II Congreso

Sociedad Hispanoamericana de Hernia

3, 4 y 5 de mayo de 2018
Aula Magna de la Fundación Jiménez Díaz
Madrid - España

INFECCIÓN CRÓNICA DE LA MALLA
¿Cómo la trato?

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INFECCION DE LAS PROTESIS

- Devastadora tanto para el paciente como para el sistema sanitario
- Prolonga la hospitalización e incrementa las reoperaciones, la morbilidad y el coste.
- Complicación más temida.

Petersen S, Henke G, Freitag M, Faulhaber A, Ludwig K. *Deep Prosthesis Infection in Incisional Hernia Repair: Predictive Factors and Clinical Outcome*. Eur J Surg 2001; 167: 453-7.

INCIDENCIA

Table 1. Incidence of mesh infection after laparoscopic or open hernia repair surgery

Reference	Study population (*n*)	Technique of hernia repair	Incidence of mesh infection
Heniford *et al.* [14]	407	Laparoscopic ventral and incisional hernia repair	0.98%
Heniford *et al.* [15]	822	Laparoscopic ventral hernia repair	0.7%
Kirshtein *et al.* [16]	103	Laparoscopic incisional hernia repair	2%
Petersen *et al.* [17]	121	Open incisional hernia repair	7%
Cobb *et al.* [18]	95	Open incisional hernia repair	8%

- Hernia incisional: 4-7%
- Hernia inguinal: 0,5-1%.

Poulose BK, Shelton J, Phillips S, et al. Epidemiology and cost of ventral hernia repair: making the case for hernia research. Hernia 2012;16:179–83.

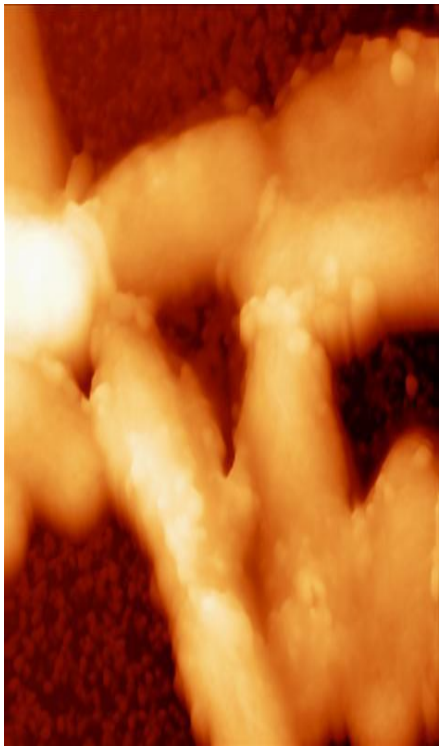
HIPOTESIS DE RESISTENCIA DE LOS BIOFILMS

(*Costerton et al* 1999)

Pobre *difusión de los antibióticos* a través de la matriz polimérica que rodea el biofilm

La *heterogeneidad bacteriana* debido a bacterias en crecimiento lento, estado semilatente.

Mecanismos reducidos de *susceptibilidad*, conferidos por fenotipos adoptados por las bacterias



Costerton JW, et al. *Bacterial biofilms: a common cause of persistent infection*. **Science 1999; 284: 1318-22**

BIOFILM = *Resistencia*

- Bacterias 1.000 veces más resistentes.
- Intercambio de ADN (transferencia de plásmidos):

  RESISTENCIA

- Situaciones de inmunodepresión del huésped cronifican la infección

  (***Infección tardía del biomaterial***)

Costerton JW, et al. *Bacterial biofilms: a common cause of persistent infection*. **Science 1999; 284: 1318-22**

Table 2 Contaminating organisms identified on the infected mesh

Microbiology	Number of patients (%)
Staphylococcus aureus	29 (43.3)
MRSA	12 (18.2)
Staphylococcus epidermidis	10 (15.1)
Escherichia coli	6 (9.1)
Anaerobic/Enterococcus	9 (13.6)
Pseudomona	4 (6)
Proteus	4 (6)
Klebsiella	2 (3)

MRSA = Methicillin-resistant *Staphylococcus aureus*.

