Especialización en
Ultrasonografía Endoscópica Avanzada

DIGESTIVO RAMON Y CAJAL MADRID

Título propio
Universidad de Alcalá

DRENAJE DE COLECCIONES PANCREATICAS

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Hospital Universitario Ramón y Cajal

INTRODUCCIÓN

Colección abdominal gigante: cuando no todo es lo que parece

Palabras clave: Drenaje. Ecoendoscopia. Prótesis metálica aposición luminal. Quiste hidatídico.

Sr. Editor,

El drenaje guiado por ecoendoscopia (DE-USE) es la técnica de elección en el manejo de las colecciones pancreáticas (CP). Las prótesis por aposición luminal (PAL) han facilitando la técnica de drenaje (1). Sin embargo, esto no debería nublarnos la vista cuando planeemos un DE-USE de una CP porque, ocasionalmente, estas colecciones no son lo que parecen.

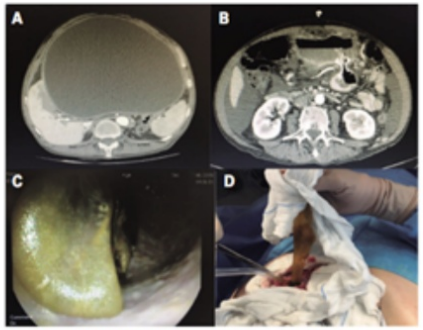
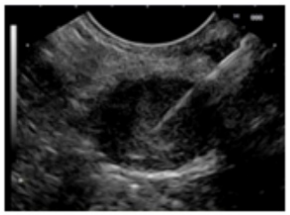


Fig. 1. *A. Colección abdominal. B. Tras drenaje mediante PAL. C. Interior de la cavidad quística. D. Extracción membrana primigenia.*

Si dudas, USE-PAAF

We recommend that endoscopic drainage of PFCs be performed only after sufficient exclusion of alternative diagnoses, such as cystic pancreatic neoplasms and pseudoaneurysms. ⊕⊕⊕⊕



ASGE The role of endoscopy in the diagnosis and treatment of inflammatory pancreatic fluid collections. Gastrointest Endosc 2016

Classification of acute pancreatitis—2012: revision of the Atlanta classification and definitions by international consensus

Peter A Banks,[1] Thomas L Bollen,[2] Christos Dervenis,[3] Hein G Gooszen,[4] Colin D Johnson,[5] Michael G Sarr,[6] Gregory G Tsiotos,[7] Santhi Swaroop Vege,[8] Acute Pancreatitis Classification Working Group

Gut 2013;**62**:102–111.

	No necrosis	Necrosis
Agudo	**APFC (acute peripancreatic fluid collection)** Peripancreatic fluid associated with interstitial oedematous pancreatitis with no associated peripancreatic necrosis. This term applies only to areas of peripancreatic fluid seen within the first 4 weeks after onset of interstitial oedematous pancreatitis and without the features of a pseudocyst. *CECT criteria* ▶ Occurs in the setting of interstitial oedematous pancreatitis ▶ Homogeneous collection with fluid density ▶ Confined by normal peripancreatic fascial planes ▶ No definable wall encapsulating the collection ▶ Adjacent to pancreas (no intrapancreatic extension)	**ANC (acute necrotic collection)** A collection containing variable amounts of both fluid and necrosis associated with necrotising pancreatitis; the necrosis can involve the pancreatic parenchyma and/or the peripancreatic tissues *CECT criteria* ▶ Occurs only in the setting of acute necrotising pancreatitis ▶ Heterogeneous and non-liquid density of varying degrees in different locations (some appear homogeneous early in their course) ▶ No definable wall encapsulating the collection ▶ Location—intrapancreatic and/or extrapancreatic
Crónico	**Pancreatic pseudocyst** An encapsulated collection of fluid with a well defined inflammatory wall usually outside the pancreas with minimal or no necrosis. This entity usually occurs more than 4 weeks after onset of interstitial oedematous pancreatitis to mature. *CECT criteria* ▶ Well circumscribed, usually round or oval ▶ Homogeneous fluid density ▶ No non-liquid component ▶ Well defined wall; that is, completely encapsulated ▶ Maturation usually requires >4 weeks after onset of acute pancreatitis; occurs after interstitial oedematous pancreatitis	**WON (walled-off necrosis)** A mature, encapsulated collection of pancreatic and/or peripancreatic necrosis that has developed a well defined inflammatory wall. WON usually occurs >4 weeks after onset of necrotising pancreatitis. *CECT criteria* ▶ Heterogeneous with liquid and non-liquid density with varying degrees of loculations (some may appear homogeneous) ▶ Well defined wall, that is, completely encapsulated ▶ Location—intrapancreatic and/or extrapancreatic ▶ Maturation usually requires 4 weeks after onset of acute necrotising pancreatitis

Classification of acute pancreatitis—2012: revision of the Atlanta classification and definitions by international consensus

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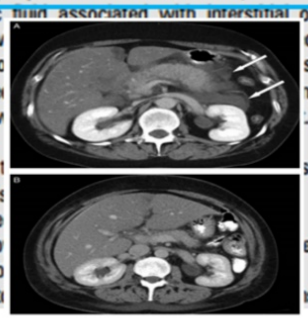
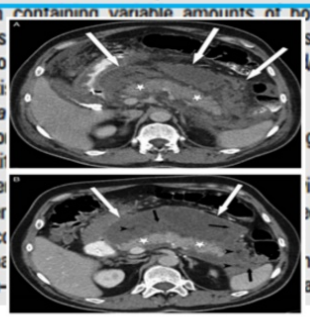
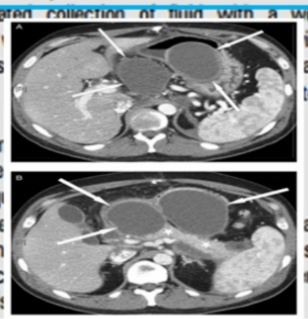
Agudo	**APFC (acute peripancreatic fluid collection)** Peripancreatic fluid associated with interstitial oedematous pancreatitis w… crosis. This term applies … seen within the first 4 we… natous pan-creatitis and v… *CECT criteria* ▶ Occurs in t… pancreatitis ▶ Homogene… ▶ Confined b… es ▶ No definab… ▶ Adjacent t… sion) 	**ANC (acute necrotic collection)** A collection containing variable amounts of both fluid and necrosis ass… s; the necro-sis can invo… l/or the peri-pancreatic ti… *CECT criteria* ▶ Occurs o… pancreatit… g ▶ Heteroge… in differer… in their c… ing degrees …ous early ▶ No defina… n ▶ Location-… atic 
Crónico	**Pancreatic pseudocyst** An encapsulated collection of fluid with a well defined inflammatory … ith minimal or no necrosis… an 4 weeks after onset of… to mature. *CECT criteria* ▶ Well circur… ▶ Homogene… ▶ No non-liqu… ▶ Well define… ated ▶ Maturation… set of acute panc… matous pancreatitis 	**WON (walled-off necrosis)** A mature, encapsulated collection of pancreatic and/or peri-pancreatic n… fined inflam-matory wall… fter onset of necrotising p… *CECT criteria* ▶ Heteroge… sity with varying d… pear homogen… ▶ Well defi… ulated ▶ Location-… atic ▶ Maturatic… set of acute necrot… 

INDICACIONES DE TRATAMIENTO

¿CUÁNDO HAY QUE TRATAR?

La mayoría de las colecciones pancreáticas se resuelven con manejo conservador

> 70% pseudoquistes

50% WON (incluso infectadas)

Efficacy of Conservative Treatment, Without Necrosectomy, for Infected Pancreatic Necrosis: A Systematic Review and Meta-analysis

VENIGALLA PRATAP MOULI,[1] VISHNUBHATLA SREENIVAS,[2] and PRAMOD KUMAR GARG[1]

Br J Surg. 2014 Dec;101(13):1721-8. doi: 10.1002/bjs.9666. Epub 2014 Oct 20.

Natural resolution or intervention for fluid collections in acute severe pancreatitis.

Sarathi Patra P[1], Das K, Bhattacharyya A, Ray S, Hembram J, Sanyal S, Dhali GK.

Outcome of acute pancreatitis and peripancreatic collections. Ann Surg 2018

INDICACIONES DE TRATAMIENTO

¿CUÁNDO HAY QUE TRATAR?

SÍNTOMAS -Vómitos (obstrucción al vaciamiento gástrico, compresión duodenal) -Dolor abdominal persistente, saciedad precoz
Obstrucción biliar Compresión vascular
INFECCIÓN con evolución desfavorable
CRECIMIENTO ⚠ pseudoaneurisma

We recommend drainage of symptomatic pancreatic pseudocysts. ⊕⊕⊕○
We suggest drainage of rapidly enlarging pancreatic pseudocysts. ⊕⊕○○
We recommend drainage of all infected PFCs in patients who fail to improve with conservative management alone. ⊕⊕⊕⊕

GUIDELINE

The role of endoscopy in the diagnosis and treatment of inflammatory pancreatic fluid collections 2016

INDICACIONES DE TRATAMIENTO

¿EN QUÉ MOMENTO HAY QUE TRATAR?

