

History of The Planned Open Abdomen from 1876 to 2016

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Disclaimer:

This presentation is not supported by any commercial entity in general nor any pharmaceutical or medical device business. My only bias is that I am the inventor of the artificial bur fascia prosthesis.



Acknowledgment of Surgeons involved and Places where this work was done



Altona General Hospital
University of Hamburg



C Aprahamian



RE Condon



M. Schein



Medical College of
Wisconsin

Wendt EC. 1876

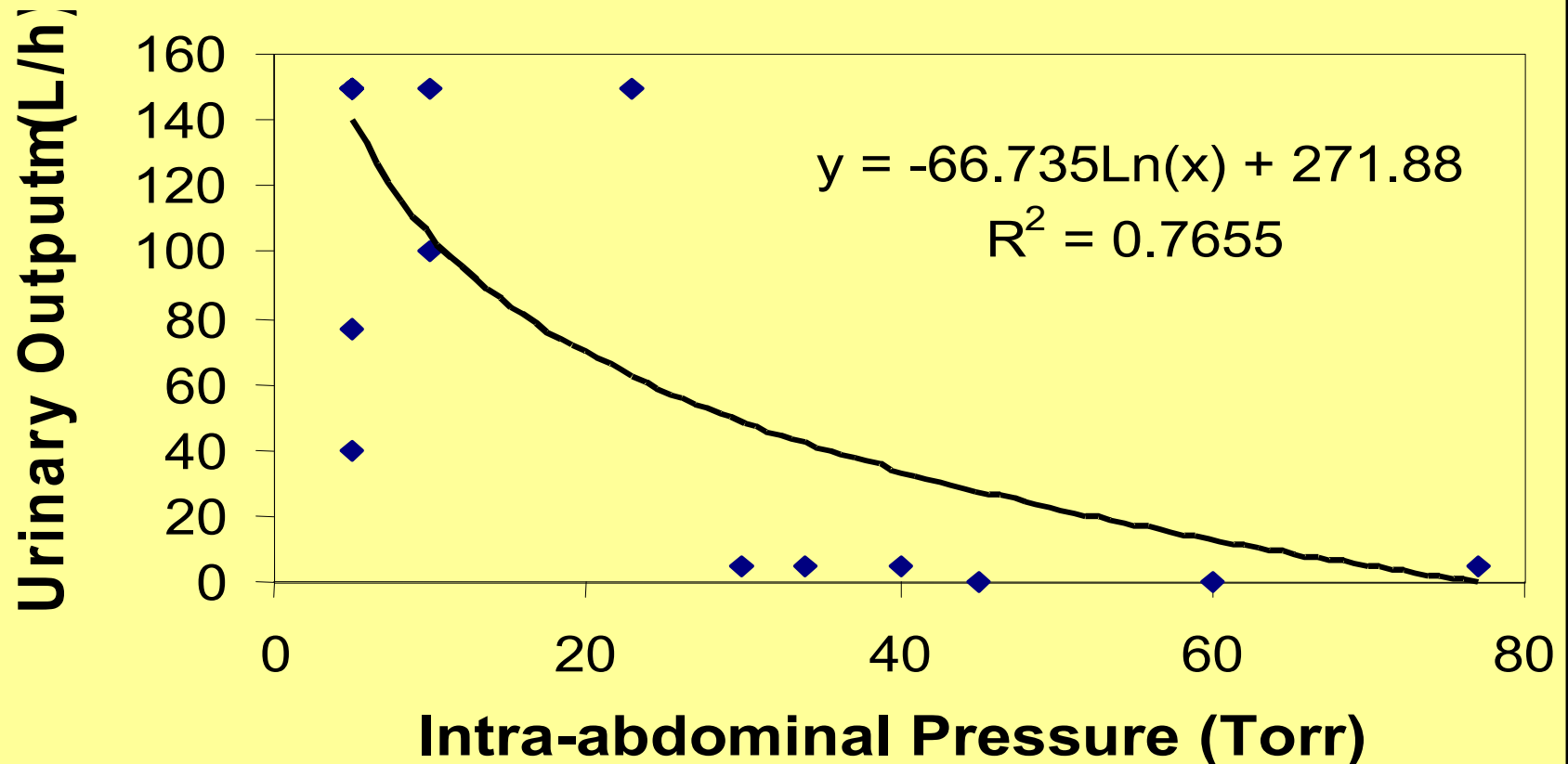
Über den Einfluß des intraabdominellen Druckes auf die Absonderungsgeschwindigkeit des Harnes.

Arch Heilkunde.17(1876)p 527

Wendt noted reduced urinary flow in the presence of

ABDOMINAL HYPERTENSION.

Correlation between Intra-abdominal Pressure and Urinary Output



Ref.: Schein, Wittmann et al.: J Am College of Surg 180(1995) 745-753

Mortality of Intra-abdominal Infections 1889-1899

1889 – 1899 (Data from Sudek, Arch Klin Chir)



Nötzel W. 1908

Die operativer Behandlung der diffusen eitrigen Peritonitis
Verhandlungen der Dtsch Gesellschaft für Chirurgie.
1908;34:638-707.

Nötzel W. noted in
1908 when treating
peritonitis operatively

“...and then there is
enormous pressure
increase”

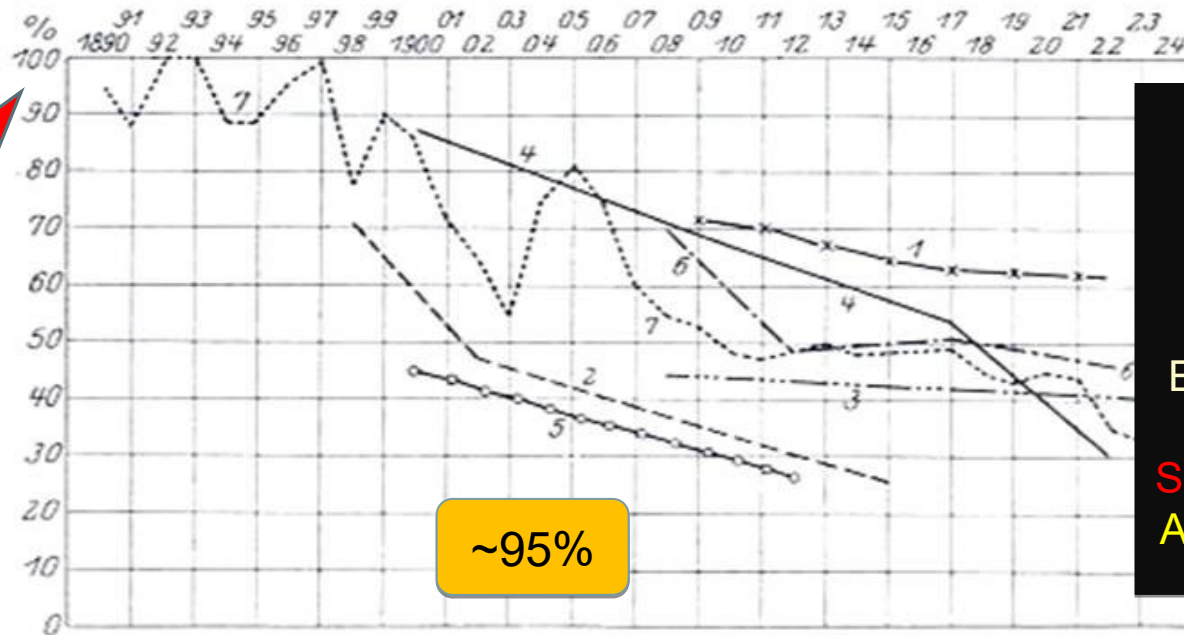
that often precluded
abdominal closure



Photo of a case with bowel herniation 70 years later

Mortality reduction during introduction of operative therapy of peritonitis in 7 hospitals from 1889 to 1925 (n= 5468) Langenb Arch Chir 142(1926)53-267

In 1889 there was no effective therapy and Mortality was 95%



1926

Operative Therapy reduced mortality to <45% and Experience led to the Surgical dogma: Always Close...

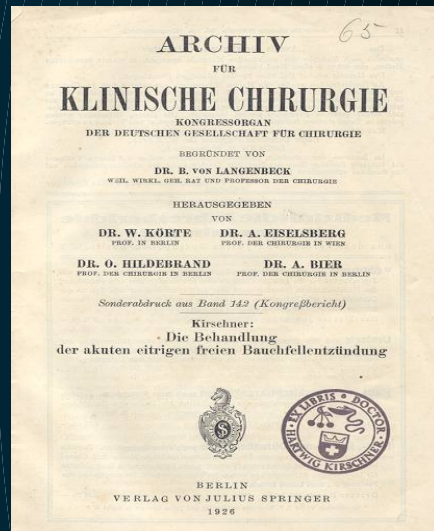
~95%

Tab. 18. Sterblichkeit 7 verschiedener Kliniken zu verschiedenen Zeiten (5468 Fälle).

1. Braun, Zwickau.	×—×—×	5. Körte, Berlin.	○—○—○—
2. Heidenhain, Worms.	— — — — —	6. Schöne, Stettin.	· — · — · —
3. Kappis, Hannover.	— · · · — · · ·	7. Sudeck, Hamburg.	· · · · · · · ·
4. Kirschner, Königsberg.	— — — — —		

...and respect an intact abdominal envelope to prevent gut perforation and fistulas because.....

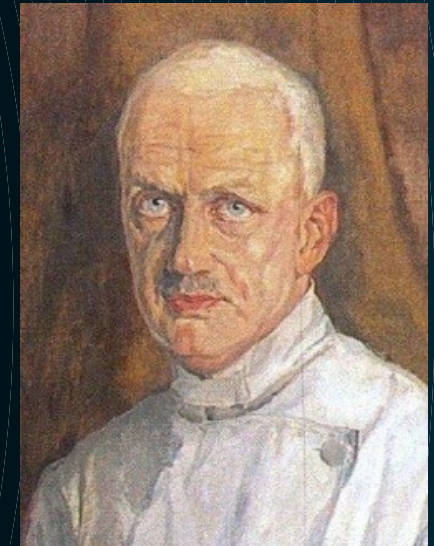
Lessons from experience with operative management
summarized by M Kirschner in 1926 and published in
Langenb Arch Chir 142(1926)53-267



1926

Defining fundamental Principles for operative management of the infected abdominal cavity

- SOURCE CONTROL
- RISK ELIMINATION
- SYSTEM SUPPORT
- ALWAYS CLOSE



Martin
Kirschner

Four Principles of Surgical Therapy

Source Control:

Close the source of infection. (Verstopfen der Infektionsquelle)

Risk Elimination

Mechanically: Eliminate necroses, adjuvants, bacteria and toxins
(Wash out)

Chemically: Use antimicrobials, antitoxins (1923 !)

System Support

Fluid resuscitation, Intensive care Respiratory support Nutrition

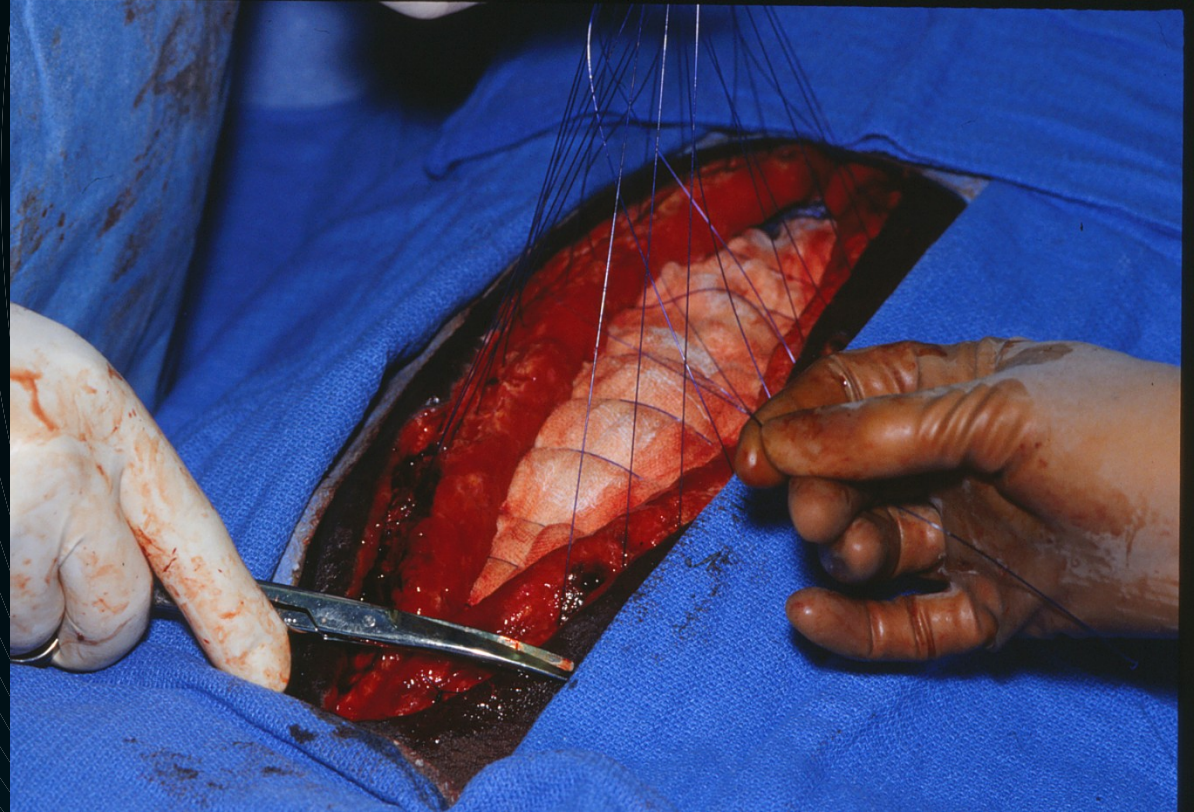
Always Close the Abdomen

Leaving the abdomen open in the absence of effective antimicrobial treatment leads to fulminant necrotizing infections of the abdominal wound

SURGICAL DOGMA up to 1975 always close the abdomen

Early experience
with a planned
open abdomen led
to the conclusion:

**always close
the abdomen !**

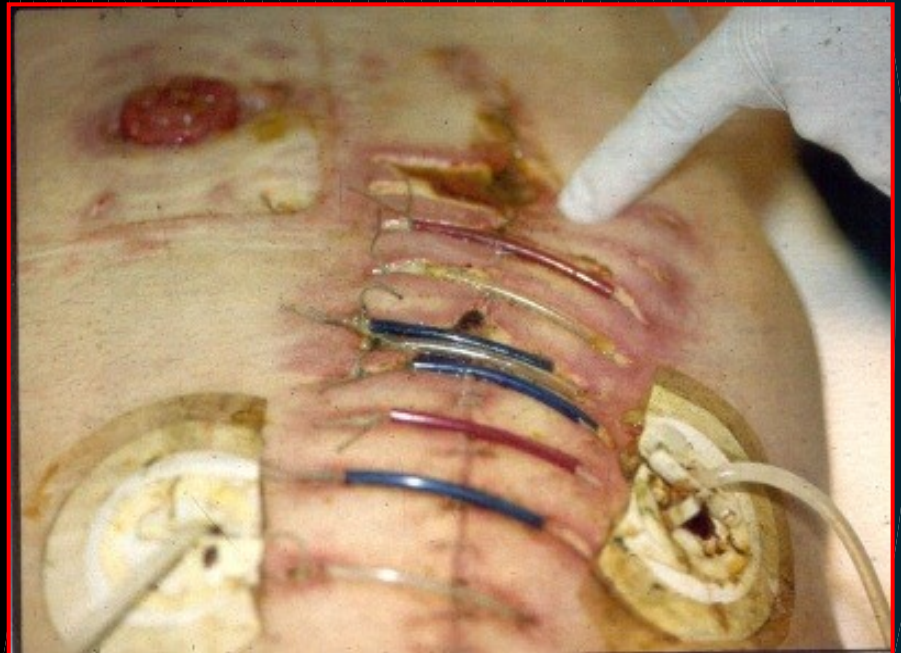


Problems with the Implementation of the Surgical Dogma the abdomen must be closed



1976

General Hospital Hamburg Altona



1992

Kenosha General Hospital to
Milwaukee County Hospital

Research about intra abdominal pressure

1911

Emerson, H.

Intra-abdominal pressures.

Arch. Intern. Med., 1911, 7: 754-784

1926

Wagner, G. W.

Studies on intra-abdominal pressure.

Am. J Med., 1926, 171: 697-707.

1931

Overholt, R. H.

Intraperitoneal pressure.

Arch Surg., 1931, 22: 691-703.