REPARACION HERNIARIA

↓

SOSPECHA INFECCIÓN PRÓTESIS

Persistencia de herida quirúrgica infectada

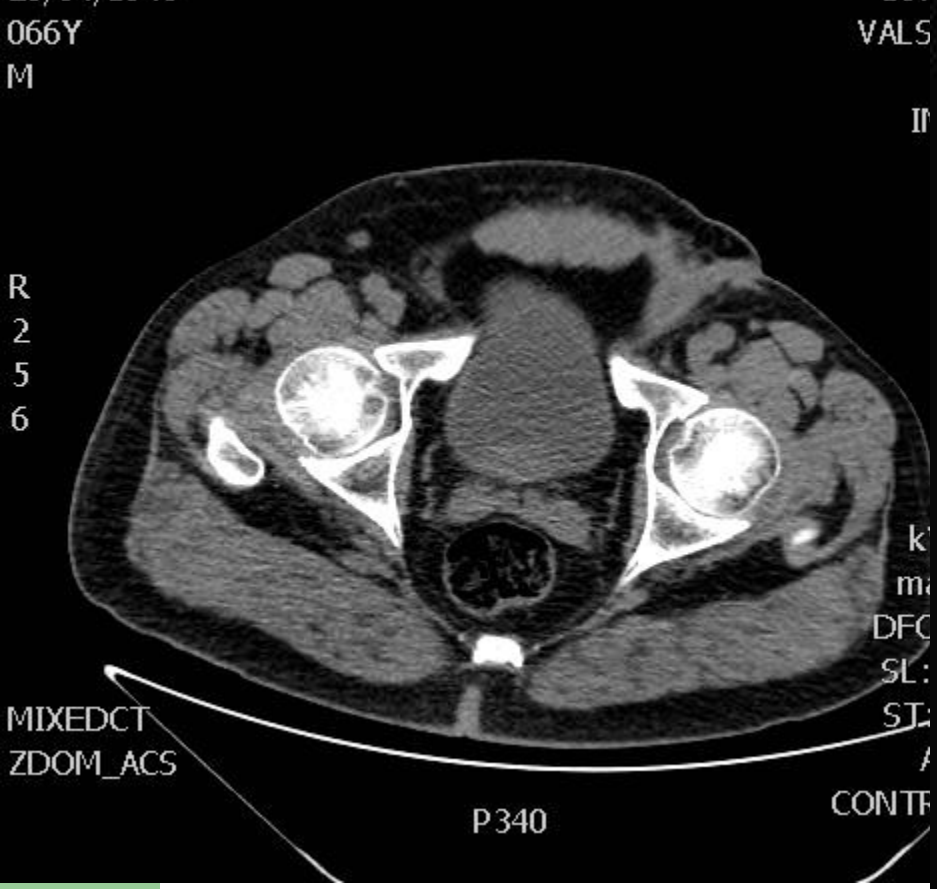
Sinus proveniente de Herida quirúrgica infectada

Sinus exudativo de nueva aparición

↓

Confirmación cultivo exudado

APOYO DE PRUEBAS DE IMAGEN



APOYO DE PRUEBAS DE IMAGEN

¿CUANTO TIEMPO ESPERAMOS PARA ACTUAR?

<12 meses

DEPENDE DE
-estado del paciente
-comorbilidad
-no sepsis
-tipo de prótesis
-deseo del paciente

¿PODEMOS DAR UNA OPORTUNIDAD A LA PRÓTESIS?

¿Se podría intentar preservar la prótesis?

-drenaje, limpieza exhaustiva y cierre con drenajes

-cura por segunda intención (+/- TPN)

-drenaje guiado por TC

Resolución espontánea en 15-19% de casos

…pero depende del tipo de prótesis

The American Journal of Surgery

Clinical Science

Predictors of mesh infection and explantation after abdominal wall hernia repair

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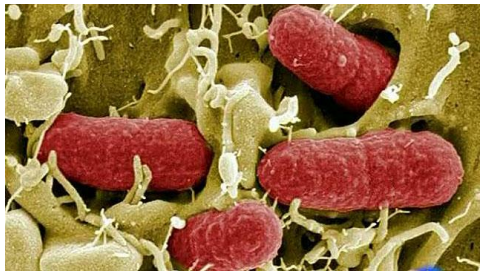
FISIOPATOLOGÍA