Si es posible, esperar a que la colección se encapsule (3-4 semanas)

RECOMMENDATION
ESGE suggests delaying the first intervention for 4 weeks if tolerated by the patient.
Weak recommendation, low quality evidence.

ESGE 2018

We recommend waiting for maturation of the cyst wall of PFCs before endoscopic intervention. ⊕⊕⊕○

GUIDELINE

The role of endoscopy in the diagnosis and treatment of inflammatory pancreatic fluid collections 2016


Special situations
Types of drainage
Concepts
www
Endoscopic drainage
Plan B
Conclusions
Especialización en
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Do Not Intervene Early!

- Preferably **at least 4 weeks**
  - **after** mature wall formation (less mortality, technically easier, less organ sacrifice)
- Strong recommendation based on 1 RCT (surgery) and prospective studies

- Emphasized in 2 upcoming guidelines (ACG, IAP/APA in press)

Am J Surg 1997;173:71,
Gastroenterology 2011;141:1254,
Arch Surg 2007;142:1194,
Arch Surg 2010;145:817

When To Intervene Early?

- Acute compartment syndrome
- Perforation (necrosis of duodenum, colon)
- Clinical deterioration despite maximal medical support

Early intervention best using percutaneous catheter drainage

If open intervention, entry into the retroperitoneum and necrosectomy to be avoided

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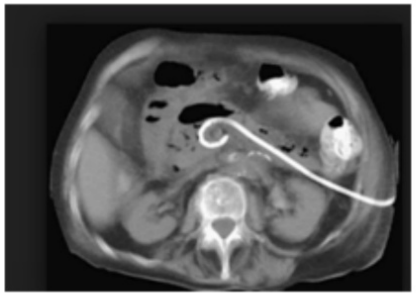
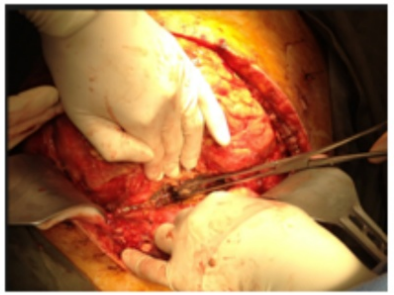
INDICACIONES DE TRATAMIENTO

¿CÓMO TRATAR?

- Endoscópico
- Percutáneo
- Quirúrgico



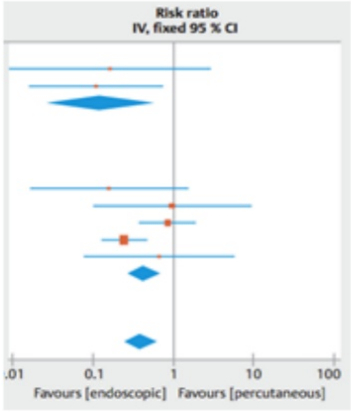


INDICACIONES DE TRATAMIENTO

¿CÓMO TRATAR?

- **ENDOSCÓPICO**
- Percutáneo

✓ Mayor éxito clínico
✓ Menor estancia hospitalaria
✓ Menor necesidad de cirugía



Original article

Endoscopic versus percutaneous management for symptomatic pancreatic fluid collections: a systematic review and meta-analysis

- **ENDOSCÓPICO**
- Quirúrgico

✓ Menos complicaciones
✓ Menor estancia hospitalaria
✓ Menor coste

Gastroenterology. 2013 Sep;145(3):583-90.e1. doi: 10.1053/j.gastro.2013.05.046. Epub 2013 May 31.

Equal efficacy of endoscopic and surgical cystogastrostomy for pancreatic pseudocyst drainage in a randomized trial.

Varadarajulu S[1], Bang JY, Sutton BS, Trevino JM, Christein JD, Wilcox CM.

Gastroenterology. 2018 Nov 16. pii: S0016-5085(18)35279-X. doi: 10.1053/j.gastro.2018.11.031. [Epub ahead of print]

An Endoscopic Transluminal Approach, Compared to Minimally Invasive Surgery, Reduces Complications and Costs for Patients With Necrotizing Pancreatitis.

Bang JY[1], Arnoletti JP[2], Holt BA[1], Sutton B[1], Hasan MK[1], Navaneethan U[1], Feranec N[3], Wilcox CM[4], Tharian B[1], Hawes RH[1], Varadarajulu S[5].

Lancet. 2018 Jan 6;391(10115):51-58. doi: 10.1016/S0140-6736(17)32404-2. Epub 2017 Nov 3.

Endoscopic or surgical step-up approach for infected necrotising pancreatitis: a multicentre randomised trial.

van Brunschot S[1], van Grinsven J[2], van Santvoort HC[3], Bakker OJ[4], Besselink MG[5], Boermeester MA[6], Bollen TL[6], Bosscha K[7], Bouwense SA[8], Bruno MJ[9], Cappendijk VC[10], Consten EC[11], Dejong CH[12], van Eijck CH[13], Erkelens WG[14], van Goor H[8], van Grevenstein WMU[4], Haveman JW[15], Hofker SH[15], Jansen JM[16], Laméris JS[17], van Lienden KP[17], Meijssen MA[18], Mulder CJ[19], Nieuwenhuijs VB[20], Poley JW[9], Quispel R[21], de Ridder R[22], Römkens TE[23], Scheepers JJ[24], Scheepers NJ[8], Schwartz MP[25], Seerden T[26], Spanier BWM[27], Straathof JWA[28], Strijker M[5], Timmer R[29], Venneman NG[30], Vleggaar FP[31], Voermans RP[32], Witteman BJ[33], Gooszen HG[34], Dijkgraaf MG[35], Fockens P[32]; Dutch Pancreatitis Study Group.

EUS 2008 Working Group document: evaluation of EUS-guided drainage of pancreatic-fluid collections (with video)

Stefan Seewald, MD, Tiing Leong Ang, MD, Mitsuhira Kida, MD, Karl Yu Kim Teng, MD, Nib Soehendra, MD

Zurich, Switzerland, Singapore, Kanagawa, Japan, Hamburg, Germany

TABLE 1. Comparison of surgical, percutaneous, and endoscopic approaches

	Strengths	Disadvantages
Surgical therapy (cystogast…omy, cystojejunostomy, panc…ection, surgical or laparosco…omy, open and closed …cement of drainages)	(1) Effective drainage therapy, (2) able to perform more extensive necrosectomy in any place, (3) able to address anatomical consequences of primary underlying disease, such as pancreatic-duct stricture, disconnected-duct syndrome, fistula, and (4) important role as salvage therapy in unsuccessful percutaneous or endoscopic drainage	(1) Invasive, (2) high morbidity and mortality, and (3) longer hospital stay, longer intensive care unit stay
Percutaneous therapy (percuta… drainage placement)	(1) Less-in…imary approach and less…tive in patients wit… …reatic-fluid … adjunct … …ge whe… …is …accessible …y, (3) may be performed ir…ents too unstable to undergo endoscopic drainage	(1) Potential local complications, such as bleeding, injury of viscera, and cutaneous infections, (2) inadequate in presence of necrotic debris
Endoscopic therapy (endoluminal drainage placement, endoscopic necrosectomy, pancreatic-duct stenting, and fistula sealing)	(1) Less-invasive primary alternative to surgical drainage, with comparable results, (2) less-invasive alternative in patients with postoperative pancreatic-fluid collections, (3) able to effectively treat necrotic collections with endoscopic necrosectomy, and (4) completely organ preserving compared with surgery	(1) Only possible if the pancreatic-fluid collection is encapsulated and adjacent to the gastric or duodenal wall, (2) multiple endoscopic sessions required, and (3) may only be a temporary measure if the underlying anatomical predisposition needs surgical correction.
(A) Non–EUS drainage		(1) Unable to drain collections in the absence of endoscopic bulging, (2) unable to exclude interposed vessels before drainage, with potential risk for bleeding, and (3) potential for misdiagnosing cystic tumor and pancreatic-fluid collection.
(B) EUS-guided endoscopic drainage	(1) Able to characterize the type of pancreatic-fluid collection and more accurately distinguish between cystic tumor and pseudocyst before drainage, (2) facilitate drainage in absence of endoscopic bulging, and (3) avoids interposed blood vessels through Doppler US	(1) Limited available equipment and accessories

RESCATE

Early Treatment

FAR AWAY

Combined Therapy

Always

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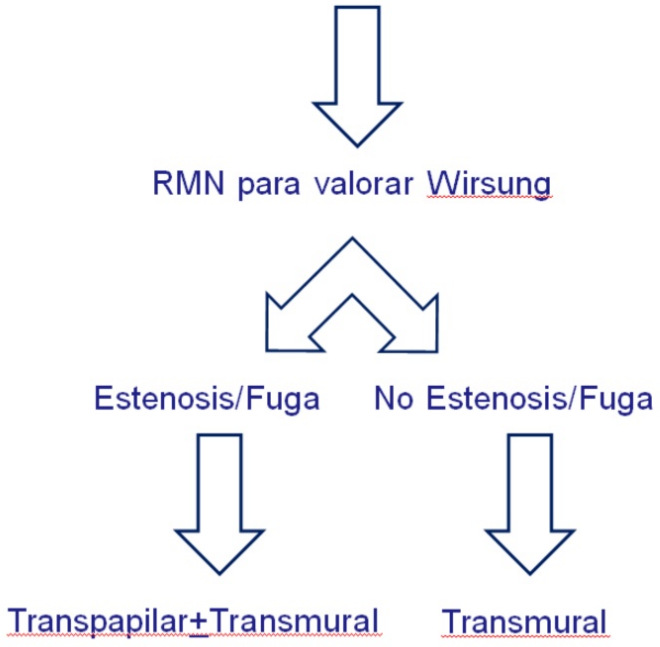
Drenaje endoscópico

¿Transpapilar o Transmural?