1936 STRAUSS, Chicago

Planned open abdomen using a zipper

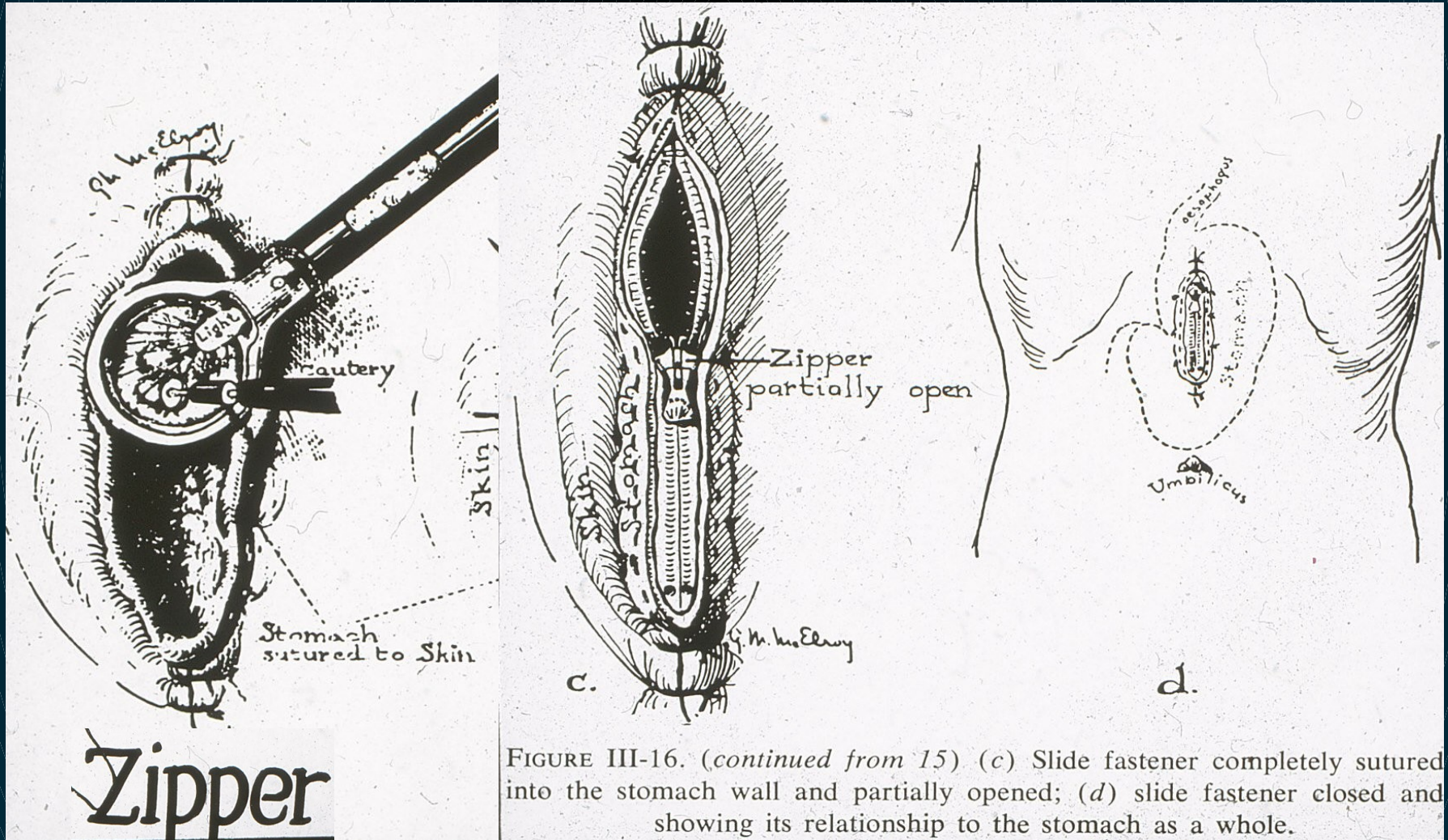


FIGURE III-16. (continued from 15) (c) Slide fastener completely sutured into the stomach wall and partially opened; (d) slide fastener closed and showing its relationship to the stomach as a whole.

1978 Cannot Close the Abdomen



- ACS was not defined
- “Always Close” DGMA prevailing



Braking the dogma

Planned Open Abdomen revisited

In his dissertation a young physician proposes to simply leave the abdomen open and
hopeless cases survived, which triggered renewed research....



1975 Paris, Pujol

Pujol JP. La non fermeture des incisions abdominales d'urgence. Techniques et résultat. Paris: These pour le Doctorat en Medicine, Université Pierre et Marie Curie Paris VII, faculté de Medicine Saint Antoine; 1975.

Source Control:

Close the source of infection. (Verstopfen der Infektionsquelle)

Threat Elimination:

Eliminate necroses , adjuvants, bacteria and toxins mechanically
(Wash out)
and chemically antimicrobials, antitoxins

System Support

Fluid resuscitation, Intensive care Respiratory support Nutrition

Always Close the Abdomen

Laving the abdomen open in the absence of effective antimicrobial treatment les do fulminant necrotizing infections of the abdominal wound

Planned Open Abdomen reinvented

Abdominal compartment syndrome

Their universal experience was:

Hopeless cases of advances peritonitis survived when the abdomen was simply left open reversing system failure from high pressure.



Principles of Operative Therapy

Source Control:

Close the source of infection. (Verstopfen der Infektionsquelle)

Threat Elimination:

Eliminate necroses , adjuvants, bacteria and toxins
mechanically (Wash out)
and chemically antimicrobials, antitoxins

System Support

Fluid resuscitation, Intensive-care Respiratory support Nutrition

Decompression

Reverse sequence to multiple organ failure
by decompressing abdominal compartment syndrome

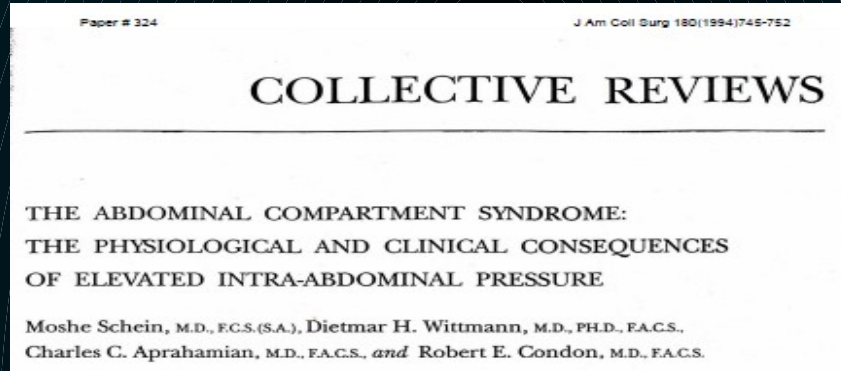
Planned open abdomen: early publications

Explosion of advanced procedures and terminology confusion

- La non fermeture des incision abdominales, Pujol, 1975, ⁶; La paroi ouverte, chirurgie iterative, Fagniez, 1978, ⁷; Les ventres laissez ouverts, Hay, 1979, ^{8,9}; Evisceration therapeutique controllée in so-called "terminal" peritonitis, Dupre, 1979, ¹⁰; Open Abdomen, Steinberg, 1979, ¹¹; La non fermeture parietale dans la chirurgie iterative des peritonites, Champault, 1979, ¹²; L'éviscération couverte, Fangs, 1979, ¹³; La non fermeture parietale dans la chirurgie iterative, Guivarch, 1979, ¹⁴; L'éviscération ouverte et jupe plastique, Neidhardt, 1979, ¹⁵; Oglivie Method, Goris, 1980, ¹⁶; Open peritoneal drainage, Maetani, 1981, ¹⁷; Leaving abdomen open, Duff, 1981, ¹⁸; das offen gelassene Abdomen, Hollender, 1983, ¹⁹; Planned Relaparotomy, Penninckx, 1983, ^{20,21}; Open Packing, Anderson, 1983, ²²; Open Treatment of abdominal catastrophies, Broome, 1983, ²³; Semiopen Abdomen, Wouters, 1983, ²⁴; Gravity Drainage, Vasquez, 1983, ²⁵; Open Drainage, Bradley, EL, 1984, ²⁶; Open Packing, Stone, 1984, ²⁷; Medial Myocutaneous Advancement, Levi, 1985, ^{28,29}; Programmierter Peritoneallavage, Muhrer, 1985, ³⁰; Controlled Open Drainage, Bradly, SJ, 1985, ³¹; Nichtzuhnähen der Bauchöhle, Jonecko, 1986, ³²; Open lesser sac drainage, Pemberton, 1986, ³³; Open Management, Heddrich, 1986, ³⁴; Planned Reoperation, Andrus, 1986, ³⁵; Open treatment, Bytka, 1986, ³⁶; Etappenlavage, Teichmann, 1986, ³⁷; Laparostomy, Mughal, 1986/7, ^{38,39}; Polypropylene mesh closure, Chan, 1986, ⁴⁰; Open Management, Bradley, EL, 1987, ⁴¹; Zipper-mesh Technique of open abdomen Garcia-Sabrido, 1985/88, ^{42,43}; the Mesh Marlex and Zipper Technique Walsh, 1988, ⁴⁴; Open Abdomen, Ivaturi, 1989, ⁴⁵; Open Abdomen, Cruz, 1989, ⁴⁶; Sequential abdominal Reexploration, Cuesta, 1991, ⁴⁷; Open Abdomen + Planned relaparotomy, Schein, 1991, ⁴⁸; Open Abdomen, Bose, 1991, ⁴⁹; Savino, 1991, ⁵⁰; Temporary abdominal closure, Hannon, 1992, ⁵¹; Retroperitoneal Laparostomy; VanVyve, 1992, ⁵²; STAR Staged abdominal Repair, Wittmann, 1990, ^{53,54}; Open-Closed Technique Vauthey, 1993, ⁵⁵.

Ref: Eur Surg 32(2000)171 and www.openabdomen.org

Abdominal Compartment Syndrome (ACS)



First comprehensive Publication about ACS : 1994

Schein M, Wittmann DH, Aprahamian, CA, Condon RE: The abdominal compartment syndrome: The physiological and clinical consequences of elevated intra-abdominal pressure. J Am Coll Surg 180:745-753, 1994



M. Schein MD, Fellow Surgical Critical Care Program , MCW

Abdominal Compartment Syndrome (ACS)

Pathophysiologic Impairments

as summarized in J Am College of Surg 180(1995) 745-753

Abdominal wall compliance = Ref 53

Cardiovascular = (17 pubs) ; Cardiac output = (5 pubs) REF 9 14 37 58 56

Increased systemic vascular resistance = REF 10 11 14 35 38 41 50 53 54 55 56 57 13

Venous return - preload = (16 pubs): REF 7 8 10 11 14 35 37 38 41 43 45 47 54 55 58

Hepatic Blood Flow = (6 pubs): REF 5 14 41 60 61 62

Visceral blood flow = (5 pubs): REF 12 14 37 63 64

Abdominal veins and lymphatics = (6 pubs): REF 41 44 46 63 65 66

Renal Function = (15 pubs): REF 10 13 15 16 17 18 19 20 21 22 47 53 54 67 68

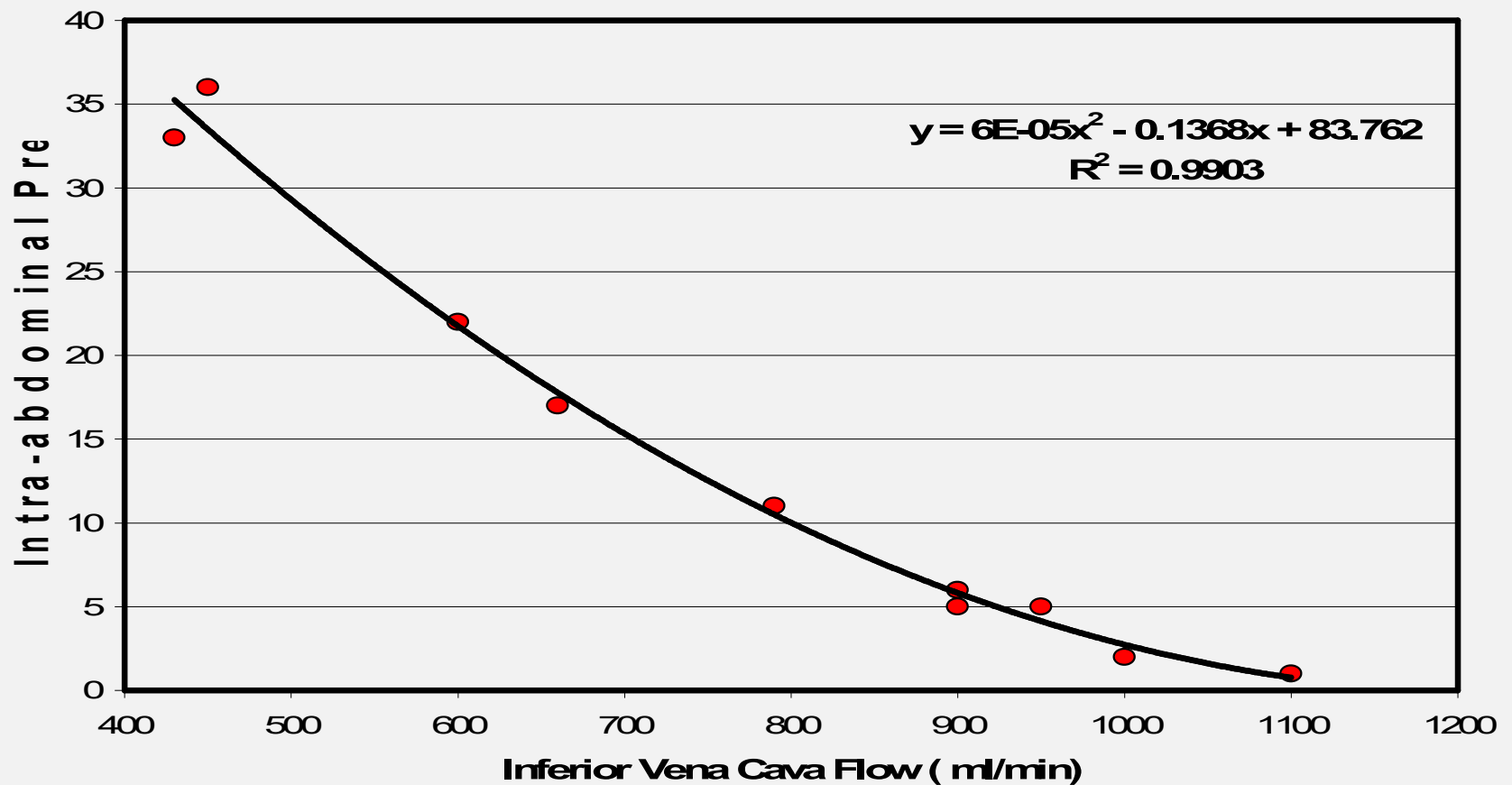
Pulmonary functions pulmonary vascular resistance = (9 pubs) REF 8 9 17 18 37 39 50 53 55

Laparoscopy = REF 63 64

INFERIOR VENA CAVA FLOW IS REDUCED WITH INVREASING INTRAABDOMINAL PRESSURE

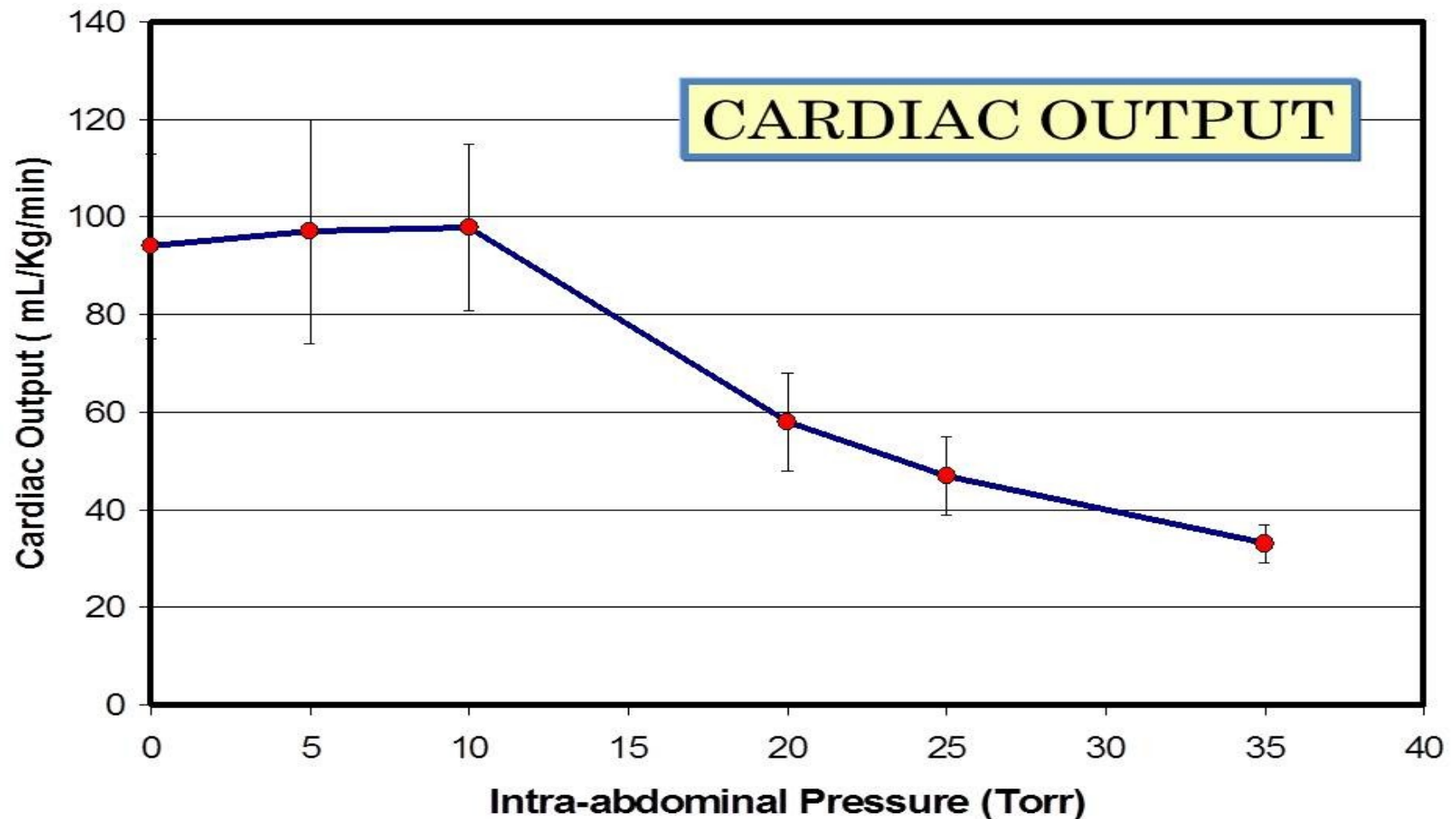
17 Ref in: J Am College of Surg 180(1995) 745-753