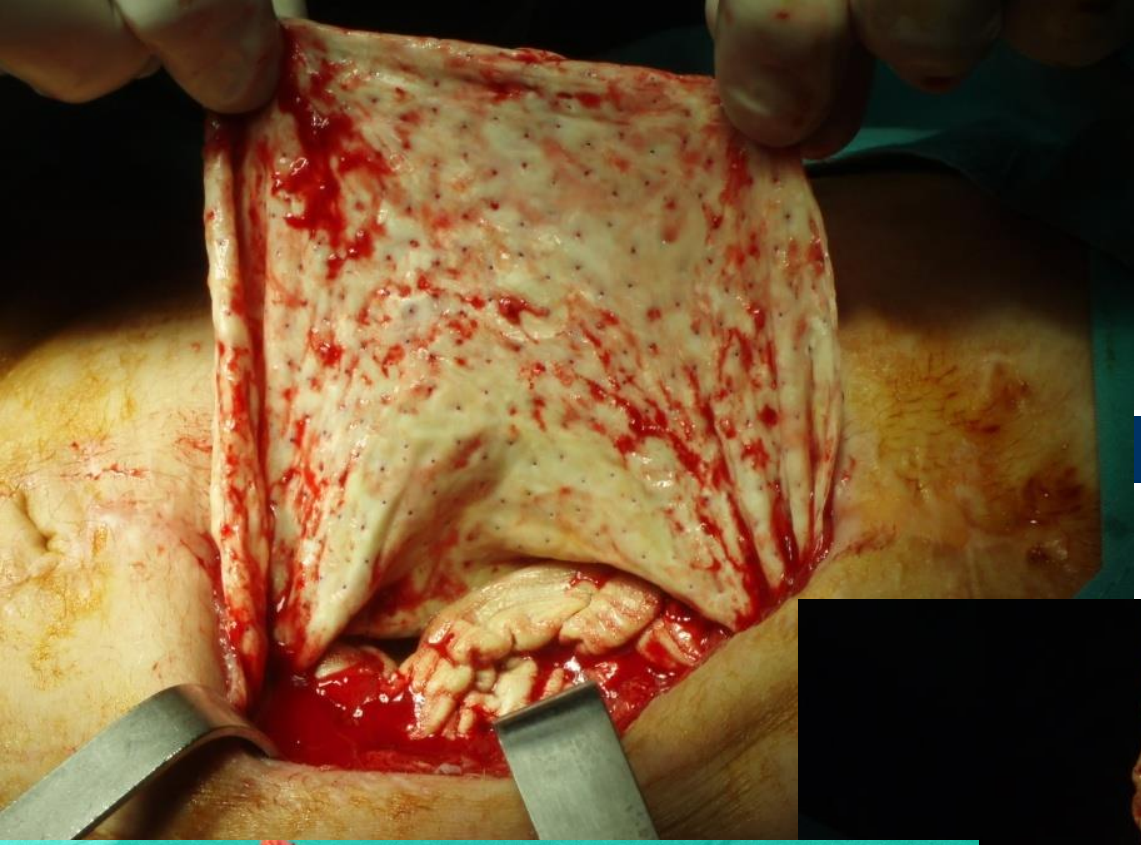
La posibilidad de infección están en relación con la ***porosidad*** del material protésico.

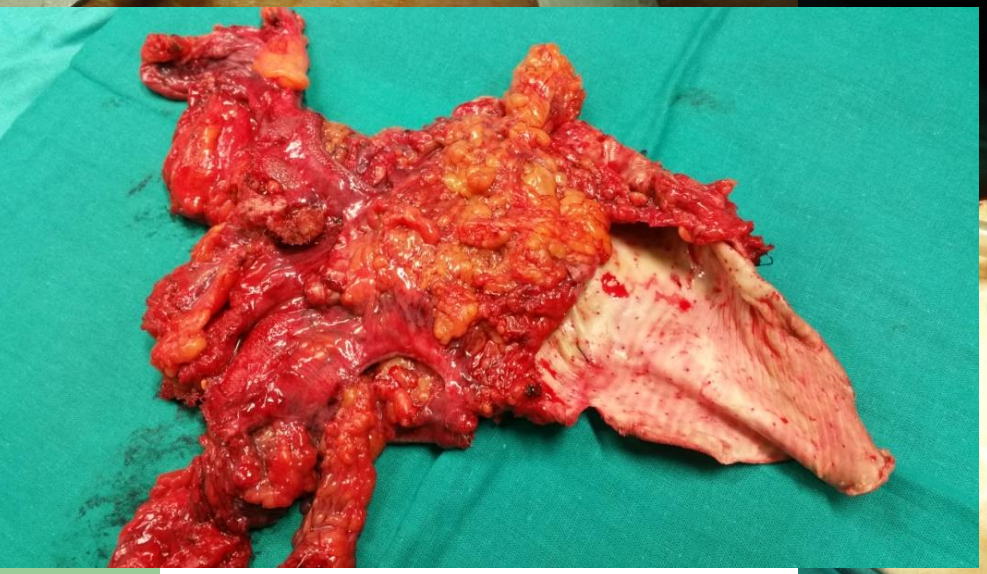
- poros < ***10 micras***: granulocitos y macrófagos no pueden neutralizar y destruir las bacterias.

