2019 CAPER Collaborative Alliance for Pancreatic Education and Research

PANCREAS ACADEMY

July 24, 2019

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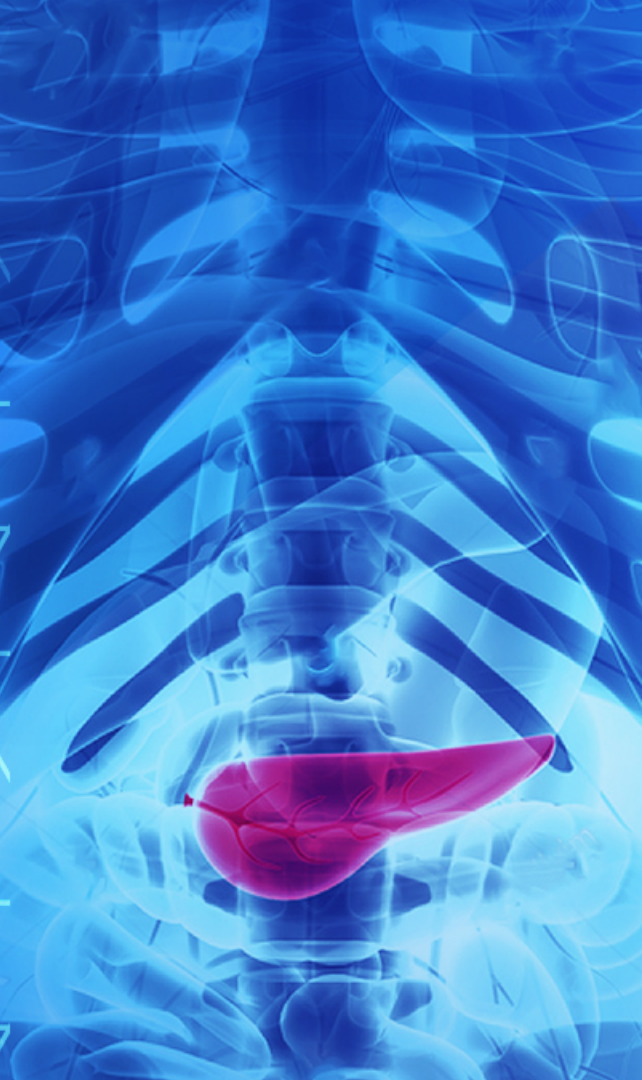


Surgical Principles in Managing Acute & Chronic Pancreatitis

Steven J Hughes, MD, FACS

Edward M. Copeland, III, MD Professor of Surgery

Vice-Chairman, General Surgery

University of Florida College of Medicine

Disclosures

I, Steven J Hughes, MD have no conflicts of interest to disclose.

Objectives

- Idiopathic pancreatitis is often biliary pancreatitis
- Review the PONCHO trial
- Understand “best practices” for necrotizing pancreatitis
- Recognize the Disconnected Pancreatic Duct
- Review results of surgical treatment of chronic pancreatitis