Intra-abdominal Pressure and Inferior Vena Cava Flow



CARDIAC OUTPUT IS REDUCED WITH INCREASING INTRAABDOMINAL PRESSURE

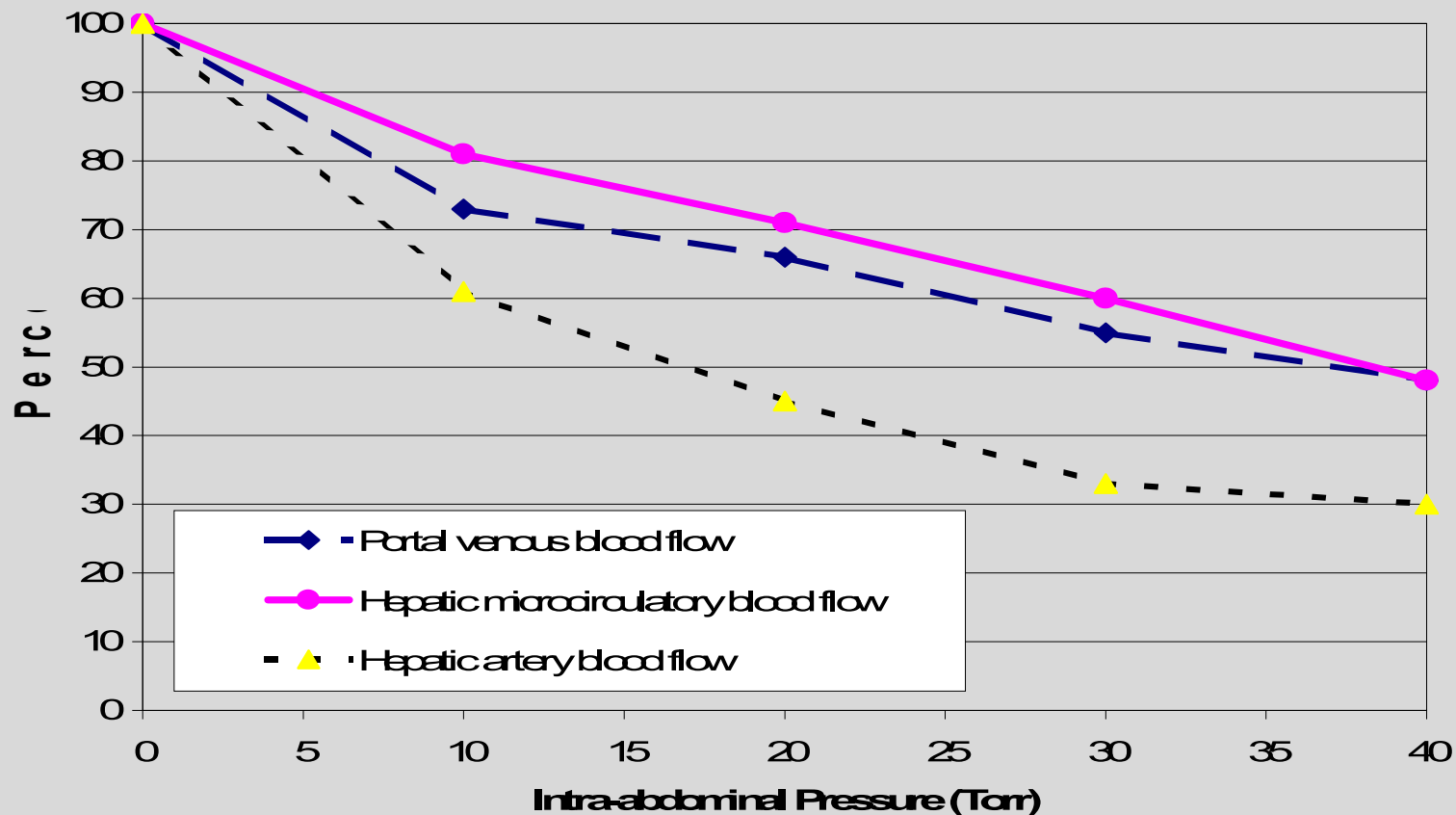
5 Ref in: J Am College of Surg 180(1995) 745-753



HEPATIC BLOOD FLOW IS REDUCED WITH INVREASING INTRAABDOMINAL PRESSURE

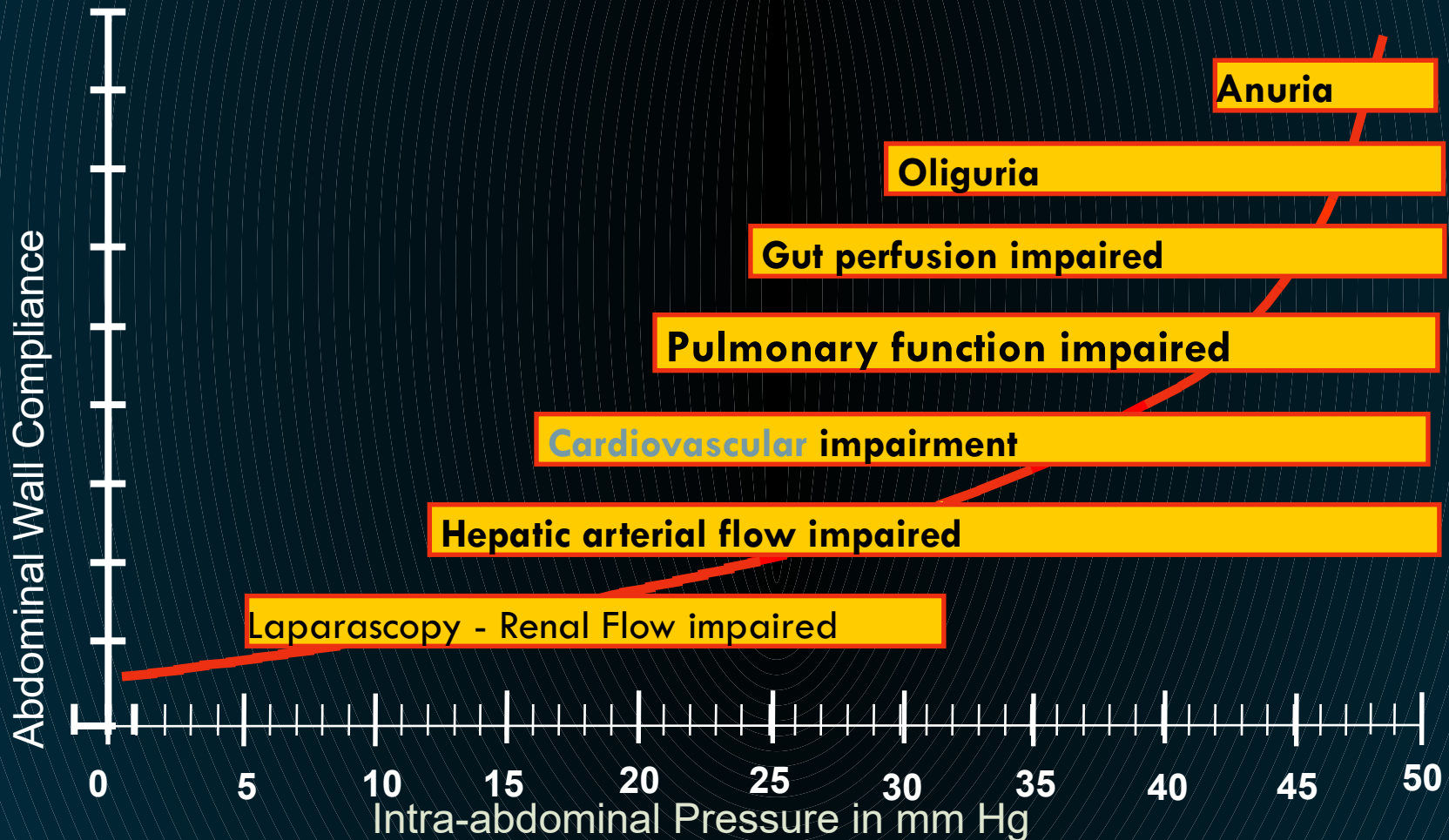
6 Ref in: J Am College of Surg 180(1995) 745-753

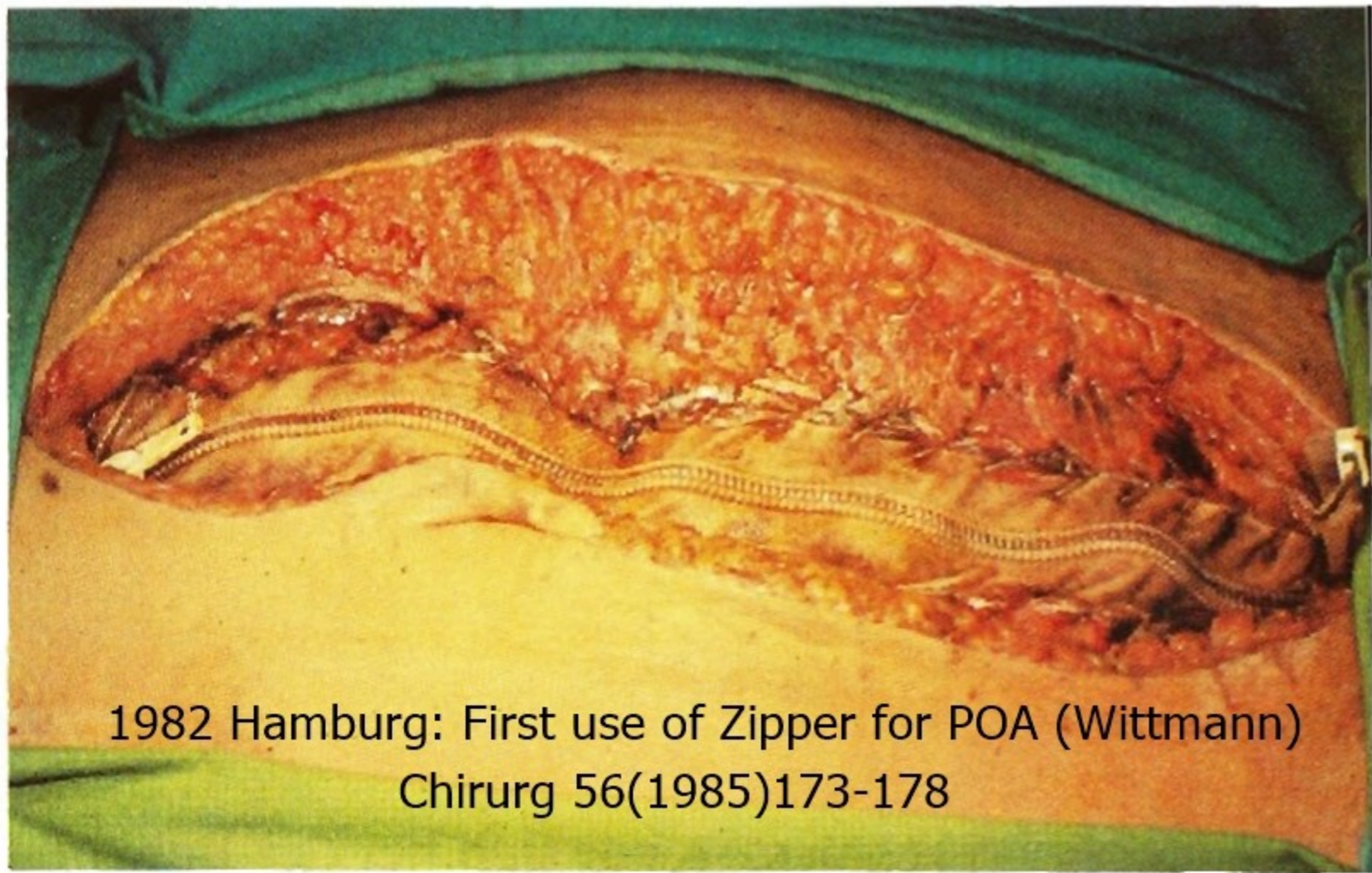
Hepatic Blood Flow and Intra-abdominal Pressure



Abdominal compartment syndrome = ACS

Functional Impairment & Abdominal Wall Compliance





1982 Hamburg: First use of Zipper for POA (Wittmann)
Chirurg 56(1985)173-178

1984

Chirurg (1985) 56: 173-178

Chirurg 56(1985)173-178

142

Der Reißverschluß als neue Methode
des temporären Bauchdeckenverschlusses in der Abdominalchirurgie*

1986

Scheduled Reoperations (Etappenlavage)
for Diffuse Peritonitis Arch Surg 212(1986)147-151

1990

Etappenlavage: Advanced Diffuse Peritonitis Managed by Planned Multiple
Laparotomies Utilizing Zippers, Slide Fastener, and Velcro® Analogue for
Temporary Abdominal Closure



World J Surg 14(1990) 218-226

1990

THE JOURNAL OF TRAUMA
Copyright © 1990 by The Williams & Wilkins Co.

J Trauma 30(1990)719-723

Vol. 30, No. 6
Printed in U.S.A.

Temporary Abdominal Closure (TAC) for Planned
Relaparotomy (Etappenlavage) in Trauma

1993

Eur J Surg 159: 75-79, 1993

Eur J Surg 75(1993)75-79

A BURR-LIKE DEVICE TO FACILITATE TEMPORARY ABDOMINAL CLOSURE IN
PLANNED MULTIPLE LAPAROTOMIES

1994

Theor Surg (1994) 9:201-207

Theoretical Surg 9(1994)201-207

Theoretical
Surgery
© Springer-Verlag 1994

Staged abdominal repair compares favorably
with conventional operative therapy for intra-abdominal infections
when adjusting for prognostic factors with a logistic model

1996

REVIEW ARTICLE

ANNALS OF SURGERY
Vol. 224, No. 1, 10-18
© 1996 Lippincott-Raven Publishers

Ann Surg 225(1996) 10-18

Management of Secondary Peritonitis

2000

Acta Chir. Austriaca - Vol. 32 - No 4 - 2000

171

Acta Chir Austriaca 32(2000) 171-178

From the Department of Surgery, Medical College of Wisconsin, Florida, USA

Staged Abdominal Repair: Development and Current
Practice of an Advanced Operative Technique for Diffuse

Planned Open Abdomen: Useful Terminology

STATIC Procedures

- **OPEN COELOSTOMA**
open abdomen
- **MESH COELOSTOMA**
covering the gap with a mesh
- **BOGOTA COELOSTOMA**
covering with plastic drape
- **VAC COELOSTOMA**
plastic drape over hypobaric wound

DYNAMIC Procedure

- **DNS Coelostoma**
Dynamic Retention Sutures to temp close
- **ZIPPER Coelostoma**
commercial zipper
- **ETHIZIP Coelostoma**
slide fastener to temp close
- **Bur Patch Coelostoma**
Artificial Bur fascia prosthesis

Planned open abdomen

Useful terminology

STATIC Procedures

- All OPEN abdomens without active re-approximation of the fascia

DYNAMIC Procedures

- All open abdomens with active re-approximation of the fascia

Terminology

Open abdomen and 57 more names are used

All inclusive terms

Laparostomy – Laparostoma

Coelostomy – Coelostoma

Abdominostomy -Abdominostoma

COMMON DENOMINATOR:

Stoma (opening) of the coelom (abdomen)

The Planned Open Abdomen
(POA)

- Open coelostoma
- Mesh coelostoma
 - Marlex coelostoma
 - Gortex coelostoma
 - VAC coelostoma
- DRS Dynamic Retentions Suture
- Ethizip coelostoma
- Divided mesh
- Bur patch fascia prosthesis

Static

Dynamic

Braking the dogma

Planned Open Abdomen revisited

In his dissertation a young physician proposes to simply leave the abdomen open and
hopeless cases survived, which triggered renewed research....



1975 Paris, Pujol

Pujol JP. La non fermeture des incisions abdominales d'urgence. Techniques et résultat. Paris: These pour le Doctorat en Medicine, Université Pierre et Marie Curie Paris VII, faculté de Medicine Saint Antoine; 1975.

....missing counter pressure in the area of an open abdomen (coelostoma) results in fistulae

Factors leading to fistula

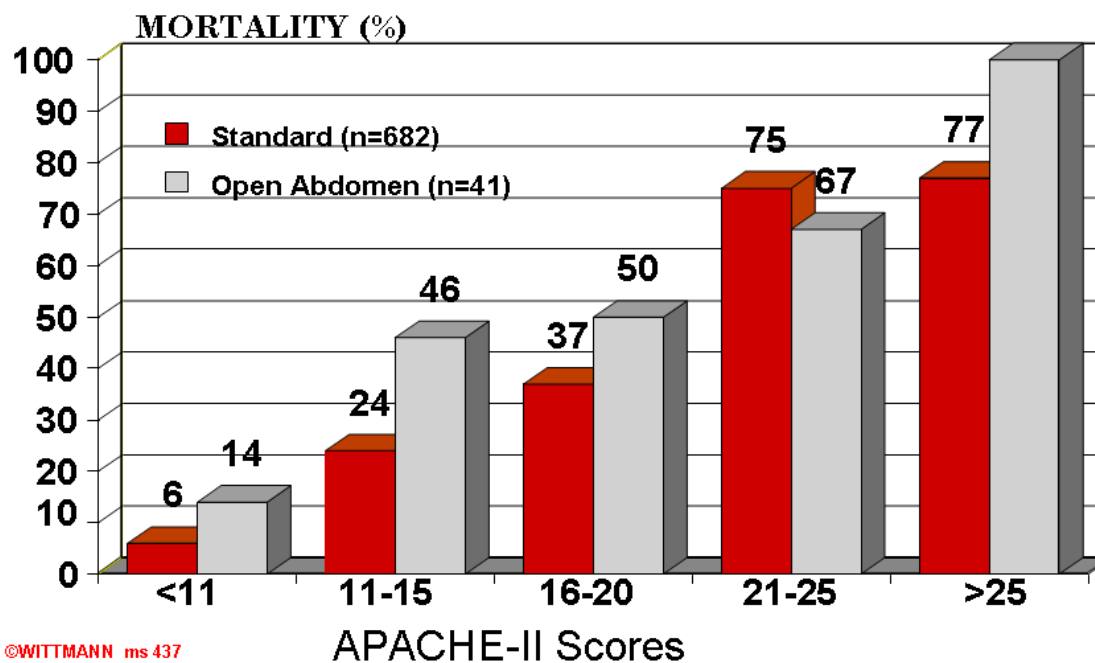
- No counter pressure
- Ileus
- Inflammation
- Friable bowel
- Edema
- Surgical trauma



Fistula – an open mucocutaneous tract, difficult to manage

Comparison of Standard Operative Management with Open Abdomen

(Data: World J Surg 15;537,199, and Problems in General Surgery, 10:604-627, 1993)



How to decide about the best option?