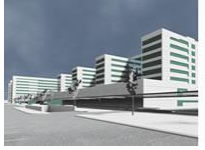
- poros más ***anchos:*** previenen crecimiento de bacterias y permiten fibroplastia y angiogénesis.

Poulose BK, Shelton J, Phillips S, et al. Epidemiology and cost of ventral hernia repair: making the case for hernia research. Hernia 2012;16:179–83.

Variables	Mesh explantation n = 48	No mesh explantation n = 18	Univariate *P*	Multivariate OR (95% CI)	Multivariate *P*
No	42 (87.5)	18 (100)			
(Postoperative) surgical wound infection					
Yes	21 (43.7)	5 (27.7)	.023	.09 (.12–1.95)	.080
No	27 (56.3)	13 (72.3)			
Drain use					
Yes	40 (83.3)	14 (77.7)	.111	.65 (.23–1.12)	.434
No	8 (16.7)	4 (22.3)			
Operative time in previous repair (min)					
<90	5 (10.4)	5 (27.7)	**.019**	2.01 (.55–3.89)	.104
91–179	12 (25)	10 (55.6)			
>180	31 (64.5)	3 (16.6)			
Case status					
Urgent	8 (16.6)	1 (5.5)	**.001**	.55 (.23–1.1)	.072
Elective	40 (83.4)	17 (94.5)			
Type of mesh					
PPL	27 (56.2)	15 (83.3)	**.004**	**3.13 (1.71–5.21)**	**.001**
PTFE/Dualmesh	17 (35.4)	1 (5.5)			
PVDF	2 (4.2)	1 (5.5)			
Polyester	0	1 (5.5)			
Biologic	2 (4.2)	0			
Mesh position in hernia repair					
Onlay	44 (91.6)	11 (61.1)	**.001**	**3.51 (1.23–6.12)**	**.003**
Sublay	4 (8.4)	7 (38.9)			
Intraperitoneal	0	0			
Prosthesis size					
Standard (6 × 11 cm; 7 × 15 cm)	4 (8.4)	10 (55.6)	.061	1.9 (.55–3.33)	.089
Large (15 × 15 cm: 20 × 15 cm)	19 (39.5)	4 (22.3)			
Very large (20 × 30 cm; 30 × 30 cm or more)	25 (52.1)	4 (22.3)			
Enterotomy (concomitant procedure)					
Planned (intestinal resection and hernia repair)	3 (6.2)	0	**.001**	**5.32 (2.1–7.43)**	**.001**
Unplanned	3 (6.2)	0			







¿EXTIRPACIÓN TOTAL o PARCIAL DE LA PROTESIS?

EXÉRESIS PARCIAL

Menos morbilidad

Menor defecto herniario residual

RECIDIVA INFECCIÓN

EXÉRESIS TOTAL

Más morbilidad

Más defecto herniario residual

Más tiempo quirúrgico

TRATAMIENTO DEFINITIVO

http://www.ncbi.nlm.nih.gov/pubmed/22689250
stages 1 4 mesh infection herni...
Partial removal of infected pari...
Partial removal of infected ...
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NCBI Resources How To
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Abstract

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Hernia. 2012 Aug;16(4):445-9. doi: 10.1007/s10029-012-0931-4. Epub 2012 Jun 12.

Partial removal of infected parietal meshes is a safe procedure.

Sabbagh C[1], Verhaeghe P, Brehant O, Browet F, Garriot B, Regimbeau JM.

Author information

Abstract

INTRODUCTION: Open tension-free hernioplasty using prosthetic meshes dramatically reduced recurrence rates after hernia or incisional hernia repair and has become the rule. Mesh infections (MI) are the major complication of prosthetic material. The aim of this study was to assess the efficacy of partial removal of mesh (PRM) therapy in the treatment of MI.

MATERIALS AND METHODS: From January 2000 to April 2010, from a prospective database, we retrospectively selected patients who underwent surgery for MI. We studied the epidemiological data (sex, age, obesity, diabetes, smoking), the operating time of the initial intervention, the presence of intestinal injuries during the first intervention, the average interval between initial surgical procedure and MI, the location of the hernia, the average size of the hernia, type of mesh used, the position of the mesh, type of surgery performed, the number through interventions required to achieve a cure, the cumulative duration of hospital stay and hernia recurrence rates.