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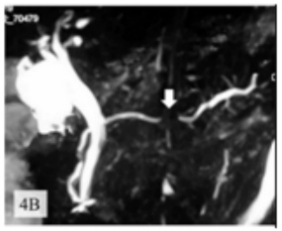
PROCEDIMIENTO

ANTES DEL PROCEDIMIENTO

- ✓ Colección **> 3 cm**
- ✓ Distancia **< 1 cm** colección-pared intestinal
- ✓ **Valorar la integridad del conducto pancreático principal**



- ✓ INR **< 1,5** plaquetas **> 50.000**
- ✓ Suspensión **antitrombóticos** (*AAS 100mg)
- ✓ **Antibioterapia profiláctica** (ciprofloxacino 400mg iv)

Higher-risk procedures
Polypectomy
Biliary or pancreatic sphincterotomy
Treatment of varices
PEG placement*
Therapeutic balloon-assisted enteroscopy
EUS with FNA†
Endoscopic hemostasis
Tumor ablation
Cystgastrostomy
Ampullary resection
EMR
Endoscopic submucosal dissection
Pneumatic or bougie dilation
PEJ

Endoscopic management of acute necrotizing pancreatitis. ESGE evidence-based guidelines. Endoscopy 2018
The role of endoscopy in the diagnosis and treatment of inflammatory pancreaeetic fluid collections. Gastrointest Endosc 2016

PROCEDIMIENTO

- ✓ Sedación/IOT (*colecciones grandes)
- ✓ Guiado por USE

RECOMMENDATION
ESGE recommends that EUS-guided access should be preferred over conventional transmural drainage for initial endoscopic transmural drainage.
Strong recommendation, moderate quality evidence.

ESGE 2018

Gastrointest Endosc. 2008 Dec;68(6):1102-11. doi: 10.1016/j.gie.2008.04.028. Epub 2008 Jul 21.

Prospective randomized trial comparing EUS and EGD for transmural drainage of pancreatic pseudocysts (with videos).

Varadarajulu S[1], Christein JD, Tamhane A, Drelichman ER, Wilcox CM.

Endoscopy. 2009 Oct;41(10):842-8. doi: 10.1055/s-0029-1215133. Epub 2009 Oct 1.

Endoscopic ultrasound-guided versus conventional transmural drainage for pancreatic pseudocysts: a prospective randomized trial.

Park DH[1], Lee SS, Moon SH, Choi SY, Jung SW, Seo DW, Lee SK, Kim MH.

- ✓ Mayor éxito técnico
- ✓ Menos complicaciones

- ✓ CO2

RECOMMENDATION
ESGE recommends exclusive use of CO_2 instead of air for insufflation during necrosectomy to reduce the risk of gas embolism.
Strong recommendation, low quality evidence.

ESGE 2018

EDITORIAL: Con

Drainage of pancreatic fluid collections: is EUS really necessary?

Todd H. Baron, MD, FASGE
Department of Medicine
Division of Gastroenterology and Hepatology
Mayo Clinic College of Medicine
Rochester, Minnesota, USA

EDITORIAL: Pro

Drainage of peripancreatic-fluid collections: is EUS really necessary?

Enrique Vazquez-Sequeiros, MD, PhD
Department of Gastroenterology
Hospital Universitario Ramón y Cajal
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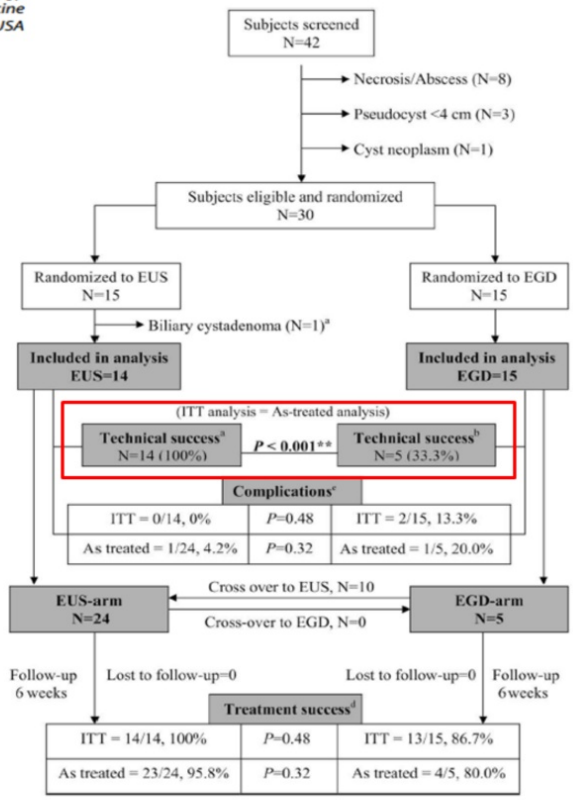
Madrid, Spain

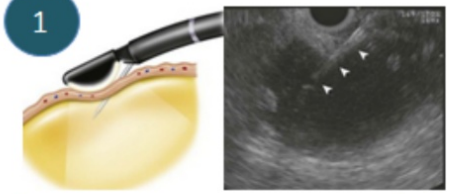
reatic pseudocysts — Vara



Varadarajulu S. GIE 2008

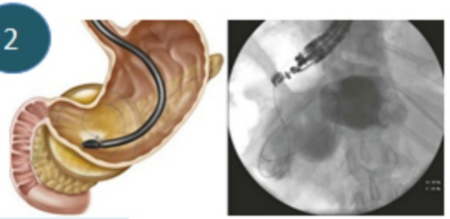
PROCEDIMIENTO

1



Aguja 19G → **GRAM y cultivo**

2

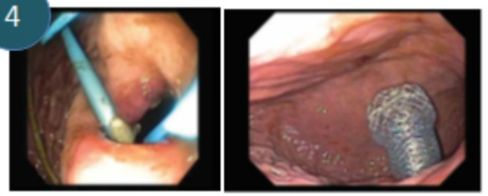


Guía 0.035

3

Cistotomo. Balón de dilatación

4



Colocación de prótesis

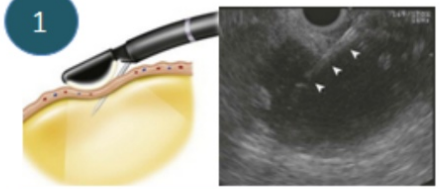
Control endoscópico, EUS, fluoroscópico

Guideline

Endoscopic management of acute necrotizing pancreatitis: European Society of Gastrointestinal Endoscopy (ESGE) evidence-based multidisciplinary guidelines