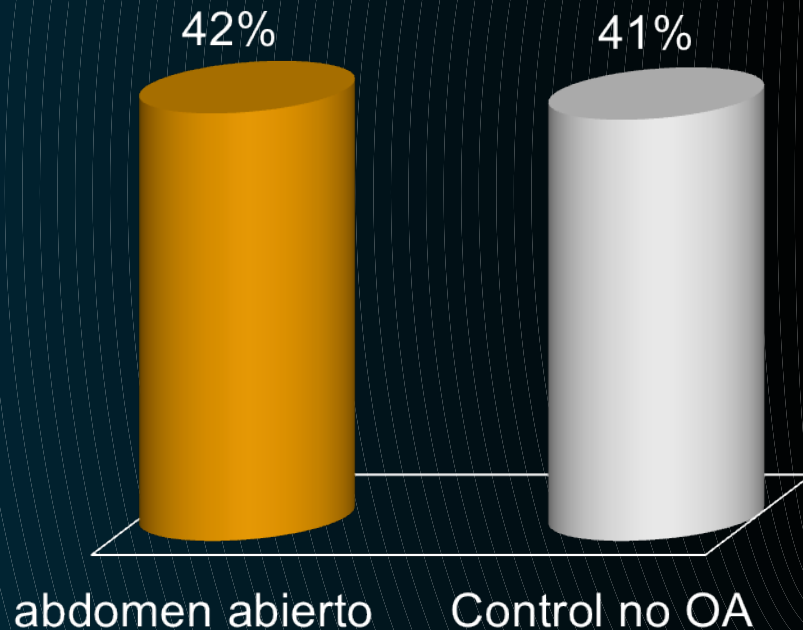
- Analysis of 126 studies that provide useful information when combined:

• Series I (2329 cases in 69 studies)	studies	cases
• Open abdomen without mesh	37	869
• Open abdomen with mesh/zipper	12	439
• OA with Vacuum Pack	8	508
• STAR like operations	11	385
• STAR by definition	1	128

- **Series II** (3169 cases in 57 Studies)

World J Surg 33(2009)199 Eur Surg 32(2000)171 and www.openabdomen.org

MORTALITY of Open Coelostomy versus control (series I)



Mortality reported for open coelostoma (n=869) and control groups (n=290)

	Studies	Patients	DIED	
Technique	(n)	(n)	(n)	Ratio
Open	37	869	362	41.7%
Control group*		195	76	39.1%
Mesh	12	439	171	38.9%
No controls				
STAR	11	385	108	28.1%
Control group*	1	95	43	44.2%
All	60	1983	760	

1998

Ref: Eur Surg 32(2000)171 and www.openabdomen.org

How to improve outcome of the uncovered open abdomen?

- Cover the fascial gap ?
- Use a fascia prosthesis ?
- Apply counter pressure ?
- Forcefully close ?

Planned Open Abdomen

Useful Terminology

STATIC Procedures

- **OPEN COELOSTOMA**
open abdomen
- **MESH COELOSTOMA**
covering the gap with a mesh)
- **BOGOTA COELOSTOMA**
covering with plastic drape
- **VAC COELOSTOMA**
pastic drape over hypobaric wound

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Dynamic Retention Sutures to temp close
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commercial zipper
- **ETHIZIP Coelostoma**
slide fastener to temp close
- **Bur Patch Coelostoma**
Artificial Bur fascia prosthesis

Bogota Bag

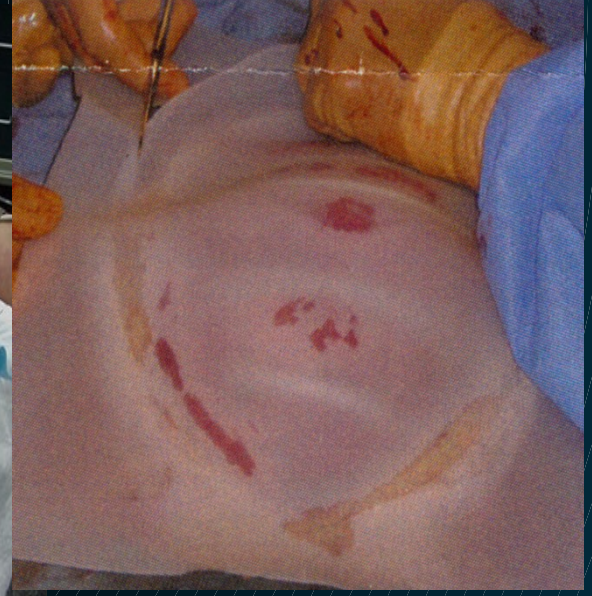
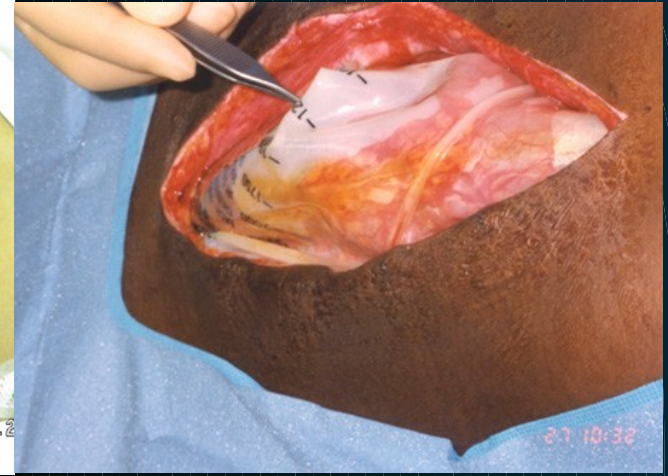
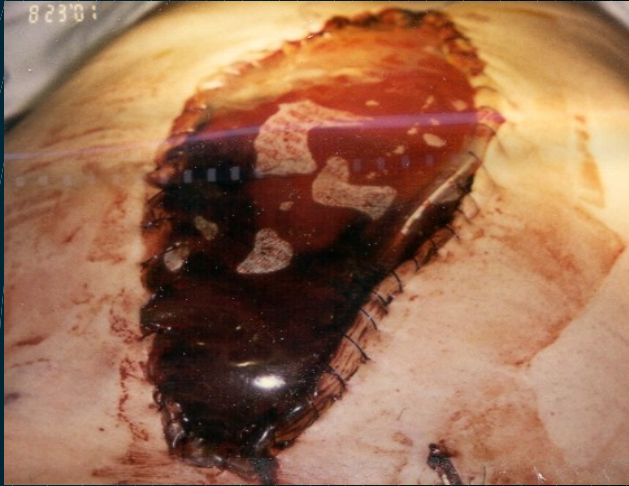
Andy J. Martínez Morales, MPH

University of Puerto Rico - School of Medicine *Class of 2011*



A Bogota Bag is a sterile plastic bag used for closure of an abdominal wound. Its use was first described in **1984** by **Oswaldo Borráz** while a general surgery resident at the San Juan de Dios Hospital in Bogotá, Colombia.

Bogota Bag variations



Planned Open Abdomen

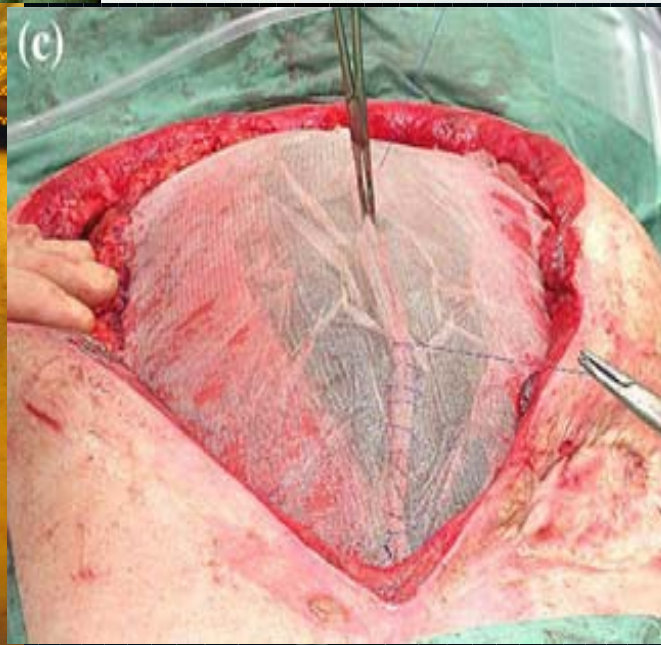
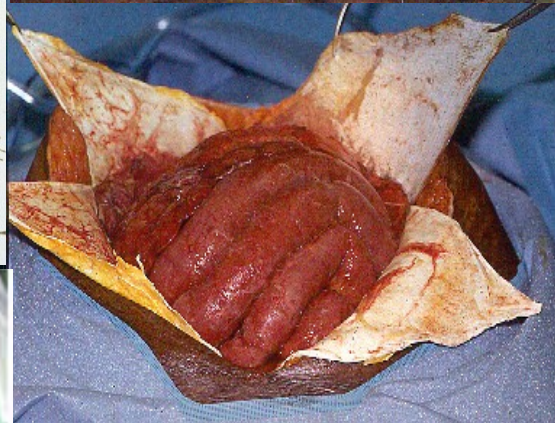
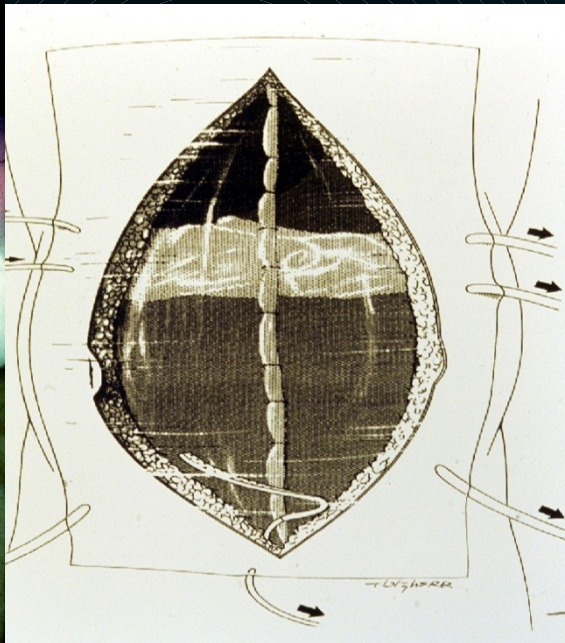
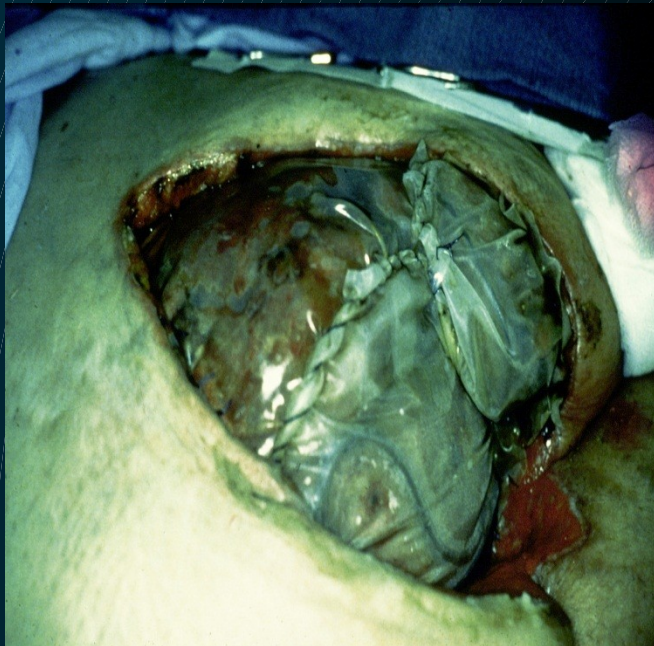
Useful Terminology

STATIC Procedures

- **OPEN COELOSTOMA**
 - open abdomen
- **BOGOTA COELOSTOMA**
 - covering with plastic drape
- **DIV. MESH COELOSTOMA**
 - covering the gap with a mesh)
- **VAC COELOSTOMA**
 - plastic drape over hypobaric wound

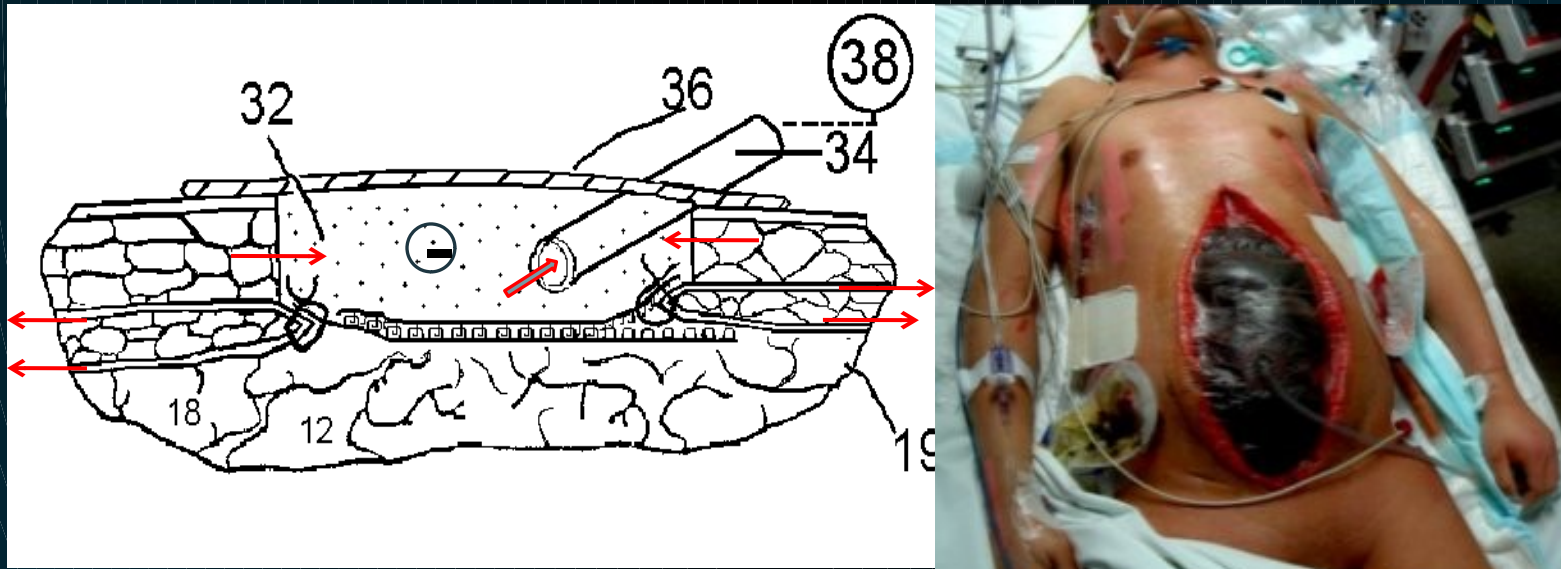
DYNAMIC Procedure

- **DNS Coelostoma**
 - Dynamic Retention Sutures to temp close
- **ZIPPER Coelostoma**
 - commercial zipper
- **ETHIZIP Coelostoma**
 - slide fastener to temp close
- **Bur Patch Coelostoma**
 - Artificial Bur fascia prosthesis



Vacuum-assisted closure (VAC™)

“...The negative pressure keeps constant tension on the fascial edges and excess fluid is collected...”



ALL STATIC PROCEDURES



STATIC Procedures
Procedimientos ESTATICOS



RESULTS

World J Surg 15(1998)537
Problems in General Surgery, 10(1993)604
World J Surg 33(2009)199
Eur Surg 32(2000)171

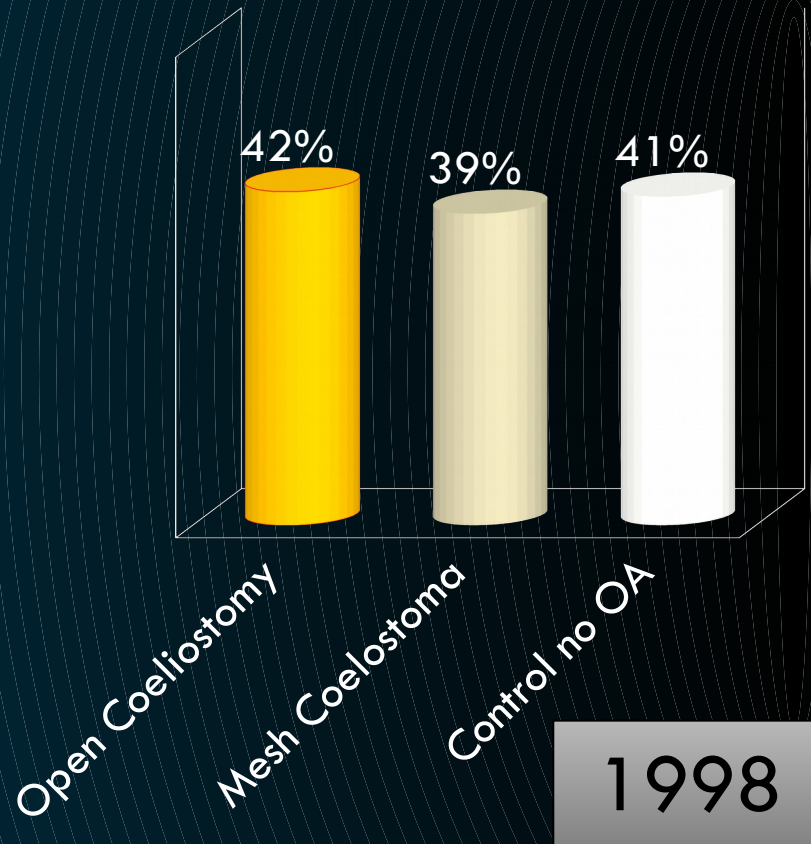
When surgeons started treating peritonitis operatively they were concerned about the **"enormous pressure increase"** that often precluded abdominal closure
Nötzel W. 1908

Die operative Behandlung der diffusen eitrigen Peritonitis Verhandlungen der Dtsch Gesellschaft für Chirurgie 1908;34:638-707.