RESULTS: Twenty-five patients were supported for a MI in our institution. There were 9 women (36 %) and 16 men (64 %). The median age was 59 years (range 37-78). There were 4 inguinal hernias (16 %), 15 incisional hernias (60 %) and 6 multirecurrent incisional hernias (24 %). It was performed a PRM in 92 % of cases (n = 23), a total excision of the prosthesis in 4 % of cases (n = 1) and no removal of prosthesis in 4 % of cases (n = 1). The average number of reoperations before healing was 1 (range 1-5). The mean cumulative duration of hospitalization until healing was 9.5 days (range 2-43). No visceral resection was performed.

CONCLUSION: PRM is feasible in most cases allowing first to spare the capital parietal patients and secondly to avoid major surgery. In case of failure, total removal of the mesh can be discussed.

PMID: 22689250 [PubMed - indexed for MEDLINE]

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Recent Activity

Hernia (2009) 13:631–637
DOI 10.1007/s10029-009-0541-y

ORIGINAL ARTICLE

Infections associated with prosthetic repairs of abdominal wall hernias: pathology, management and results

M. J. Tolino · D. E. Tripoloni · R. Ratto · M. I. García

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Abstract
Purpose To analyse clinical and demographic factors of patients who suffered infection of the surgical site requiring mesh removal as a complication of prosthetic repairs, details of the hernioplasties in which meshes were implanted and their management and outcomes.
Methods Factors related to infection (demographic variables and characteristics of the repairs and mesh utilised) and the management before proceeding to mesh removal were obtained from patient charts. Collected specimens (meshes and tissues) from 32 consecutive patients were cultured and observed microscopically. The outcomes after mesh removal were prospectively evaluated.
Results Twenty-two patients underwent incisional hernioplasties and ten inguinal hernioplasties; most of the procedures took a long time, and 28 patients presented early wound complications (seroma or haematoma). During the under local anaesthesia. Twenty-two meshes were totally removed (nine after partial extraction); in the remaining ten cases partially removal was successful. Most of the meshes (24) were made of multifilament polypropylene; microscopic observation of neighbouring tissues showed leucocyte infiltration, giant cell reaction, disorganisation of the collagen fibres and abscedation. Treatment of 32 patients required 51 operations. Following mesh removal, there were six recurrences and two fistulas of the bowel. The average follow-up was 40 months (30–97).
Conclusions Most of the infections requiring mesh removal were related to prolonged repair operations that presented untreated early postoperative wound complications. Partial extraction of meshes frequently leads to failures and complications. Surgical exploration should be performed under general anaesthesia to accomplish complete mesh extraction.

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Partial versus complete removal of the infected mesh after abdominal wall hernia repair

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ABSTRACT

Background: To compare the results with complete mesh removal (CMR) versus partial mesh removal (PMR) in the treatment of mesh infection after abdominal wall hernia repair (AWHR).
Methods: Retrospective review of all patients who underwent surgery for mesh infection between January 2004 and May 2014 at a tertiary center.
Results: Of 3470 cases of AWHR, we reported 66 cases (1.9%) of mesh infection, and 48 repairs (72.7%) required mesh explantation. CMR was achieved on 38 occasions, while PMR was undertaken ten times. We observed more postoperative complications in CMR than PMR group ($p = 0.04$). Three patients with intestinal fistula were reoperated in postoperative period after a difficult mesh removal; one of them died due to multiple organ failure. The overall recurrence rate after explantation was 47.9%: recurrence was more frequent in CMR group ($p = 0.001$), although persistent or new mesh infection was observed more frequently with PMR ($p = 0.001$).
Conclusions: Although PMR has less postoperative morbidity, shorter duration of hospitalization and lower rate of recurrence than CMR, prosthetic infection persists in up to 50% of cases.