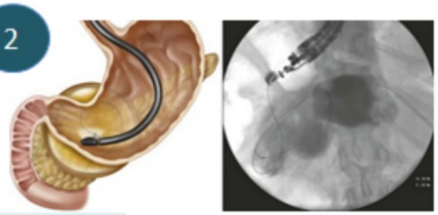
PROCEDIMIENTO

1



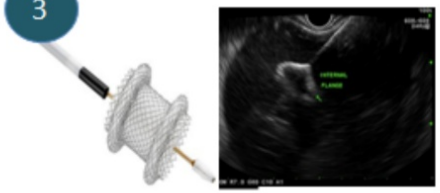
Aguja 19G → **GRAM y cultivo**

2



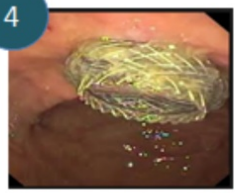
Guía 0.035

3



Electrocauterio en la punta

4

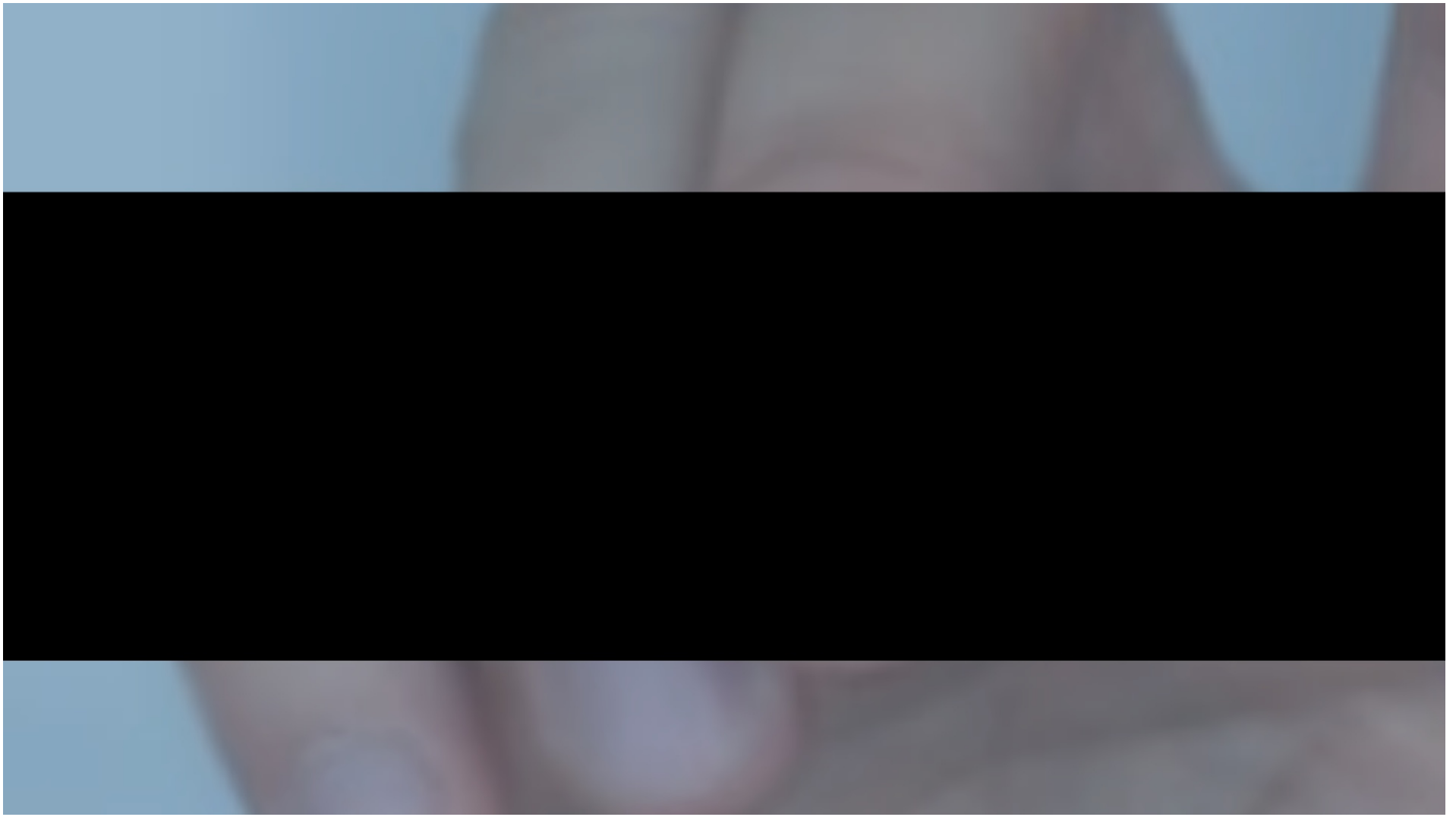


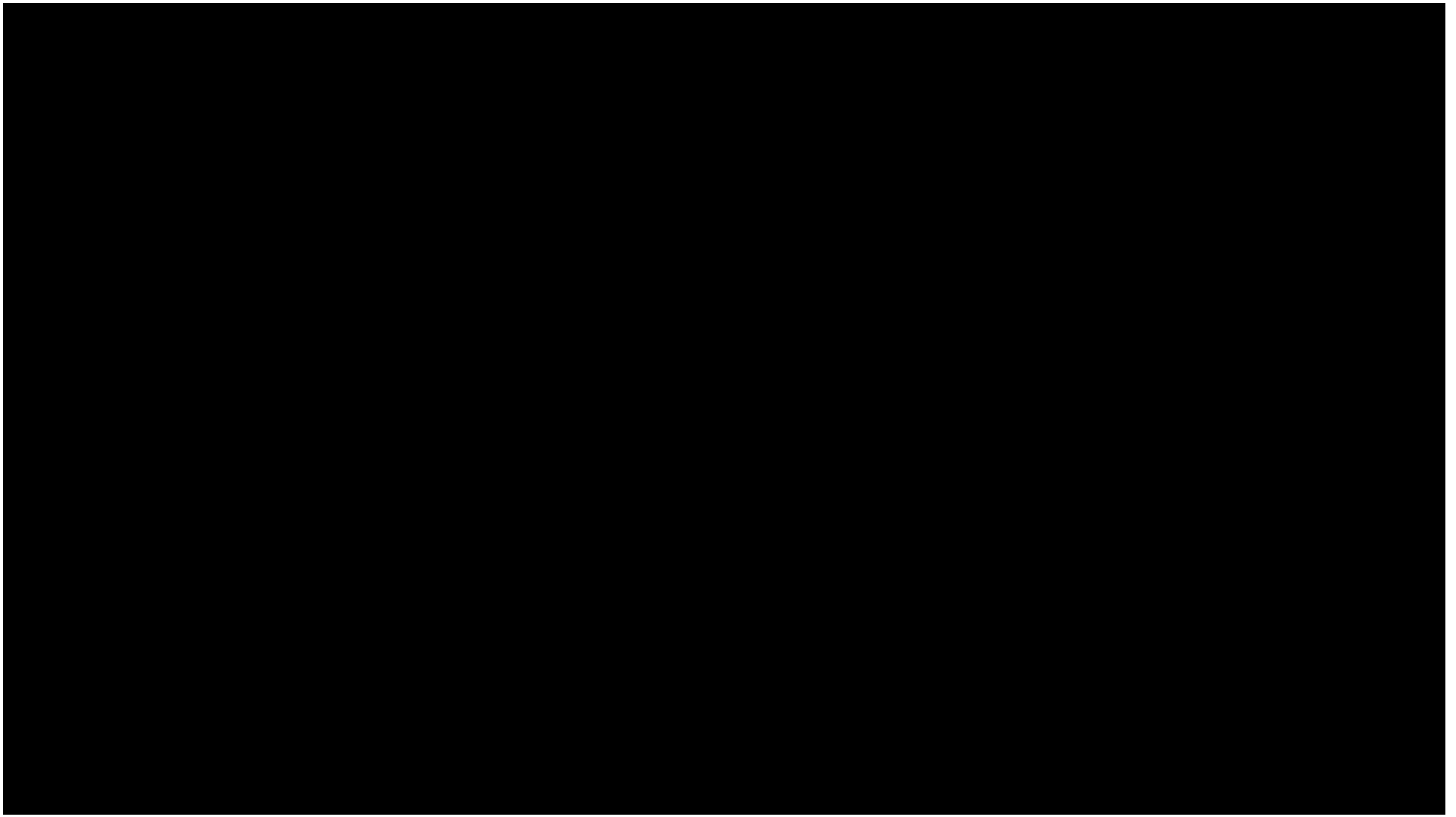
Liberación de prótesis

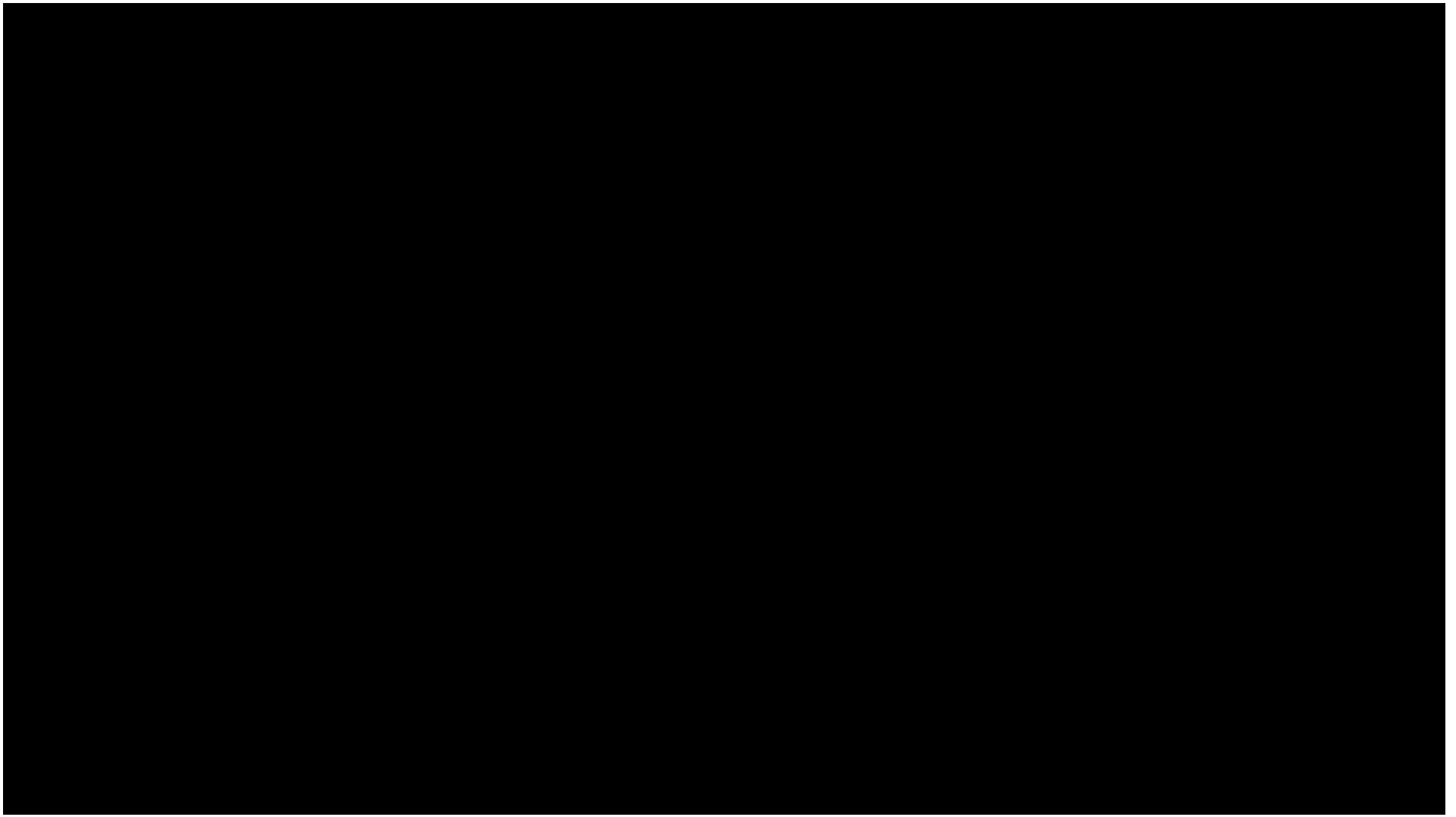
Control endoscópico, EUS, (fluoroscópico)