MORTALITY

of Open Coelostomy versus control (series I)



1998

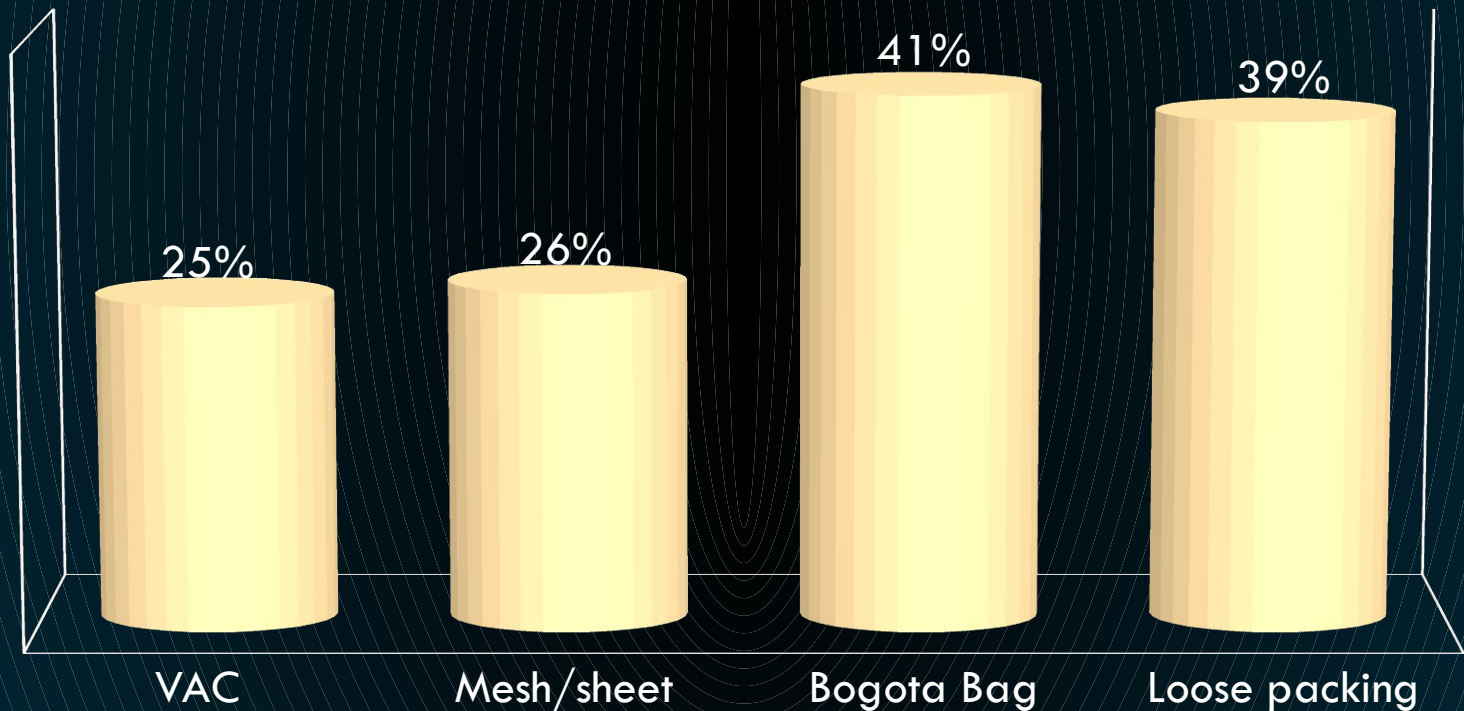
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Ref: Eur Surg 32(2000)171 and www.openabdomen.org

Mortality of VAC – MESH – ZIPPER coelostomy

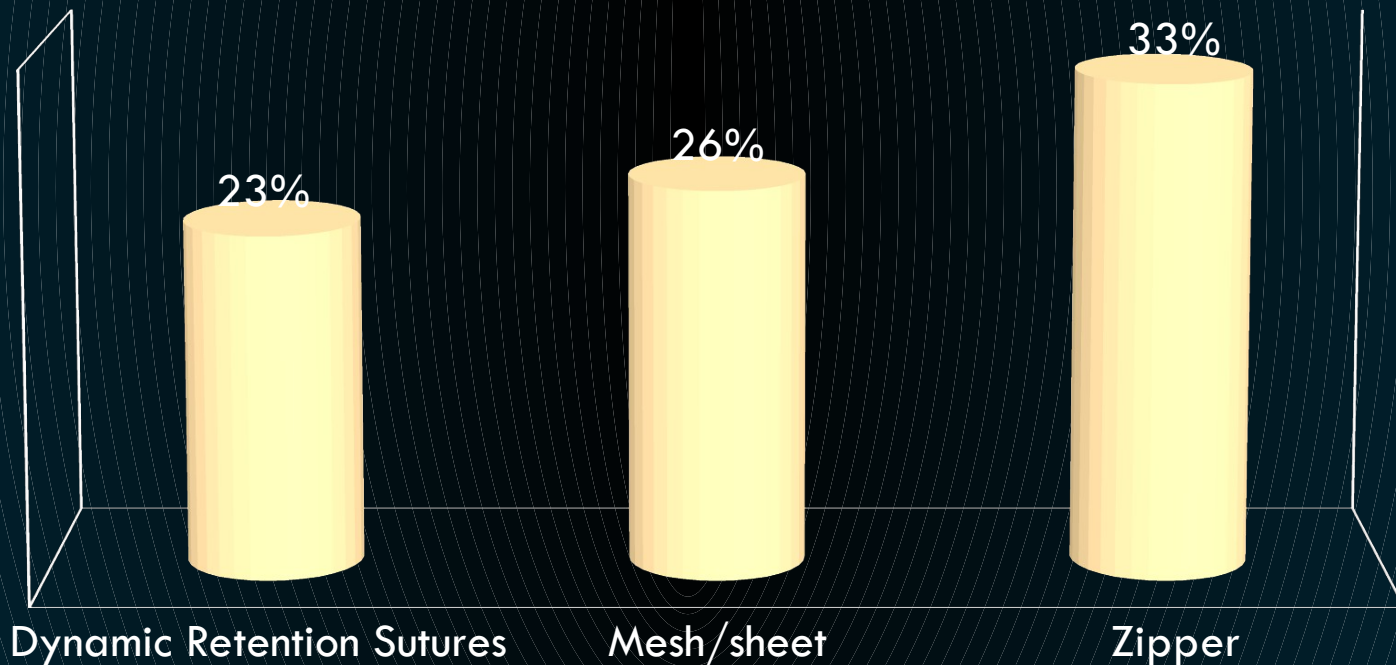
Series II, 2009



World J Surg 33(2009)199 (n=2329)

Mortality of VAC – MESH – ZIPPER coelostomy

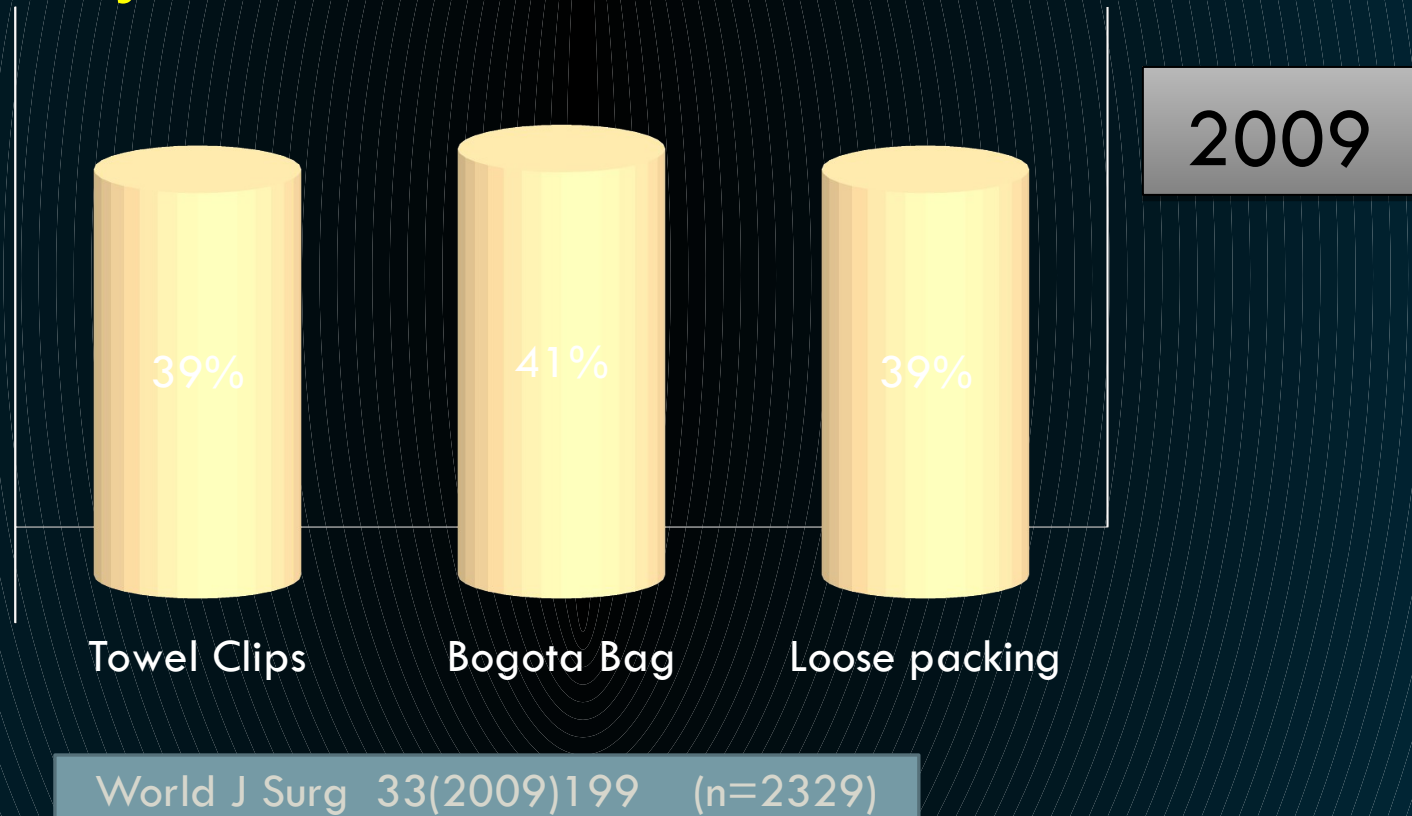
Series II, 2009



World J Surg 33(2009)199 (n=2329)

Temporary closure of the open abdomen: a systematic review on delayed primary fascial closure in patients with an open abdomen.

Mortality

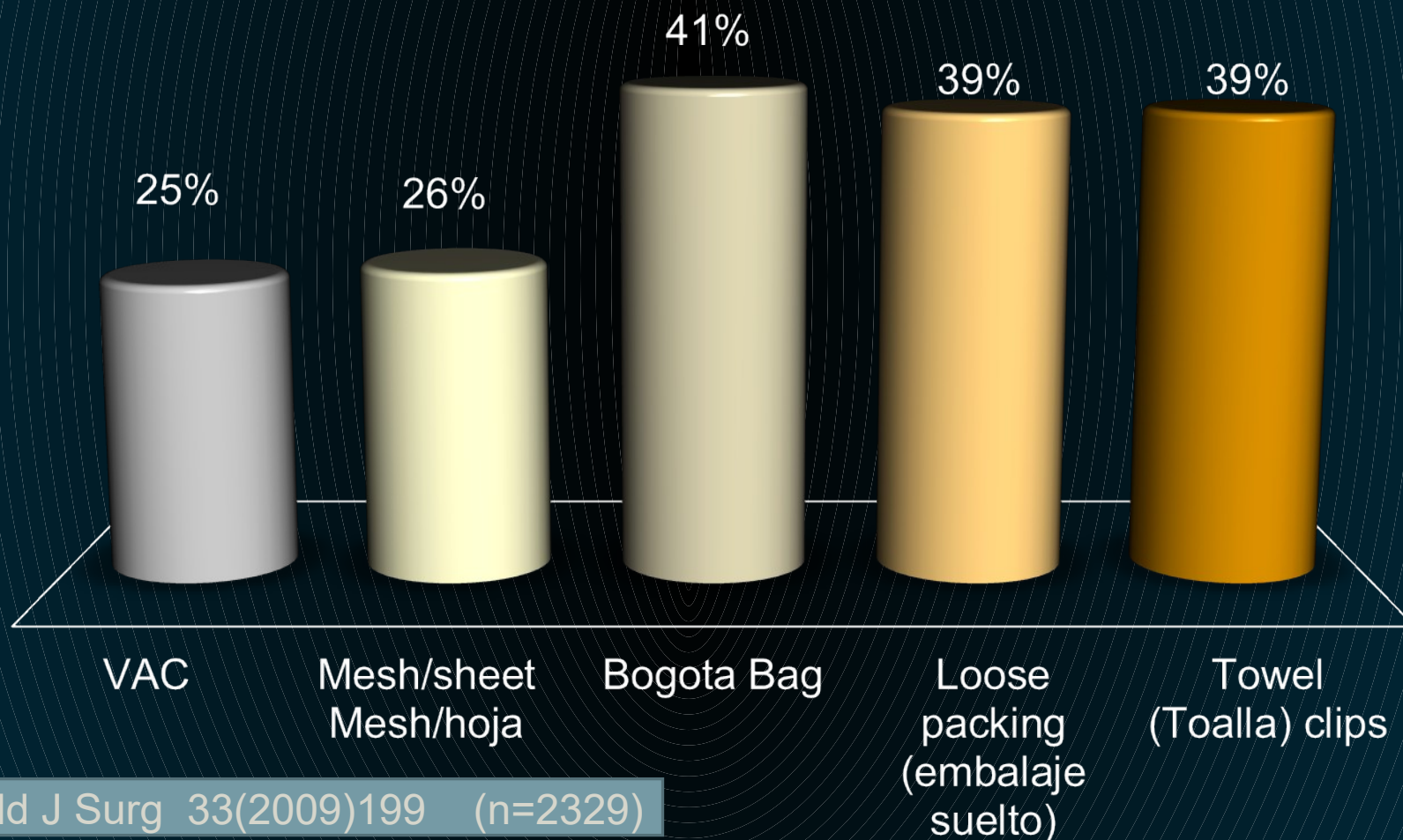


STATIC Procedures

Procedimientos ESTATICOS

Series II, 2009

Mortality - Mortalidad



World J Surg 33(2009)199 (n=2329)

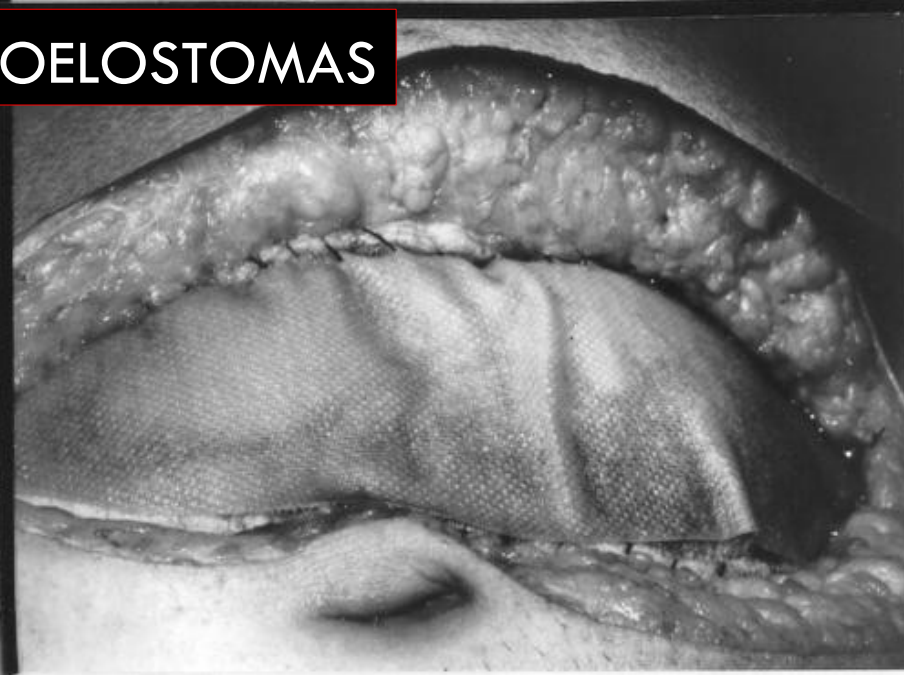
How to improve outcome of the uncovered open abdomen?



