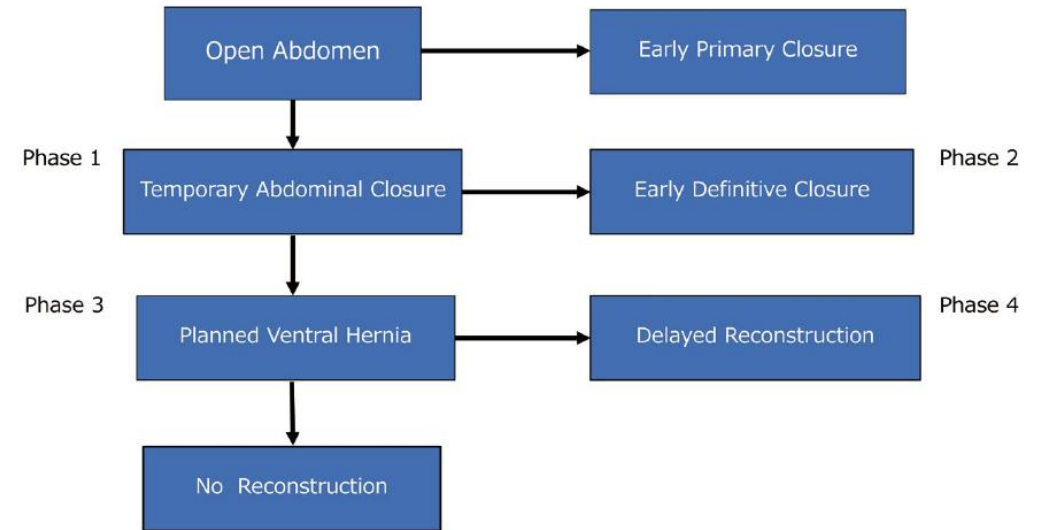
Futoshi Nagashima ^{a,*}, Satoshi Inoue ^b

^a Department of Emergency Medicine, Advanced Emergency Medicine and Critical Care Center, Saga University Hospital, Saga, Japan

^b Division of Trauma Surgery and Surgical Critical Care, Saga University Hospital, Saga, Japan

Early abdominal closure using component separation in patients with an open abdomen after trauma: a pilot study

This article was published in the following Dove Press journal:
Open Access Surgery
24 February 2015
[Number of times this article has been viewed](#)



Conclusion

The present findings suggest that early abdominal closure using CS with a non-cross-linked PADM is safe and effective. This technique appears to be potentially cost-effective, since only one operation is required and there is a decrease in hospital LOS and ventilator days. To evaluate the potential of this technique fully in terms of safety, clinical benefit, and cost-effectiveness, future larger-scale studies are needed. We believe the data from our study serve as an important starting point.

ΕΡΩΤΗΣΗ 3

- Σε ασθενή με τραυμα και σιγμοειδεκτομή , σπληνεκτομή και τελική μόνιμη κολοστομία λόγω καταστροφής/ρήξης περινέου. μετά από 10 μέρες open abdomen (ABTHRETA) και re look laparotomy εξετάζεται το ενδεχόμενο σύγκλεισης της κοιλιάς με χασμα 16εκ. Ποια είναι η καλύτερη επιλογή
- Α. Anterior component separation
- Β. Προσωρινή σύγκλειση με vicryl πλεγμα και αντιμετώπιση σε 6 μήνες
- Γ. Posterior Component with TAR
- Δ. Unilateral Anterior component separation

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ΕΥΧΑΡΙΣΤΩ



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Τραύμα (MSC in Emergency
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Εθνικό και Καποδιστριακό Πανεπιστήμιο
Αθηνών

- ΚΟΚΟΡΟΠΟΥΛΟΣ ΠΑΝΑΓΙΩΤΗΣ
- ΧΕΙΡΟΥΡΓΟΣ

FOR YOUR FIRST LOOPES

- (2.5xWD)/15 in magnification/ Through the lens better
- Average WD 40-45cm
- Field of view/ depth of field (maximize it)
- Intrapupillary distance stable.
- Weight (less is better)
- Combine it with light source (lightweight) more than 60.000 lumens brightness
- Two batteries. At least.

2.5x

ECG	Power	Working Distance	Field of View	Depth of Field	Black - Grey
2.5X - S	2.5x	340mm / 13,4 in	90mm / 3,5 in	80mm / 3,1 in	42gr - 48gr
2.5X - R	2.5x	420mm / 16.5 in	100mm / 3,9 in	90mm / 3,5 in	42gr - 48gr
2.5X - L	2.5x	500mm / 19,7 in	110mm / 4,3 in	110mm / 4,3 in	42gr - 48gr
2.5X - XL	2.5x	550mm / 21,7 in	125mm / 4,9 in	120mm / 4,7 in	42gr - 48gr

3.0x

ECG	Power	Working Distance	Field of View	Depth of Field	Black - Grey
3.0X - S	3.0x	340mm / 13,4 in	60mm / 2.4 in	60mm / 2.4 in	48gr - 52gr
3.0X - R	3.0x	420mm / 16.5 in	65mm / 2.6 in	80mm / 3,1 in	48gr - 52gr
3.0X - L	3.0x	500mm / 19,7 in	70mm / 2.8 in	90mm / 3.5 in	48gr - 52gr
3.0X - XL	3.0x	550mm / 21,7 in	75mm / 3 in	100mm / 3.9 in	48gr - 52gr

3.5x

ECG	Power	Working Distance	Field of View	Depth of Field	Black - Grey
3.5X - S	3.5x	340mm / 13,4 in	55mm / 2.2 in	50mm / 2 in	52gr - 55gr
3.5X - R	3.5x	420mm / 16.5 in	60mm / 2.4 in	55mm / 2.2 in	52gr - 55gr
3.5X - L	3.5x	500mm / 19,7 in	65mm / 2.6 in	60mm / 2.4 in	52gr - 55gr
3.5X - XL	3.5x	550mm / 21,7 in	70mm / 2.8 in	65mm / 2.6 in	52gr - 55gr