Guideline

Endoscopic management of acute necrotizing pancreatitis: European Society of Gastrointestinal Endoscopy (ESGE) evidence-based multidisciplinary guidelines

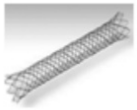






PROCEDIMIENTO

TIPO DE PRÓTESIS

Prótesis PLÁSTICAS	7-10 Fr		-Precio -Bajo riesgo migración -Más experiencia
			-Complejidad técnica (varias prótesis) -Diámetro (obstrucción)
Prótesis METÁLICAS			
1. Biliares rectas totalmente recubiertas **2. Esofágicas**	6-10 mm		-Diámetro -Menor complejidad técnica
			-No anclaje (migración PIG-TAIL COAXIAL) -Excesiva longitud -Precio
3. Prótesis de aposición luminal (LAMS) AXIOS/HOT AXIOS	10, 15, 20 mm		-Diámetro -"Sencillez" técnica (duración, fluoroscopia) -Bajo riesgo migración -Facilita acceso a la colección (necrosectomía)
NAGI SPAXUS	10-20 mm 8,-20 mm		-Precio

TIPO DE PRÓTESIS

Estudio	n	Tipo de colección	Tipo de prótesis	Resultado
Bang et al. Dig Endosc 2015 **Revisión sistemática 17 estudios**	881	Pseudoquiste n=698 WON n=183	**Plástico** (n=702) Vs. **Metal** (n=173) (biliar, LAMS)	**No diferencias:** -Éxito clínico 81% vs 82% -Eventos adversos 16% vs 23% -Recurrencia 10% vs 9%
Lee et al. Endoscopy 2014 **EC unicéntrico**	50	Pseudoquiste n=36 WON n=14	**Plástico** (n=25) Vs, **Metal** (biliar) (n=25)	**No diferencias:** -Éxito clínico 90% vs 86% -Eventos adversos 8% vs 0% **Metal menor duración 15´vs 29´**
Navaneethan et al. Gastrointest Endosc 2014 **Revisión sistemática 14 estudios**	729	Pseudoquiste	**Plástico** (n=698) Vs. **Metal** (biliar) (n=91)	**No diferencias:** -Éxito clínico 89% vs 85% -Eventos adversos 17% vs 23%

Pseudoquiste éxito clínico > 80% independientemente del tipo de prótesis

PROCEDIMIENTO

TIPO DE PRÓTESIS

Estudio	n	Tipo de colección	Tipo de prótesis	Resultado
Bazerbachi et al. Gastrointest Endosc 2018 **Revisión sistemática 41 estudios****	2213	WON	**Plástico** (n=1202) Vs. **Metal** (n=1011) *LAMS n=871 *No LAMS n=140	**Metal:** **-Más éxito clínico 92% vs. 80%** **-Menos hemorragia 5% vs 12%** -Menos obstrucción 9% vs 17% -Menos perforación 2% vs 4% -Más migración 8% vs. 5%
Bang et al. Gut 2018 **EC unicéntrico**	60	WON	Plástico (n=29) Vs. LAMS (n=31)	**No diferencias:** -Éxito clínico -Nº procedimientos -Costes LAMS > eventos adversos** LAMS menor duración
U.S. National Library of Medicine ClinicalTrials.gov	**EUS-guided Transmural Drainage of Walled-off Pancreatic Necrosis: Plastic vs Metallic Protesis. (PROMETHEUS)**			

WON éxito clínico 50-85% ¿plástico o metal?

ESGE 2018

RECOMMENDATION

ESGE suggests either plastic stents or lumen-apposing metal stents for initial endoscopic transmural drainage; however, long-term data on lumen-apposing metal stents are still sparse.

Weak recommendation, moderate quality evidence.

Evaluation of the short- and long-term effectiveness and safety of fully covered self-expandable metal stents for drainage of pancreatic fluid collections: results of a Spanish nationwide registry

Enrique Vazquez-Sequeiros, MD, PhD,[1,2] Todd H. Baron, MD, FASGE,[3] Manuel Pérez-Miranda, MD,[4] Andres Sánchez-Yagüe, MD,[5,6] Joan Gornals, MD, PhD,[7] Ferran Gonzalez-Huix, MD,[8] Carlos de la Serna, MD,[4] Juan Angel Gonzalez Martin, MD,[1] Antonio Z. Gimeno-Garcia, MD, PhD,[9] Carlos Marra-Lopez, MD,[10] Ana Castellot, MD,[11] Fernando Alberca, MD,[12] Ignacio Fernandez-Urien, MD, PhD,[13] Jose Ramon Aparicio, MD,[14] Maria Luisa Legaz, MD,[15] Oriol Sendino, MD, PhD,[16] Carmen Loras, MD, PhD,[17] Jose Carlos Subtil, MD,[18] Juan Nerin, MD,[19] Mercedes Perez-Carreras, MD, PhD,[20] Jose Diaz-Tasende, MD,[20] Gustavo Perez, MD,[21] Alejandro Repiso, MD,[22] Angels Vilella, MD,[23] Carlos Dolz, MD,[23] Alberto Alvarez, MD,[24] Santiago Rodriguez, MD,[25] Jose Miguel Esteban, MD,[26] Diego Juzgado, MD,[2] Agustin Albillos, MD, PhD[1]
Spanish Group for FCSEMS in Pancreas Collections

TABLE 1. Baseline characteristics of 211 patients with a PFC treated by an FCSEMS

Characteristic	Value
Age, mean ± SD (range), y	58.1 ± 13.5 (46-79)
Sex, M/F, n (%)	146/65 (69/31)
Etiology, gallstone/alcohol/other, n (%)	103/82/26 (49/39/12)
Chronic pancreatitis, n (%)	53 (25)
Type of PFC, pseudocyst with debris/ WOPN, n (%)	112/99 (53/47)
Size of PFC, mean ± SD (range), mm	93.3 ± 35.7 (40-300)
Time since diagnosis, mean ± SD (range), d	65.5 ± 21.6 (36-480)
Previous failed drainage of PFC (any technique), n (%)	27 (13)
Type of PFC drainage, SBFCSEMS/LAMS, n (%)	139/72 (66/34)
Double pigtail plastic (+ FCSEMS), n (%)	110 (52)
Nasocystic lavage catheter (+ FCSEMS), n (%)	57 (27)
Necrosectomy (+ FCSEMS), n (%)	36 (17)

PFC, Pancreatic fluid collection; *FCSEMS*, fully covered self-expandable metal stent; *SD*, standard deviation; *WOPN*, walled-off pancreatic necrosis; *SBFCSEMS*, straight biliary fully covered self-expandable metal stent; *LAMS*, lumen-apposing metal stent.

Gastrointest Endosc 2016;84:450-7.

Evaluation of the short- and long-term effectiveness and safety of fully covered self-expandable metal stents for drainage of pancreatic fluid collections: results of a Spanish nationwide registry

TABLE 2. Performance characteristics of EUS-guided drainage of a PFC with an FCSEMS

Characteristic	Patients, n (%) (95% CI) (N = 211)
Technical success	205 (97) (93-99)
Short-term success	198 (94) (89-97)
Long-term success	178 (85) (79-89)
Treatment failure	33 (15) (11-21)
Re-treated surgically	15 (7) (4-11)
Re-treated endoscopically	11 (5) (3-9)
Re-treated percutaneously	7 (3) (1-7)
Adverse events*	44 (21) (16-27)
Infection/stent dysfunction†	23 (11) (7-16)
Bleeding‡	15 (7) (4-11)
Perforation/pneumoperitoneum	6 (3) (1-6)

PFC, Pancreatic fluid collection; *FCSEMS*, fully covered self-expandable metal stent; *CI*, confidence interval.
*Adverse events have been grouped by relevance to patient outcome in this table (although patients may have presented >1 adverse event, as shown in the text).
†Stent migration leading to dysfunction occurred in 10 patients (5%).
‡Bleeding at drainage: 1 patient. Bleeding in the first 6 months: 9 patients (endoscopic therapy), 4 patients (percutaneous therapy), 1 patient (surgery).