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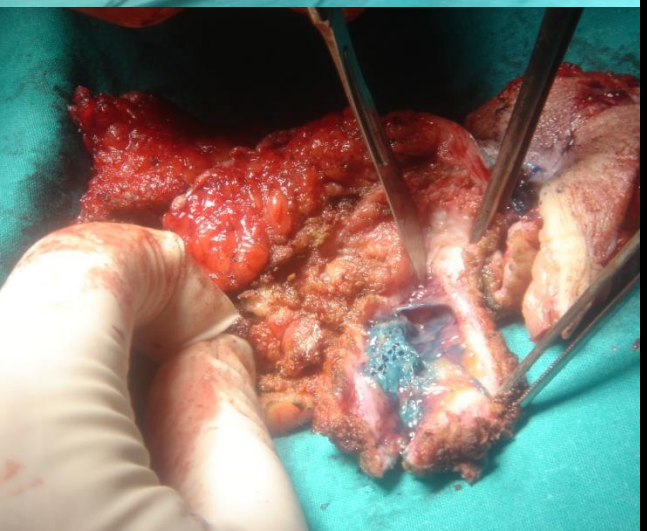
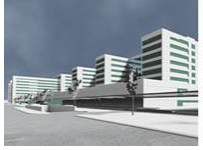
Exéresis PARCIAL de la prótesis

Primera opción en mallas muy grandes, ÚNICO SINUS o localización sublay





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Exéresis COMPLETA de la prótesis

Table 3

Surgical and postoperative variables of the partial mesh removal (PMR) and complete mesh removal (CMR) groups.

Variables	Partial mesh removal (PMR) N = 10	Complete mesh removal (CMR) N = 38	P
Operative time			
<90 min	2 (20)	2 (5.2)	0.135
Between 91 y 179 min	7 (70)	18 (47.3)	
>180 min	1 (10)	18 (47.3)	
Explanted mesh			
PPL	8 (80)	19 (50)	**0.001**
PTFE/Dualmesh	0	17 (44.6)	
PVDF	2 (20)	0	
Polyester	0	0	
Biologic	0	2 (5.2)	
Type of placed mesh at the same time of removal			
Prosthesis	0	8 (21)	0.091
PPL	0	1 (2.6)	
Biological	0	4 (10.5)	
PPL + Biological	0	3 (7.8)	
No prosthesis	10 (100)	30 (78.9)	
Hernia location			
Groin	1 (10)	2 (5.3)	0.072
Ventral	9 (90)	36 (94.7)	
Mesh location in prior hernia repair			
Onlay	7 (70)	37 (97.4)	**0.001**
Sublay	3 (30)	1 (2.6)	
Surgical technique			
Simple fascial closure with mesh	0	2 (5.3)	0.320
Simple fascial closure without mesh	10 (100)	30 (78.9)	
Bridged repair	0	4 (10.5)	
CST	0	2 (5.3)	
Intraoperative complications			
Intestinal resection/suture	1 (10)	5 (13.1)	0.222
Postoperative complications	**3 (30)**	**22 (57.8)**	**0.040**
Seroma	1 (10)	7 (18.4)	
Wound infection	1 (10)	4 (10.5)	
Wound Dehiscence	1 (10)	1 (2.6)	
Evisceration	0	1 (2.6)	
Intestinal fistula	0	3 (7.8)	
Reoperation	0	4 (10.5)	
Death	0	1 (2.6)	
Recurrence			
Yes	1 (10)	22 (57.9)	**0.001**
No	9 (90)	16 (42.1)	
Persistent o reactivation mesh infection			
Yes	5(50)	1(2.6)	**0.001**
No	5(50)	37(97.4)	
Duration of hospitalization (median ± SD)	6.5±4.1	9.9±4.4	**0.034**

Si se explanta, ¿como debería ser reemplazada?

1- **Reparación primaria (One-stage repair):**

-reparación sin prótesis: rafia

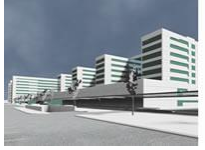
-reparación usando prótesis biológica

-reparación usando prótesis sintética reticular

-reparación usando prótesis bioabsorbible (Phasix)

2- **Reparación diferida (Two-stage repair):**

Corrección quirúrgica y prótesis reticular sintética >6 meses.



INFECCIÓN DE PRÓTESIS.
NECESIDAD DE EXPLANTE

RECONSTRUCCIÓN PARED

ONE-STAGE

-la técnica ideal
-menos gasto sanitario
-más confortable

-quemamos “naves” y limitamos posibilidades ante nueva infección.