- Forcefully close ?
- **Apply counter pressure ?**
- Cover the fascial gap ?
- Use a fascia prosthesis ?
- **Re-explore daily**



DYNAMIC COELOSTOMAS



Planned Open Abdomen

Useful Terminology

STATIC Procedures

- **OPEN COELOSTOMA**
open abdomen
- **MESH COELOSTOMA**
covering the gap with a mesh)
- **BOGOTA COELOSTOMA**
covering with plastic drape
- **VAC COELOSTOMA**
plastic drape over hypobaric wound

DYNAMIC Procedure

- **DNS Coelostoma**
Dynamic Retention Sutures to temp close
- **ZIPPER Coelostoma**
commercial zipper
- **ETHIZIP Coelostoma**
slide fastener to temp close
- **Bur Patch Coelostoma**
Artificial Bur fascia prosthesis

1978 → retention suture today → dynamic retention suture

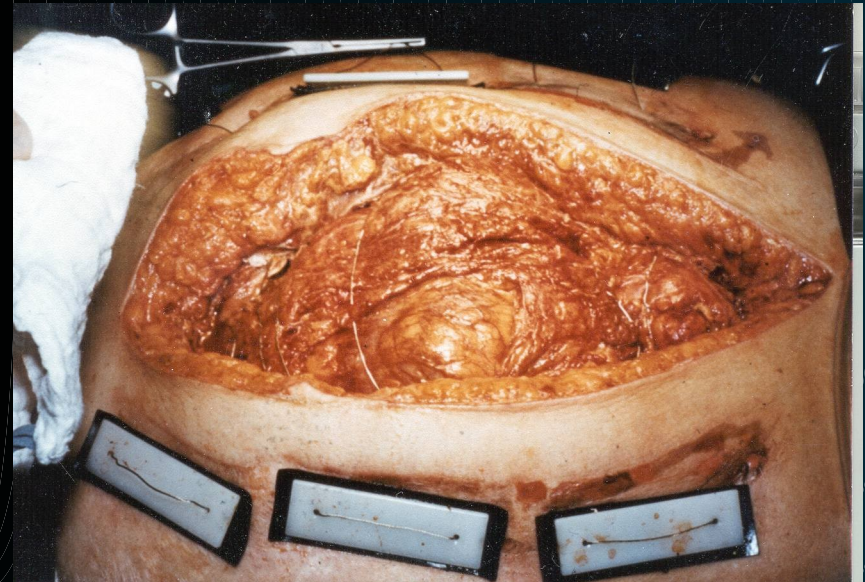
DYNAMIC RETENTION SUTURE (DRS)

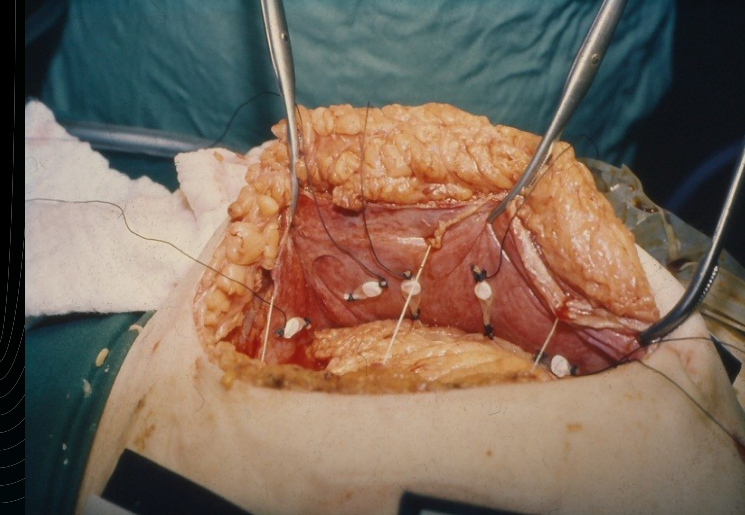
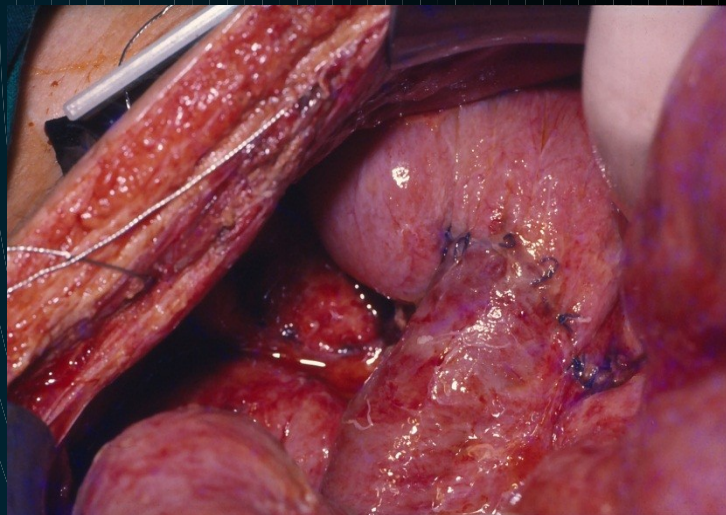
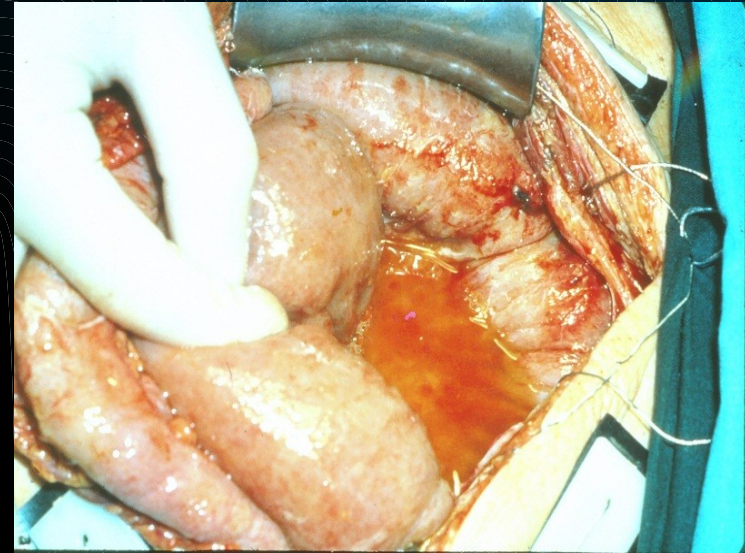
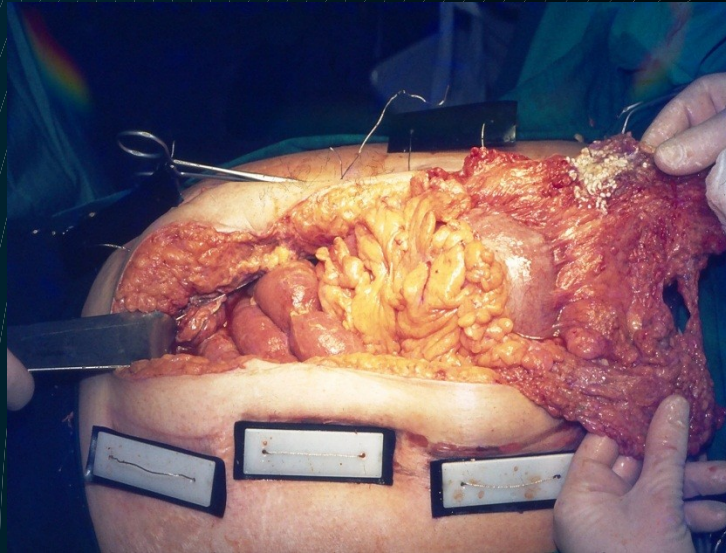
We abandoned use of retention sutures because of abdominal wall necroses

Now there is a revival of this method because of high closure rates

Wittmann DH, et al. World J Surg 1990;14(2):218-26.
DiSaia PJ, et al. J Am Coll Surg 1994;178(2):177-80.
Cothren CC, et al. Am J Surg 2006;192(2):238-42.
Gaddnas F, et al. Scand J Surg 2007;96(4):301-7.
Joglar F et al. J Surg Res 2010;162(2):274-8.

USE OF RETENTION SUTURE in 1978

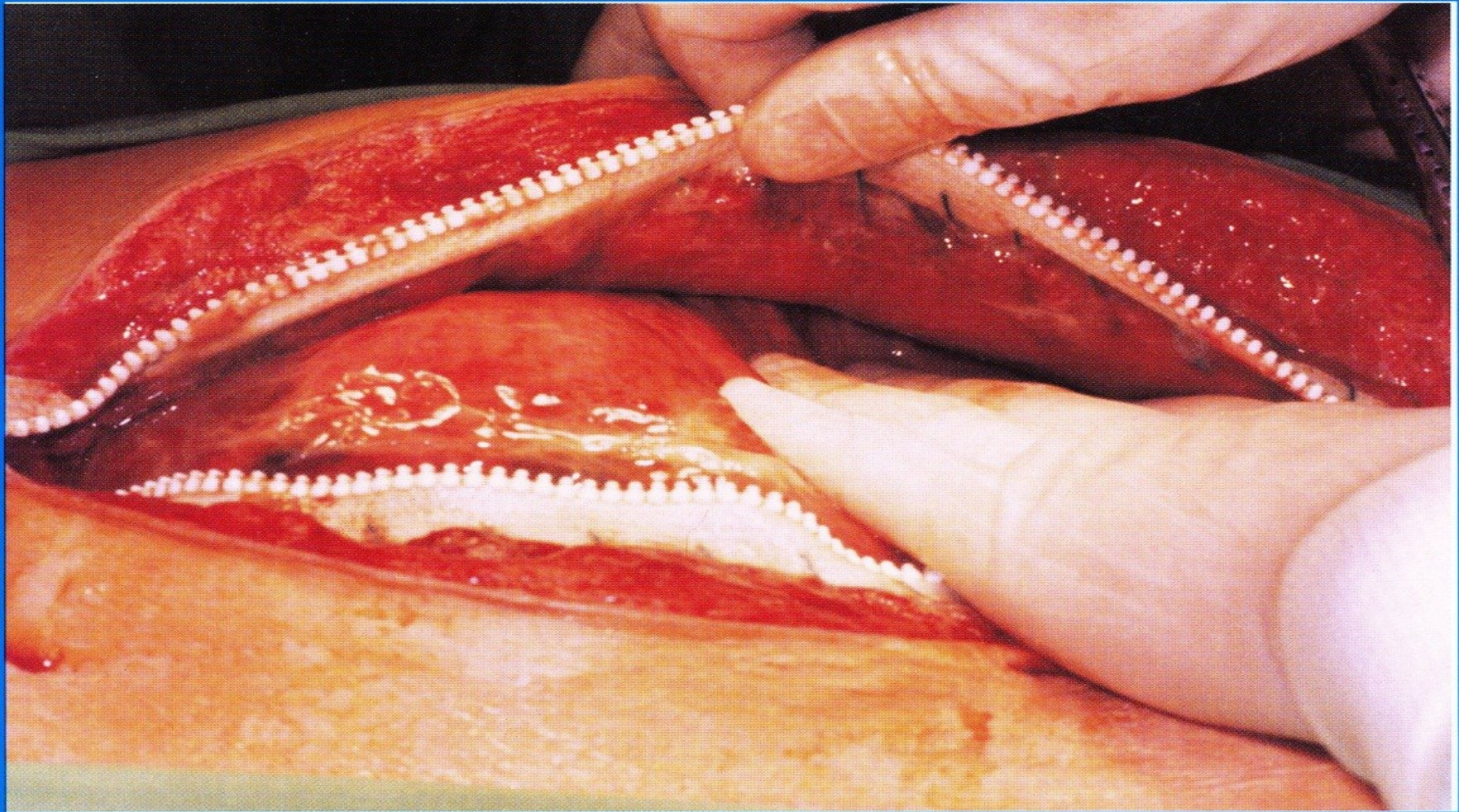




1982

Planned Open Abdomen

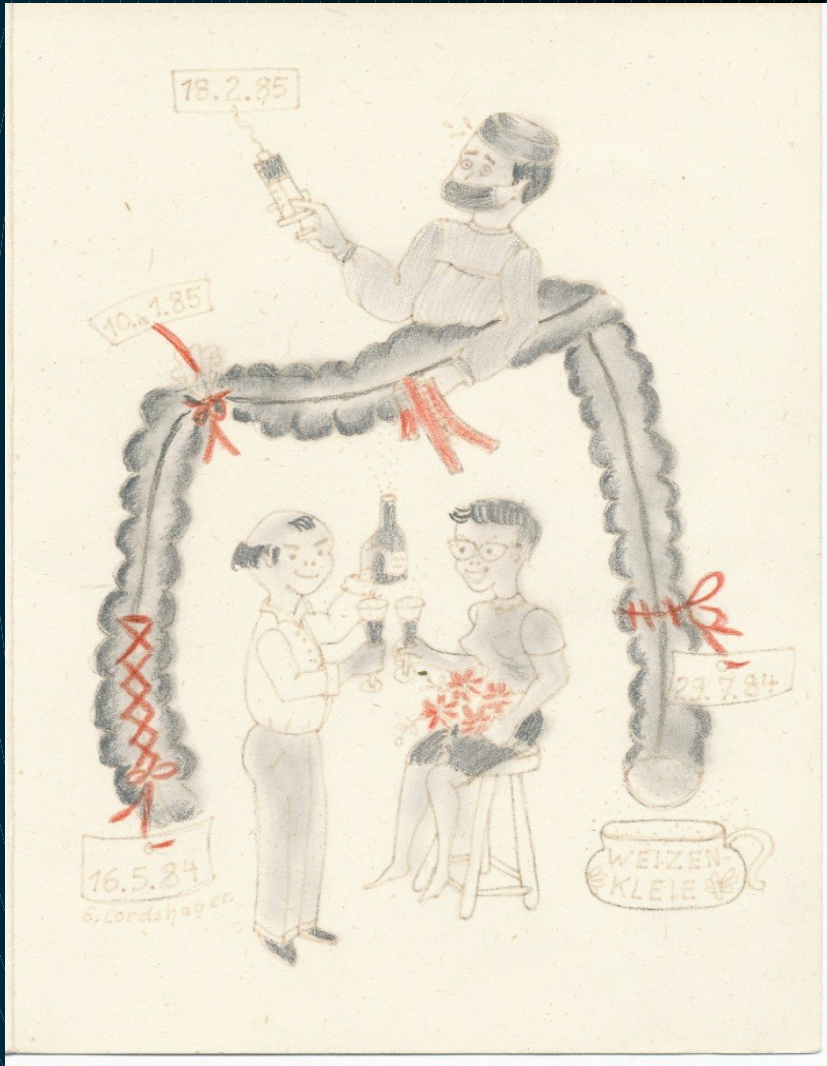
History of devices for temporary abdominal closure



1984

May 16, 1984 :Zipper used for STAR

16 de mayo 1984: Cremallera utiliza para STAR



- Rupture of ascending Colon due to Bowel Obstruction from sigmoid cancer and massive contamination of the peritoneum
- La rotura de colon ascendente debido a la obstrucción intestinal por cáncer de sigmoides y la contaminación masiva del

Sehr geehrter Herr Doktor.

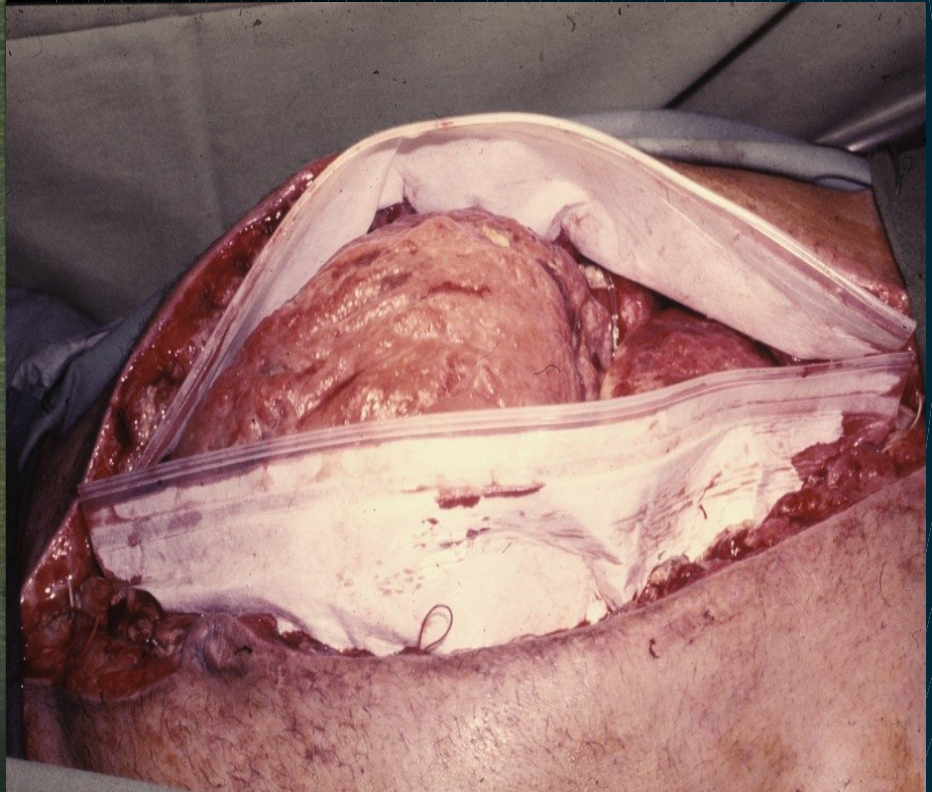
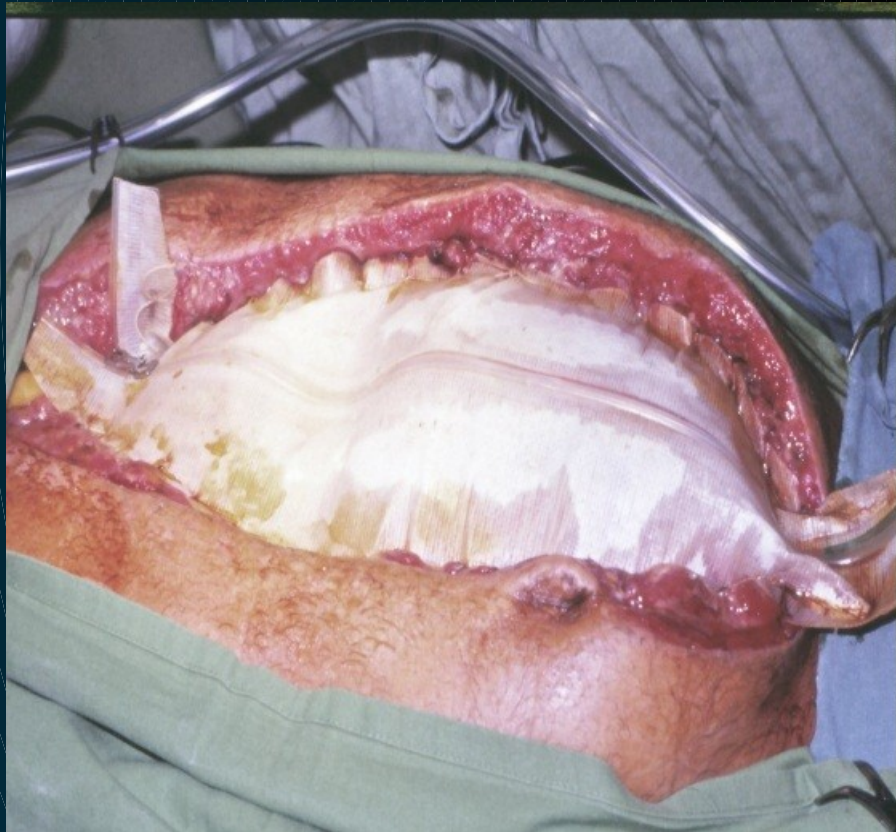
Aus 16.5.85 feiern wir meinen ersten Geburtstag.