Gastrointest Endosc 2016;84:450-7

Lumen-apposing metal stents versus biliary fully-covered metal stents for EUS-guided drainage of pancreatic fluid collections: a case control study

Endoscopy International Open 2020; 08: E6–E12

Ana Garcia Garcia de Paredes[1], Juan Angel Gonzalez Martin[1], Jose Ramon Foruny Olcina[1], Diego Juzgado Lucas[2], Fernando Gonzalez Panizo[2], Sergio Lopez Duran[1], Alba Martinez Sanchez[1], Alfonso Sanjuanbenito[3], Alejandra Caminoa[4], Agustin Albillos[1], Enrique Vazquez-Sequeiros[1]

► **Table 1** Baseline characteristics of patients and pancreatic fluid collections.

	(Group A) EC-LAMS n = 30	(Group B) BFCSEMS n = 60	*P*
Sex masculine, n (%)	19 (63 %)	40 (67 %)	0.46
Age, mean ± SD, years	61.3 ± 10.2	63.1 ± 9.8	0.94
Etiology of pancreatitis, n (%)			
▪ Gallstone	21 (70 %)	45 (75 %)	0.6
▪ Alcohol	9 (30 %)	15 (25 %)	2
Chronic pancreatitis, n (%)	7 (23 %)	10 (17 %)	0.56
Type of PFC			
▪ Pseudocyst	14 (47 %)	32 (53 %)	0.8
▪ WON	16 (53 %)	28 (47 %)	7
Size of PFC, mean ± SD, mm	74.6 ± 14.5	73.9 ± 11.9	0.87
Time since diagnosis, mean ± SD, days	45.7 ± 8.2	43.8 ± 7.3	0.27
Previous drainage of PFC, n (%)	4 (13 %)	6 (10 %)	0.98

Lumen-apposing metal stents versus biliary fully-covered metal stents for EUS-guided drainage of pancreatic fluid collections: a case control study

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Ana Garcia Garcia de Paredes[1], Juan Angel Gonzalez Martin[1], Jose Ramon Foruny Olcina[1], Diego Juzgado Lucas[2], Fernando Gonzalez Panizo[2], Sergio Lopez Duran[1], Alba Martinez Sanchez[1], Alfonso Sanjuanbenito[3], Alejandra Caminoa[4], Agustin Albillos[1], Enrique Vazquez-Sequeiros[1]

▶ **Table 2** Clinical outcomes and adverse events.

	(Group A) EC-LAMS n = 30	(Group B) BFCSEMS n = 60	*P*
Technical success, n (%)	30 (100 %)	60 (100 %)	1
Procedure time < 30 minutes, n (%)	30 (100 %)	0 (0 %)	< 0.0001
Clinical success, n (%)	29 (96 %)	49 (82 %)	0.055
Need of surgery as rescue therapy, n (%)	0 (0 %)	3 (5 %)	0.29
Adverse events, n (%)	1 (4 %)	11 (18 %)	0.04
▪ Early (< 14 days)	1	9	
▪ Late (> 14 days)	0	2	
Procedure-related mortality, n (%)	0 (0 %)	0 (0 %)	1

PROCEDIMIENTO

OTROS ASPECTOS TÉCNICOS

Doble pig-tail coaxial

	LAMS n=21	LAMS+DPS n=20	*P* value
Global adverse events, n (%)	9 (42.9)	2 (10.0)	0.04
Bleeding, n (%)	5 (23.8)	1 (5.0)	0.18
Infection, n (%)	3 (14.3)	1 (5.0)	0.61
Hydro-pneumothorax, n (%)	1 (4.8)	0	>0.99
Timing of adverse events, n (%)			0.04
▪ Intraprocedure[1]	0	0	
▪ Post-procedure[2]	5 (23.8)	2 (10.0)	
▪ Late[3]	4 (19.0)	0	
Severity, n (%)			0.04
▪ Moderate	5 (23.8)	0	
▪ Severe	4 (19.0)	2 (10.0)	

Endoscopy. 2018 Mar 28. doi: 10.1055/a-0582-9127. [Epub ahead of print]

Safety of lumen-apposing stent with or without coaxial plastic stent for endoscopic ultrasound-guided drainage of pancreatic fluid collections: a retrospective study.

Puga M[#1,2], Consiglieri CF[#2], Busquets J[#3], Pallarès N[#4], Secanella L[#3], Peláez N[#3], Fabregat J[#3], Castellote J[#5], Gornals JB[2].

COMPLICACIONES

Hemorragia (inmediata/diferida)	**0,5-13%**
Perforación retroperitoneal	**1-4%** *proceso uncinado *distancia pared-colección
Obstrucción de la prótesis	**2-20%**
Migración de la prótesis (interna/externa)	**0,5-15%**
Embolia gaseosa	**0,9-2%** *aire

Metal stents versus plastic stents for the management of WON: a systematic review and metanalysis. Gastrointestinal Endoscopy 2018
Endoscopic management of acute necrotizing pancreatitis. ESGE evidence-based guidelines. Endoscopy 2018
Frecuency of complications during EUS-guided drainage of pancreatic fluid collections in148 consecutive patients. Journal of Gastroenterology and Hepatology 2011

PROCEDIMIENTO **DESPUÉS DEL PROCEDIMIENTO**

- ✓ Ayunas 24 horas. Posteriormente **dieta oral si tolera**
- ✓ **Antibioterapia profiláctica** (ciprofloxacino 500mg/12h vo 3-5 días)
- ✓ Drenaje nasoquístico
  500 cc SSF/día ---> 2000 cc SSF/día en función de tolerancia
- ✓ ¿IBP?

Discontinuation of PPIS Reduces the Number of Endoscopic Procedures Required for Resolution of Walled-Off Pancreatic Necrosis

Reem Z. Sharaiha[3], Grace Yang[1], Amy Javia[1], Cynthia Edirisuriya[1], Arish Noor[1], Tayebah Mumtaz[1], Usama Iqbal[1], David E. Loren[1], Thomas E. Kowalski[1], Douglas G. Adler[2], Natalie Cosgrove[1], Yordano Alicea[4], Amy Tyberg[3], Enad Dawod[3], Aleksey A. Novikov[3], Iman Andalib[3], Michel Kahaleh[3], Ali Siddiqui*[1]

- ✓ NUTRICIÓN (soporte nutricional, enzimas pancreáticas…)

SEGUIMIENTO

- Prueba de imagen (TC/RM) **4-6 semanas** tras el procedimiento

- ¿Cuándo retirar la prótesis?

  pronto → recurrencia
  tarde → eventos adversos

RECOMMENDATION
ESGE recommends retrieval of lumen-apposing metal stents within 4 weeks to prevent stent-related adverse effects, and long-term indwelling of double-pigtail plastic stents in patients with disconnected pancreatic duct syndrome.
Strong recommendation, low quality evidence.

ESGE 2018

Especialización en
Ultrasonografía Endoscópica Avanzada

DIGESTIVO RAMON Y CAJAL MADRID

Título propio
Universidad de Alcalá

DRENAJE DE COLECCIONES PANCREATICAS

Enrique Vázquez Sequeiros
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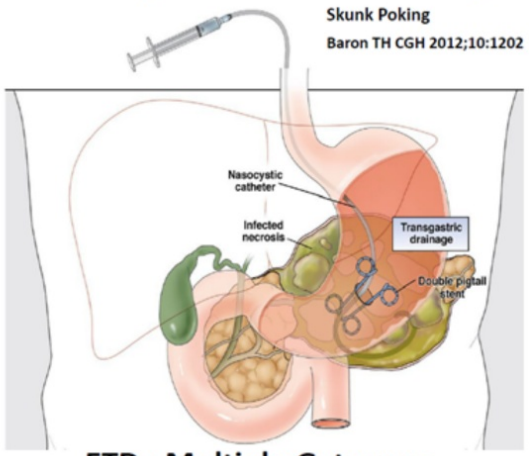
Hospital Universitario Ramón y Cajal. IRYCIS. Madrid.

Hospital Universitario Ramón y Cajal

Endoscopic Transluminal Drainage

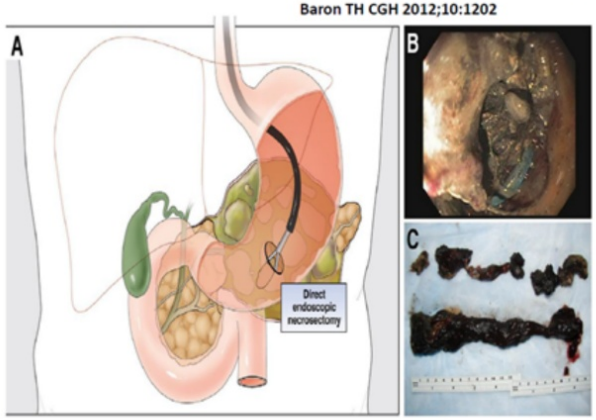
Skunk Poking

Baron TH CGH 2012;10:1202



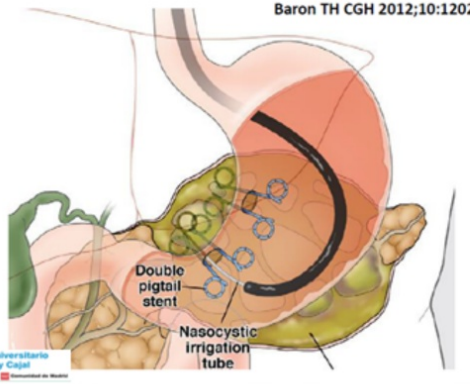
Endoscopic Transluminal Necrosectomy

Baron TH CGH 2012;10:1202



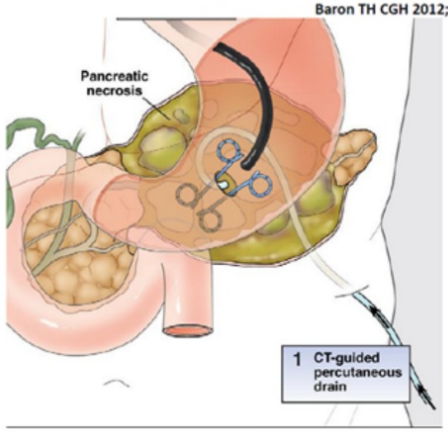
ETD : Multiple Gateways (Varadarajulu S, Birmingham)