IMPORTANTE DEFINIR EL PAPEL DE LA PRÓTESIS:

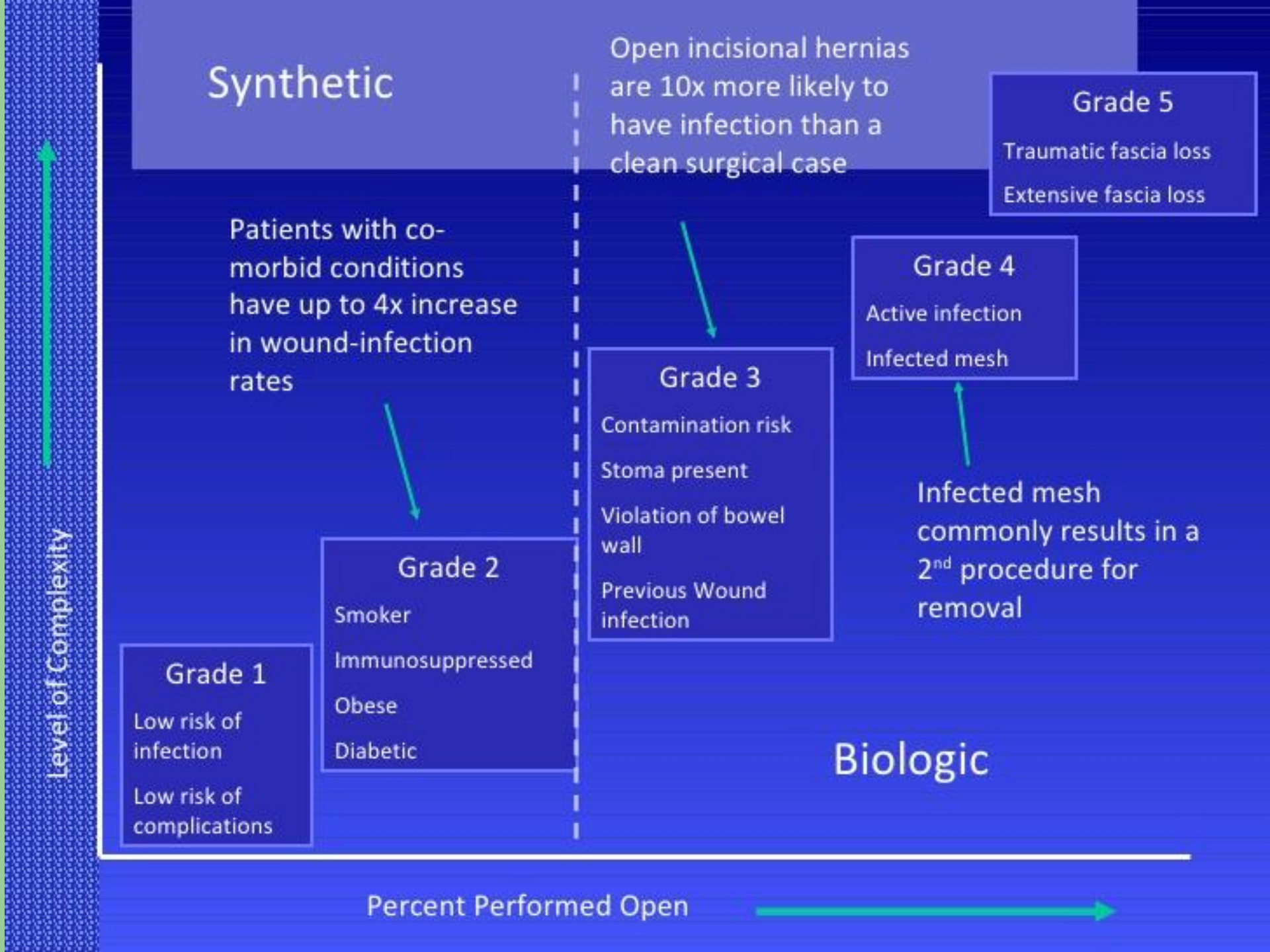
Sintética reticular
Biológica
Bioabsorbible