Zwei Gläser auf Ihr Wohl, eine Flasche auf meine Gesundheit in der Hoffnung, daß es hilft.

Mit freundlichen Grüßen
Edith u. Hans Borchshagen

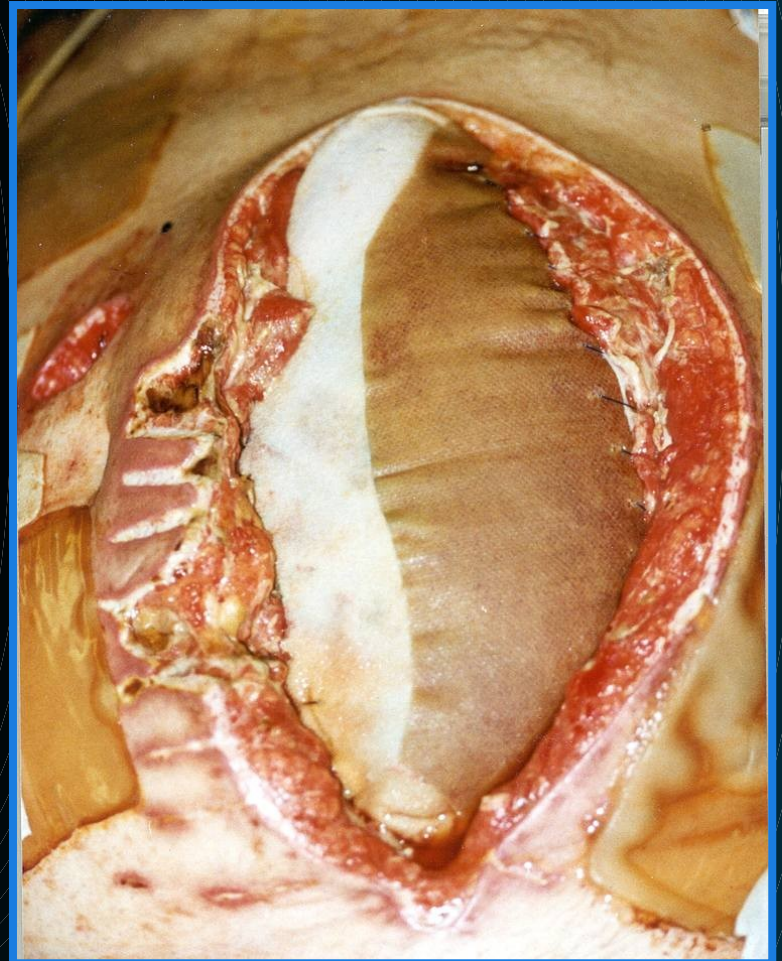
1986

TAC + Temporary Abdominal Closure using the slide fastener Ethizip



1987

The planned open abdomen temporary closed with artifcal bur fascia prosthesis



Planned Open Abdomen

Useful Terminology

STATIC Procedures

- **OPEN COELOSTOMA**
open abdomen
- **MESCH COELOSTOMA**
covering the gap with a mesh)
- **BOGOTA COELOSTOMA**
covering with plastic drape
- **VAC COELOSTOMA**
plastic drape over hypobaric wound

DYNAMIC Procedure

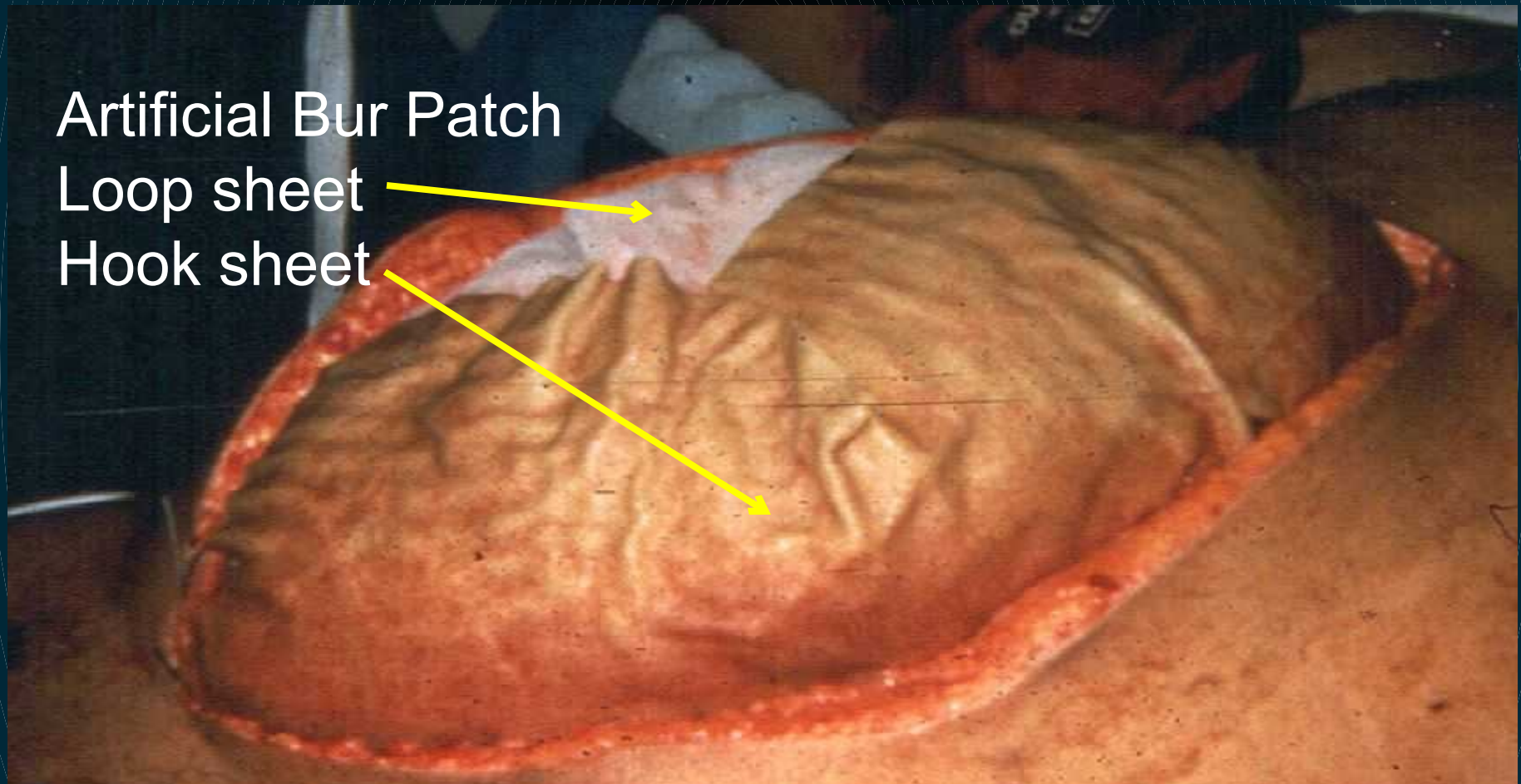
- **DNS Coelostoma**
Dynamic Retention Sutures to temp close
- **ZIPPER Coelostoma**
commercial zipper
- **ETHIZIP Coelostoma**
slide fastener to temp close
- **Bur Patch Coelostoma**
Artificial Bur fascia prosthesis

Natural bur and artificial bur

Fig 10 *Arctium lappa*



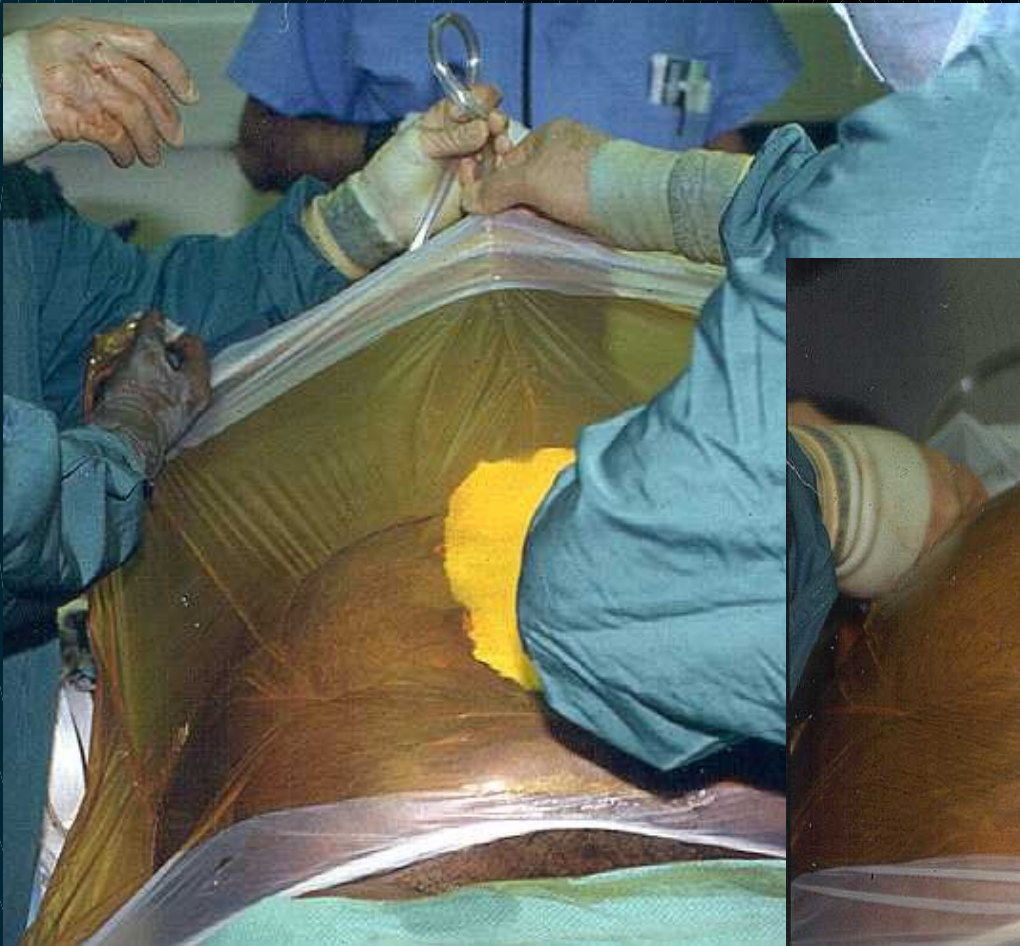
Abdominal Compartment Syndrome in Trauma



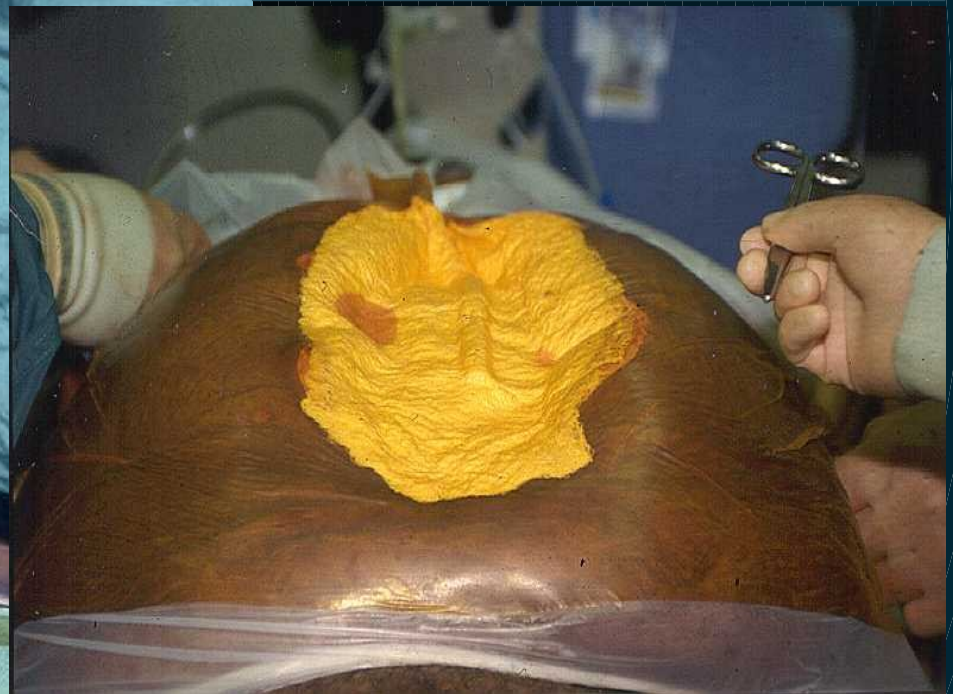
A fascia prosthesis for temporary abdominal closure

Forming the Hypobaric Wound Shield

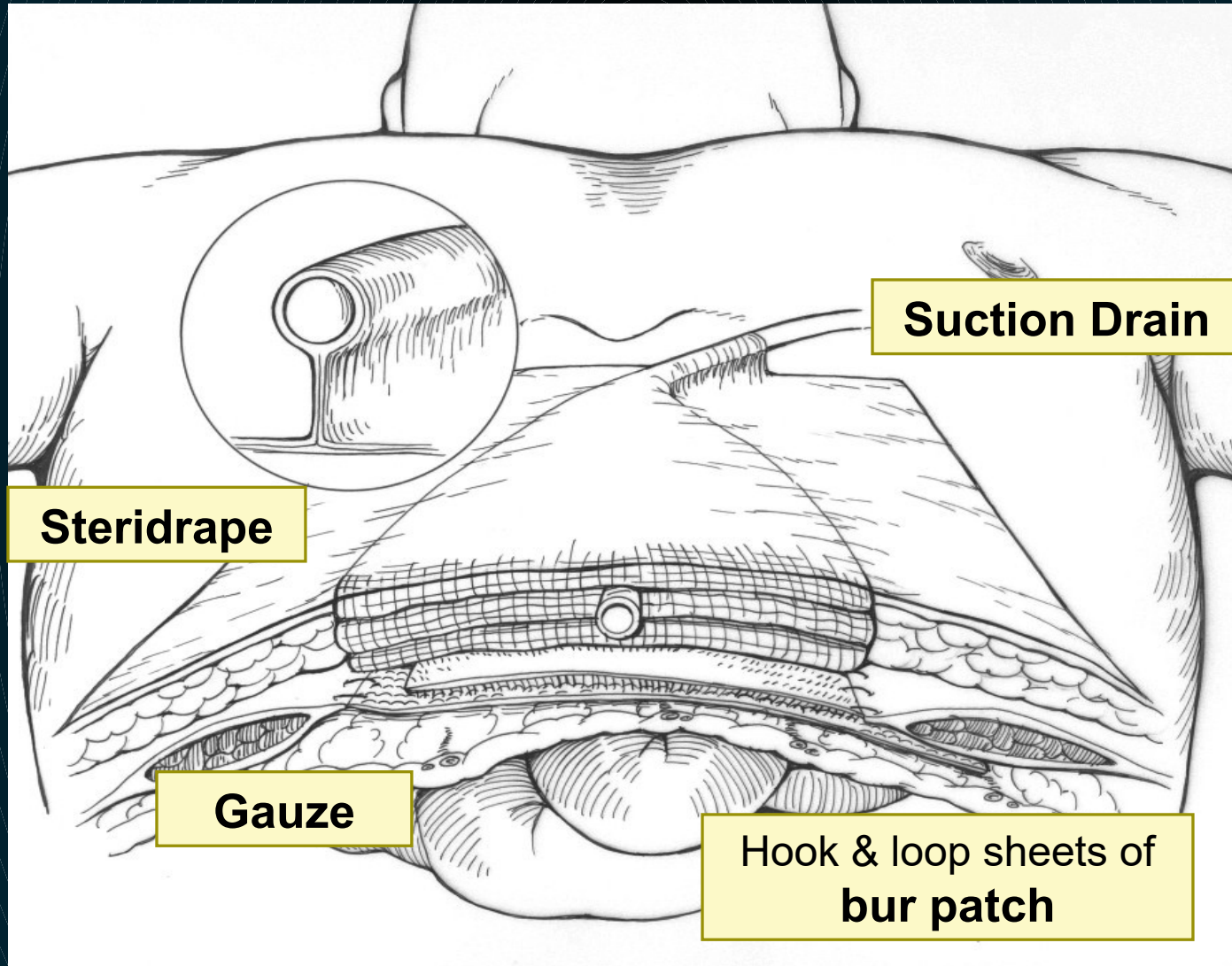
Hypopack, STAR Hypopack



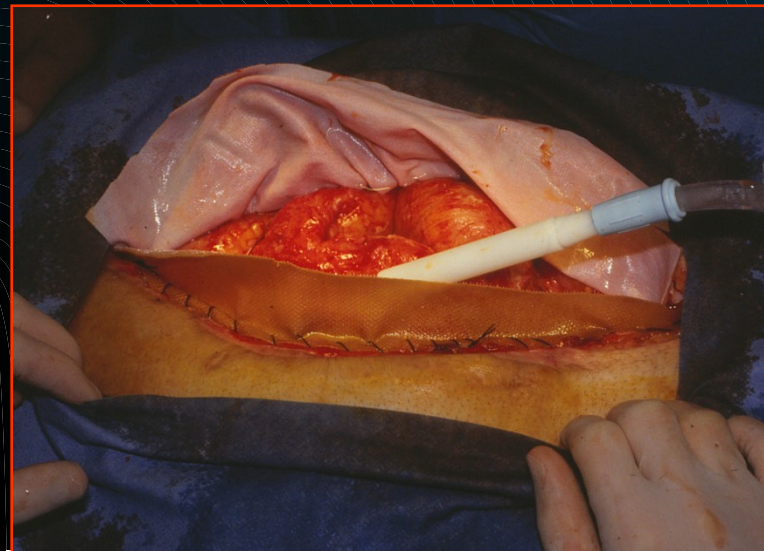
Suction must be applied
in the OR immediately
after closure