Baron TH CGH 2012;10:1202



Hybrid ETD + PTD(Gluck, Virginia Mason)

Baron TH CGH 2012;10:1202



Hospital Universitario Ramón y Cajal

PROCEDIMIENTO

OTROS ASPECTOS TÉCNICOS

Drenaje nasoquístico

5-7 Fr
Infusión continua de SSF (500 cc--> 2000 cc/día)

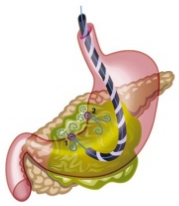
No estudios específicamente dirigidos a evaluar su utilidad

PROCEDIMIENTO

OTROS ASPECTOS TÉCNICOS

Abordaje múltiple

Estudio	Nº pacientes	Orificios multiples	Orificio único	Éxito clínico
Varadarajulu 2011	60 (WON)	12	48	91% vs. 52%, p=0.002
Bang 2013	76 (WON)	18	58	94% vs. 62% p=0.009
Mukai 2015	75 (WON)	11	64	



Gastrointest Endosc. 2011 Jul;74(1):74-80. doi: 10.1016/j.gie.2011.03.1122. Epub 2011 May 25.

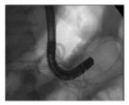
Multiple transluminal gateway technique for EUS-guided drainage of symptomatic walled-off pancreatic necrosis.

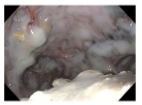
Varadarajulu S[1], Phadnis MA, Christein JD, Wilcox CM.

RECOMMENDATION
ESGE suggests drainage of walled-off necrosis using the single transluminal gateway technique; the multiple transluminal gateway technique should be considered in patients with either multiple or large (> 12 cm) walled-off necrosis, or in the case of suboptimal response to single transluminal gateway drainage.
Weak recommendation, low quality evidence.

PROCEDIMIENTO

NECROSECTOMÍA ENDOSCÓPICA





2018 ESGE

- ¿Siempre?
- ¿En qué momento?
- ¿Cómo hacerla?
- ¿Nº de sesiones, frecuencia?

RECOMMENDATION
ESGE suggests that, in the absence of improvement following endoscopic transmural drainage of walled-off necrosis, endoscopic necrosectomy or minimally invasive surgery (if percutaneous drainage has already been performed) is to be preferred over open surgery as the next therapeutic step, taking into account the location of the walled-off necrosis and local expertise.
Weak recommendation, low quality evidence.

36% eventos adversos
4 (1-23) sesiones

Surg Endosc. 2014 May;28(5):1425-38. doi: 10.1007/s00464-013-3382-9. Epub 2014 Jan 8.

Endoscopic transluminal necrosectomy in necrotising pancreatitis: a systematic review.

van Brunschot S[1], Fockens P, Bakker OJ, Besselink MG, Voermans RP, Poley JW, Gooszen HG, Bruno M, van Santvoort HC.

Factores predictores de necesidad de necrosectomía
-Tamaño WON -Cantidad de contenido sólido

Endoscopic management of acute necrotizing pancreatitis. ESGE evidence-based guidelines. Endoscopy 2018
Do the morphological features of walled off pancreatic necrosis on endoscopic ultrasound determine the outcome of transmural drainage? Endosc Ultrosound 2014

PROCEDIMIENTO

OTROS ASPECTOS TÉCNICOS

Antibioterapia intracolección

Pancreatology. 2018 Sep;18(6):642-646. doi: 10.1016/j.pan.2018.06.005. Epub 2018 Jun 20.

Evaluation of local instillation of antibiotics in infected walled-off pancreatic necrosis.

Werge M[1], Novovic S[2], Rosa S[3], Knudsen JD[4], Fabricius E[2], Glud LL[2], Schmidt PN[2].

Irrigación con agua

Surg Endosc. 2016 Jun;30(6):2592-602. doi: 10.1007/s00464-015-4535-2. Epub 2015 Sep 3.

Endoscopic necrosectomy of walled-off pancreatic necrosis using a lumen-apposing metal stent and irrigation technique.

Gornals JB[1], Consiglieri CF[2], Busquets J[3], Salord S[3], de-la-Hera M[4], Secanella L[1], Redondo S[4], Peláez N[4], Fábregat J[3].

H2O2

Dig Dis Sci. 2014 Mar;59(3):687-90. doi: 10.1007/s10620-013-2945-x. Epub 2013 Nov 27.

Hydrogen peroxide-assisted endoscopic necrosectomy for walled-off pancreatic necrosis: a dual center pilot experience.

Siddiqui AA[1], Easler J, Strongin A, Shivka A, Kowalski TE, Muddana V, Chennat J, Baron TH, Loren DE, Papachristou GI.

Esponja

Endoscopy. 2012;44 Suppl 2 UCTN:E49-50. doi: 10.1055/s-0031-1291525. Epub 2012 Mar 6.

Endoscopic vacuum-assisted therapy of infected pancreatic pseudocyst using a coated sponge.

Wallstabe I[1], Tiedemann A, Schiefke I.

RECOMMENDATION
ESGE suggests restraint regarding the use of high-flow water-jet systems, hydrogen peroxide, or vacuum-assisted closure systems to facilitate debridement of necrosis in walled-off necrosis because of insufficient evidence.
Weak recommendation, low quality evidence.

ESGE 2018

Colección semisólida

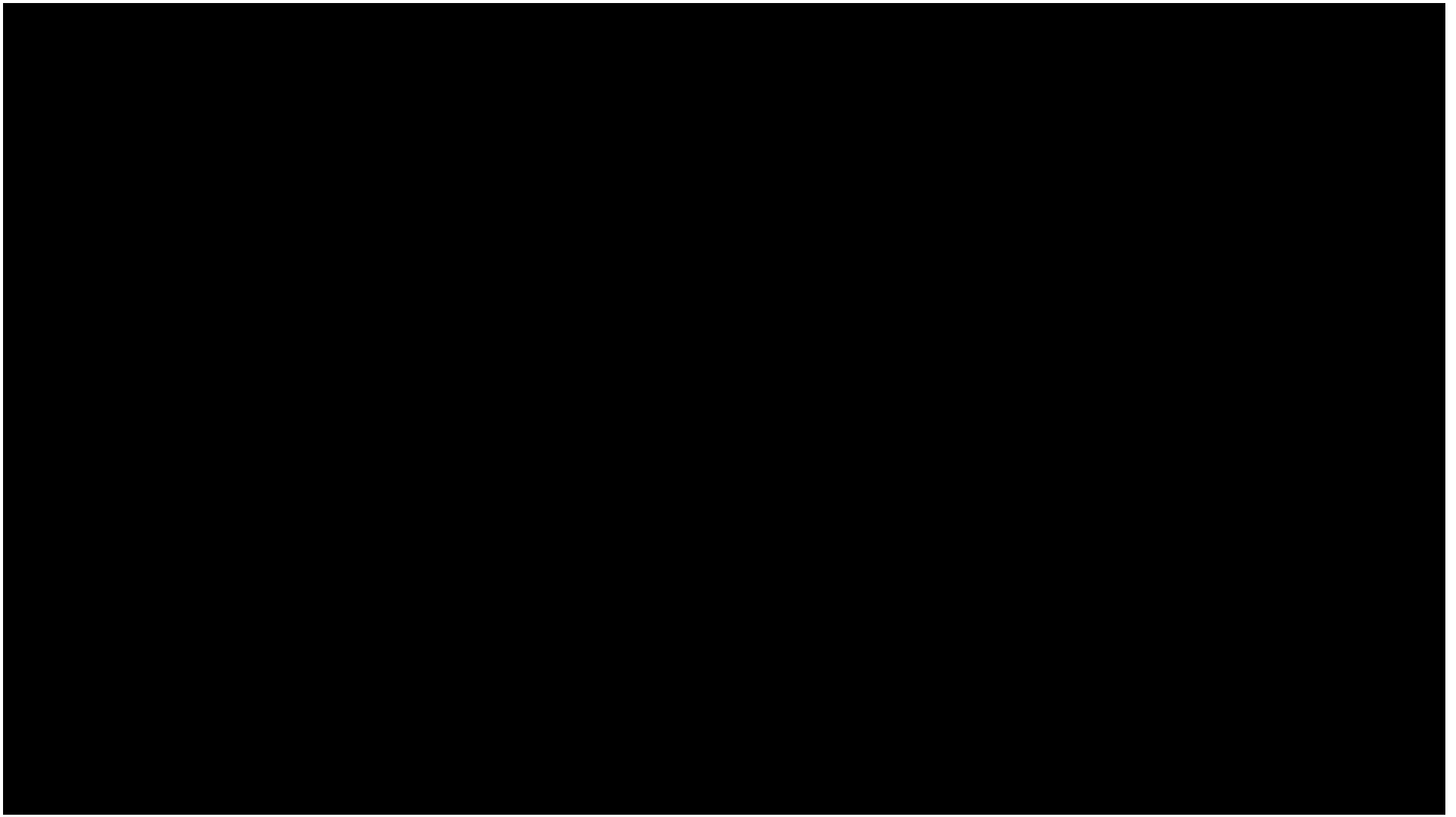
[redacted]