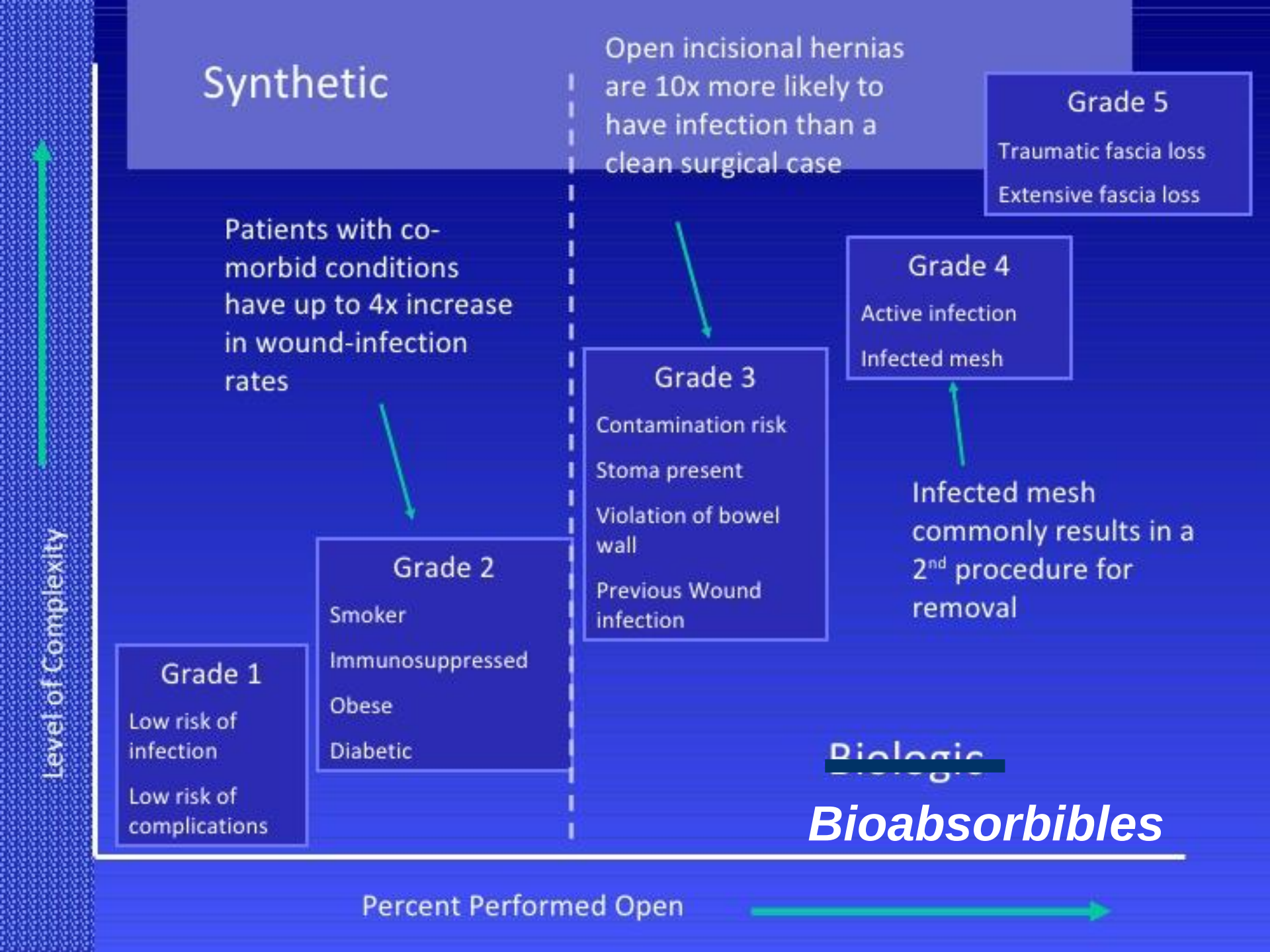
TWO-STAGE

-técnica con menos probabilidad de reinfección

-mayor estancia hospitalaria
-más incomoda
-más gasto sanitario

-recidiva > 50% (hernia ventral planeada)


Synthetic
Open incisional hernias are 10x more likely to have infection than a clean surgical case
Grade 5
Traumatic fascia loss
Extensive fascia loss
Patients with co-morbid conditions have up to 4x increase in wound-infection rates
Grade 4
Active infection
Infected mesh
Grade 3
Contamination risk
Stoma present
Violation of bowel wall
Previous Wound infection
Infected mesh commonly results in a 2nd procedure for removal
Grade 2
Smoker
Immunosuppressed
Obese
Diabetic
Grade 1
Low risk of infection
Low risk of complications
Biologic
Level of Complexity
Percent Performed Open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Smoker
Immunosuppressed
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Grade 1
Low risk of infection
Low risk of complications
Biologic
Bioabsorbibles
Level of Complexity
Percent Performed Open

PREVENCIÓN > TRATAMIENTO

- **Medidas:**

  -técnica quirúrgica cuidadosa y meticulosa

  -evitar hematomas y espacios muertos (drenajes aspirativos)

  -manipular la prótesis lo mínimo posible

  -prótesis no esté en contacto con la piel

  -cambiar los guantes al insertar la prótesis

  -evitar cuerpos extraños (filamentos de compresas quirúrgicas)

  -vigilar estado de los bordes de la herida

  -resecar la piel sobrante.

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