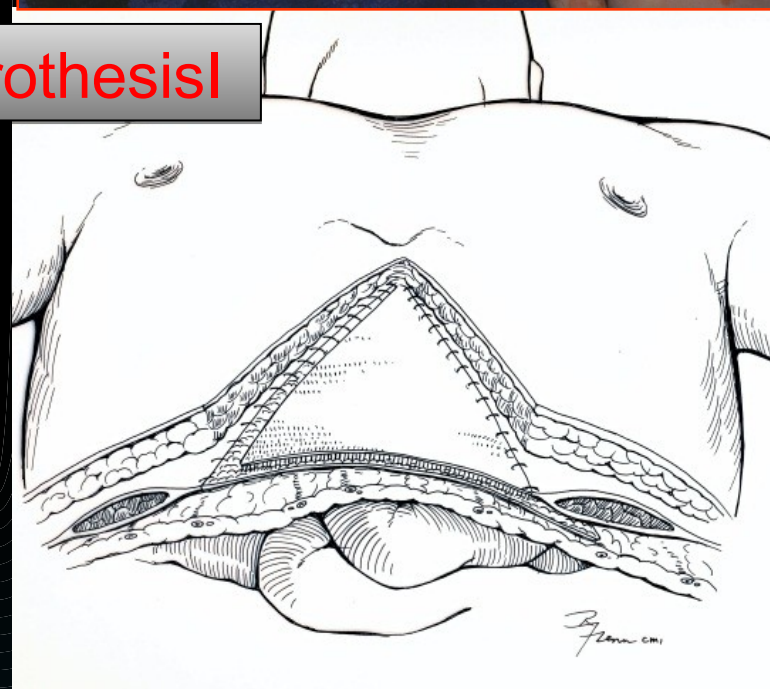
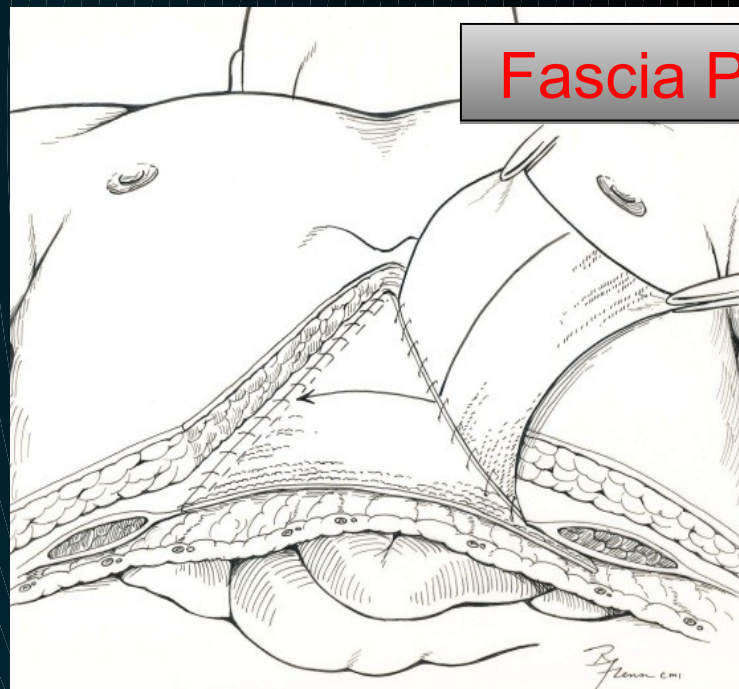
Artificial bur patch with hypopack



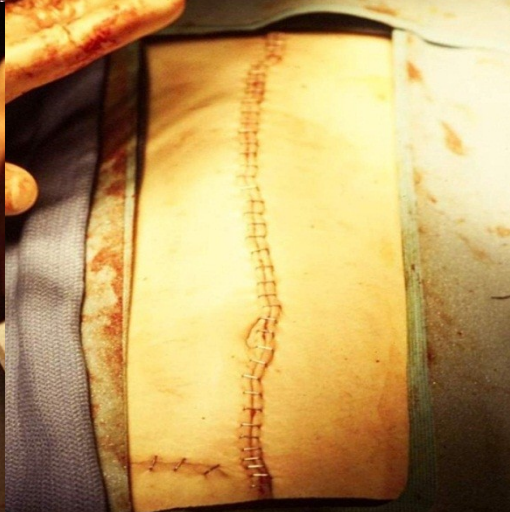
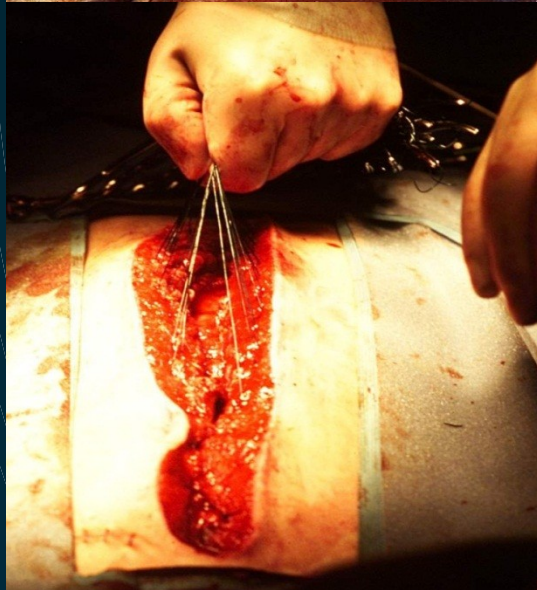
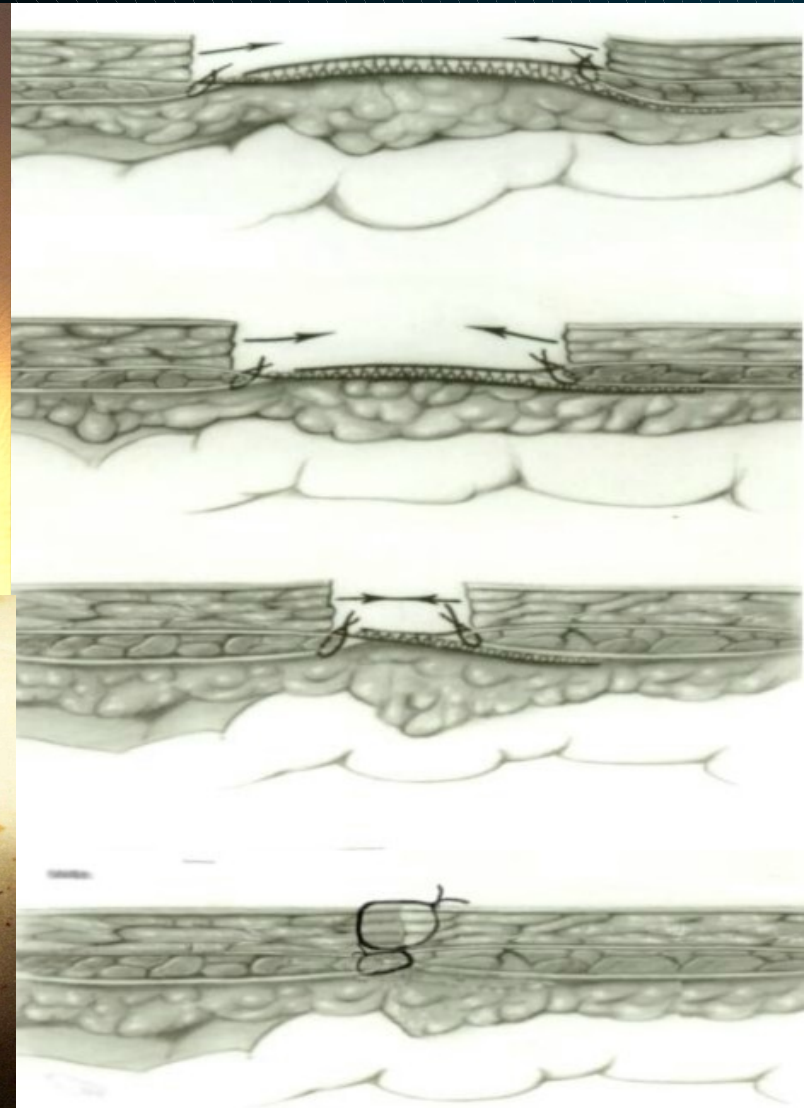
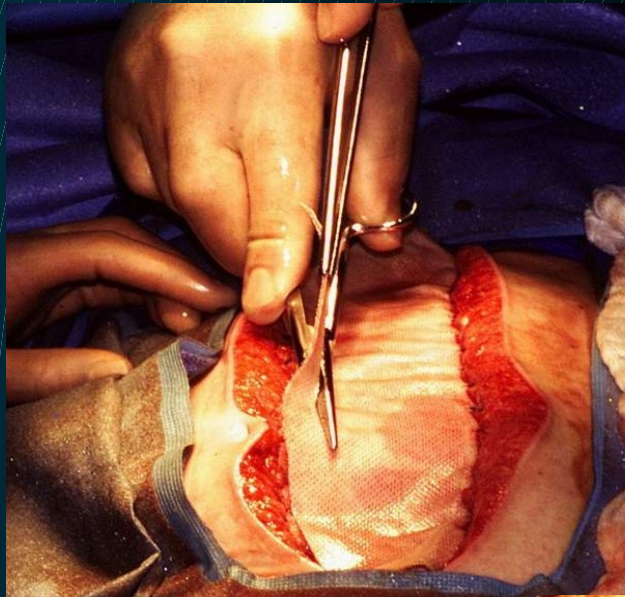
Artificial bur patch
without hypopack



Fascia ProthesisI



Approximation of Fascia - Trimming of Patch - Final closure



Artificial bur patch for temporary abdominal closure

Summary: Decisive point for success: have an intact abdominal envelope at all times

- Open coelostoma
- Mesh coelostoma
- Marlex coelostoma
- Gortex coelostoma
- VAC coelostoma
- DRS -coelostoma
- Ethizip coelostoma
- Divided mesh coelostoma
- Bur patch coelostoma

Static

Dynamic

Experience led to
the
Surgical dogma:
Always Close...

Artificial Bur Patch uses:

- As a simple temporary closure device
- As part of staged abdominal repair (STAR)
STAR is an operative concept mandating abdominal re-explorations every 24 h to combine damage control with definitive repair.

Number of abdominal entries per patient (STAR using the artificial bur patch)

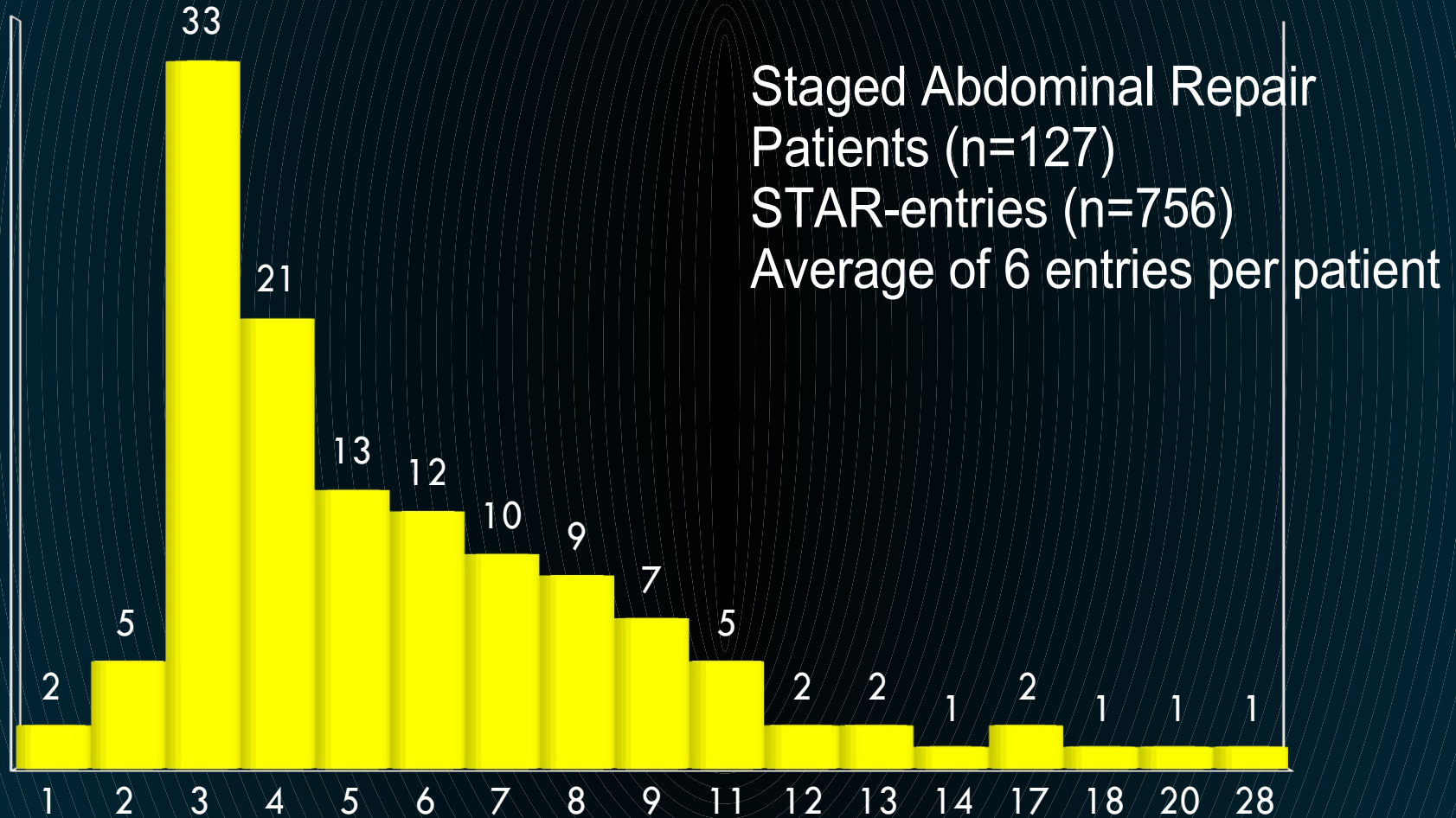
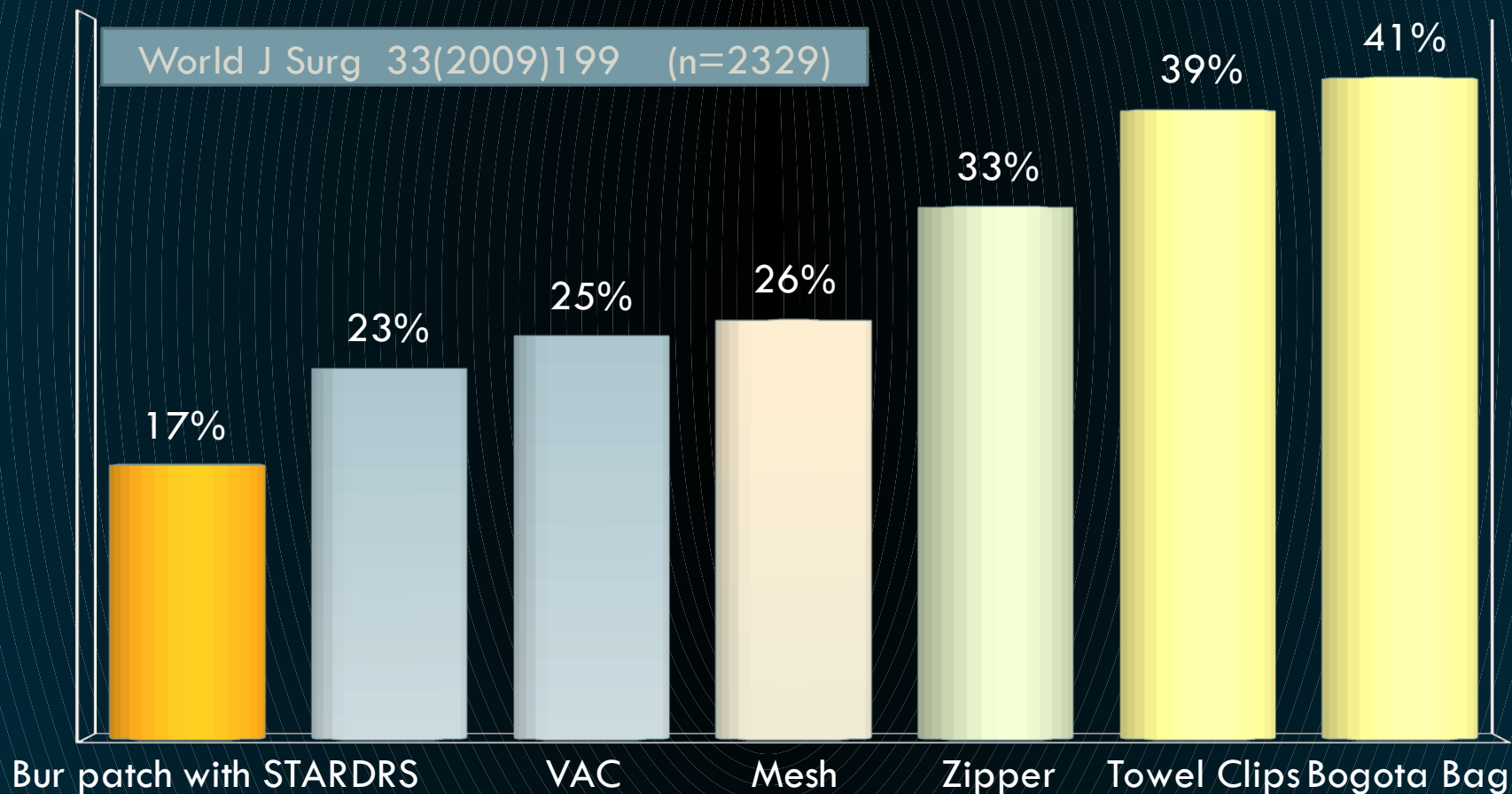


Fig.: 5, MS 414

Mortality of various forms coelostomas (Series II) 2329 cases in 69 studies

2009



Purpose of the Fascia Prosthesis or Artificial Bur Closure Device

(common names used: Wittmann Patch – STAR Patch)

The sole purpose of the fascia prosthesis is to assist keeping the planned open abdomen open for repair with minimal trauma and allow for final fascia-to-facial closure