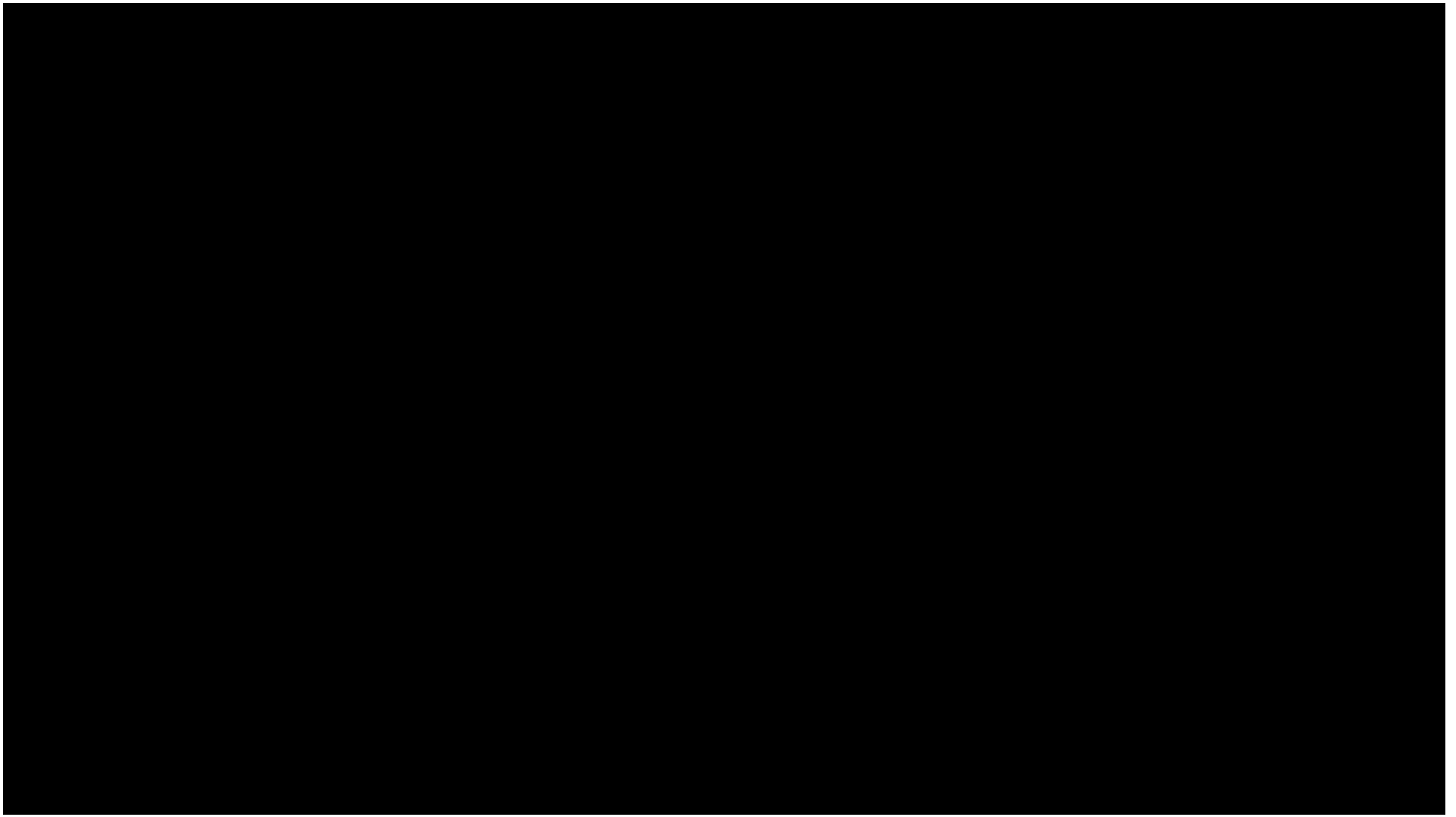
Hemorragia

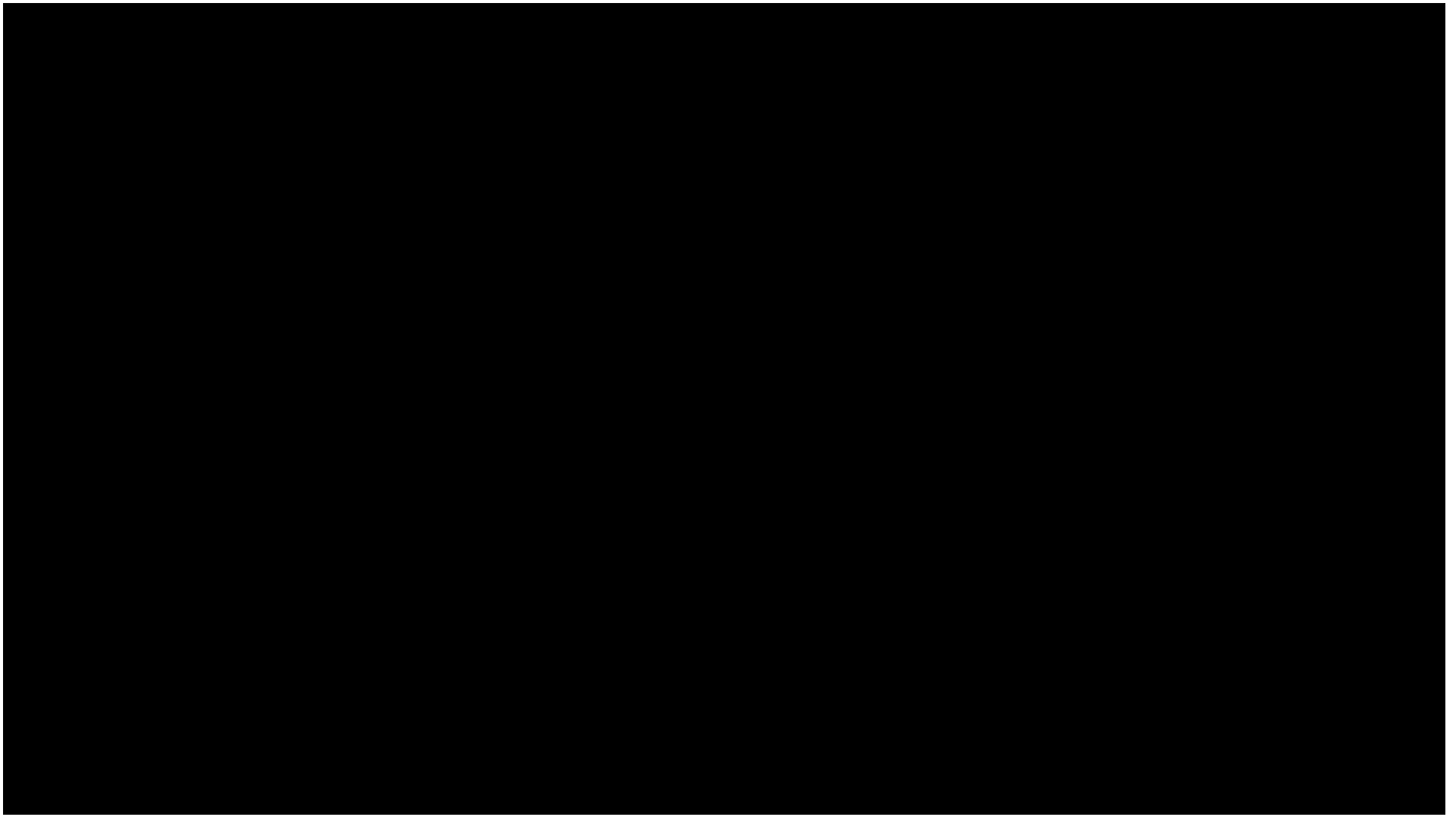
[redacted]

Migración prótesis

[redacted]







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SaludMadrid
Hospital Universitario Ramón y Cajal
Comunidad de Madrid

Conclusiones

1. Drenaje USE: eficaz y seguro
2. LASEMS*: rapidez, facilidad, eficacia
3. Casos complicados: abordaje multidisciplinar
4. Complicaciones:
   a) Conocer
   b) Disponer de soluciones

Hospital Universitario Ramón y Cajal

Management of pancreatic collections: an update

Ana García García de Paredes, Sergio López-Durán, José Ramón Foruny, Agustín Albillos and Enrique Vázquez-Sequeiros

Department of Gastroenterology and Hepatology. Hospital Universitario Ramón y Cajal. Universidad de Alcalá. IRYCIS. Madrid, Spain

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