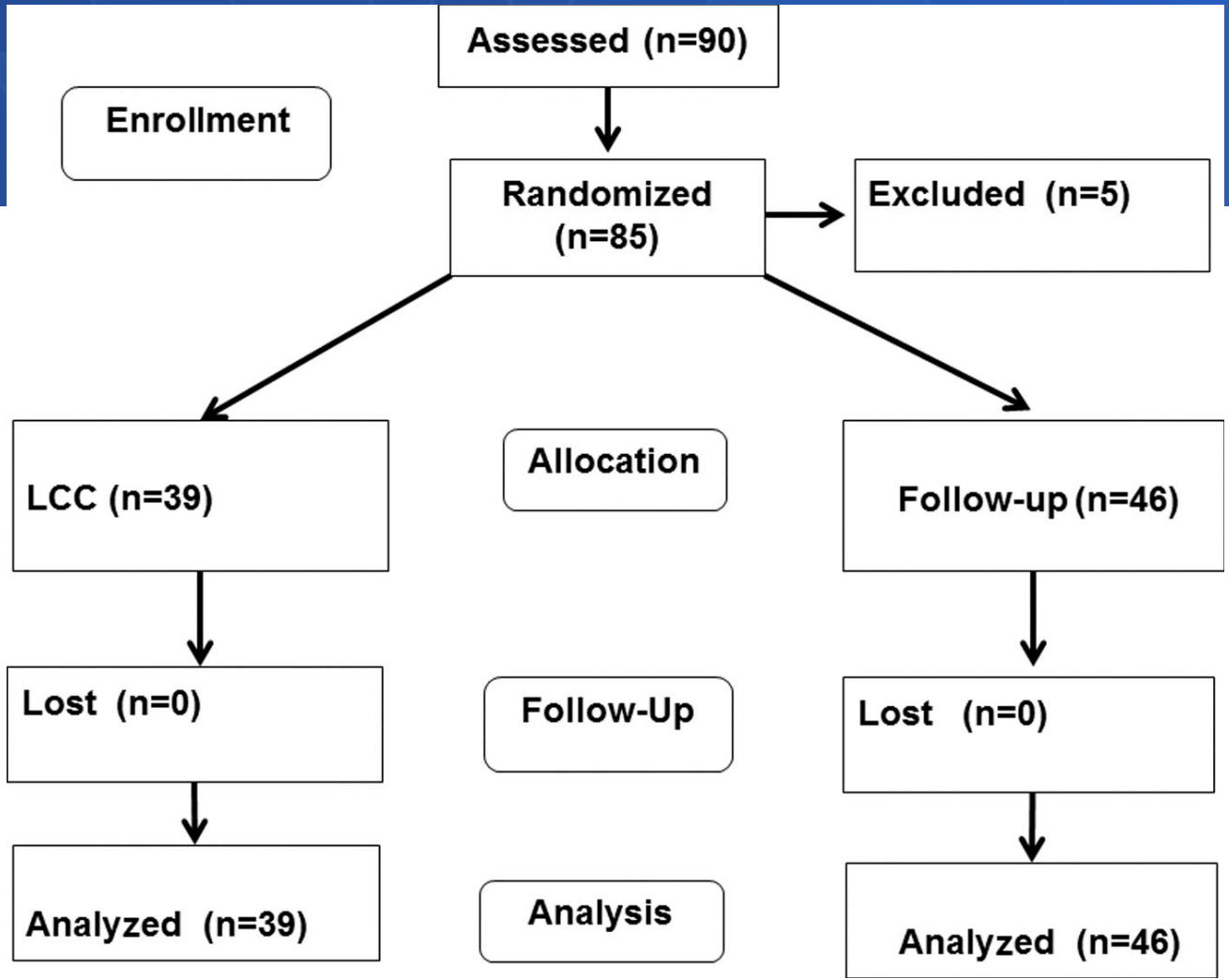
PAPER OF THE 22ND ANNUAL ESA MEETING

Can Laparoscopic Cholecystectomy Prevent Recurrent Idiopathic Acute Pancreatitis?

A Prospective Randomized Multicenter Trial

Sari Räty, MD, Jukka Pulkkinen, MD,† Isto Nordback, MD,* Juhani Sand, MD,* Mikael Victorzon, MD,‡ Juha Grönroos, MD,§ Heli Helminen, MD,¶ Pekka Kuusanmäki, MD,|| Pia Nordström, MD,* and Hannu Paajanen, MD†***

Ann Surg 2015;262:736–741


Assessed (n=90)
Enrollment
Randomized (n=85)
Excluded (n=5)
LCC (n=39)
Allocation
Follow-up (n=46)
Lost (n=0)
Follow-Up
Lost (n=0)
Analyzed (n=39)
Analysis
Analyzed (n=46)

Results: During a median follow-up of 36 (5–58) months, the recurrence of IAP was significantly higher in the control group than in LCC group (14/46 vs. 4/39, P = 0.016), as was also the number of recurrences (23/46 vs. 8/39, P = 0.003). During surgery, 23/39 (59%) of the gallbladders were found to contain biliary stones or sludge.

Summary: Up to 50% to 75% of IAP may be due to microlithiasis, which is undetectable by conventional imaging methods.

A total of 5 patients needed to be treated (NNT-value) to prevent 1 IAP.

Same-admission versus interval cholecystectomy for mild gallstone pancreatitis (PONCHO): a multicentre randomised controlled trial

David W da Costa, Stefan A Bouwense*, Nicolien J Schepers, Marc G Besselink, Hjalmar C van Santvoort, Sandra van Brunschot, Olaf J Bakker, Thomas L Bollen, Cornelis H Dejong, Harry van Goor, Marja A Boermeester, Marco J Bruno, Casper H van Eijck, Robin Timmer, Bas L Weusten, Esther C Consten, Menno A Brink, B W Marcel Spanier, Ernst Jan Spillenaar Bilgen, Vincent B Nieuwenhuijs, H Sijbrand Hofker, Camiel Rosman, Annet M Voorburg, Koop Bosscha, Peter van Duijvendijk, Jos J Gerritsen, Joos Heisterkamp, Ignace H de Hingh, Ben J Witteman, Philip M Kruyt, Joris J Scheepers, I Quintus Molenaar, Alexander F Schaapherder, Eric R Manusama, Laurens A van der Waaij, Jacco van Unen, Marcel G Dijkgraaf, Bert van Ramshorst, Hein G Gooszen, Djamila Boerma, for the Dutch Pancreatitis Study Group*

Lancet. 2015 Sep 26;386(10000):1261-8

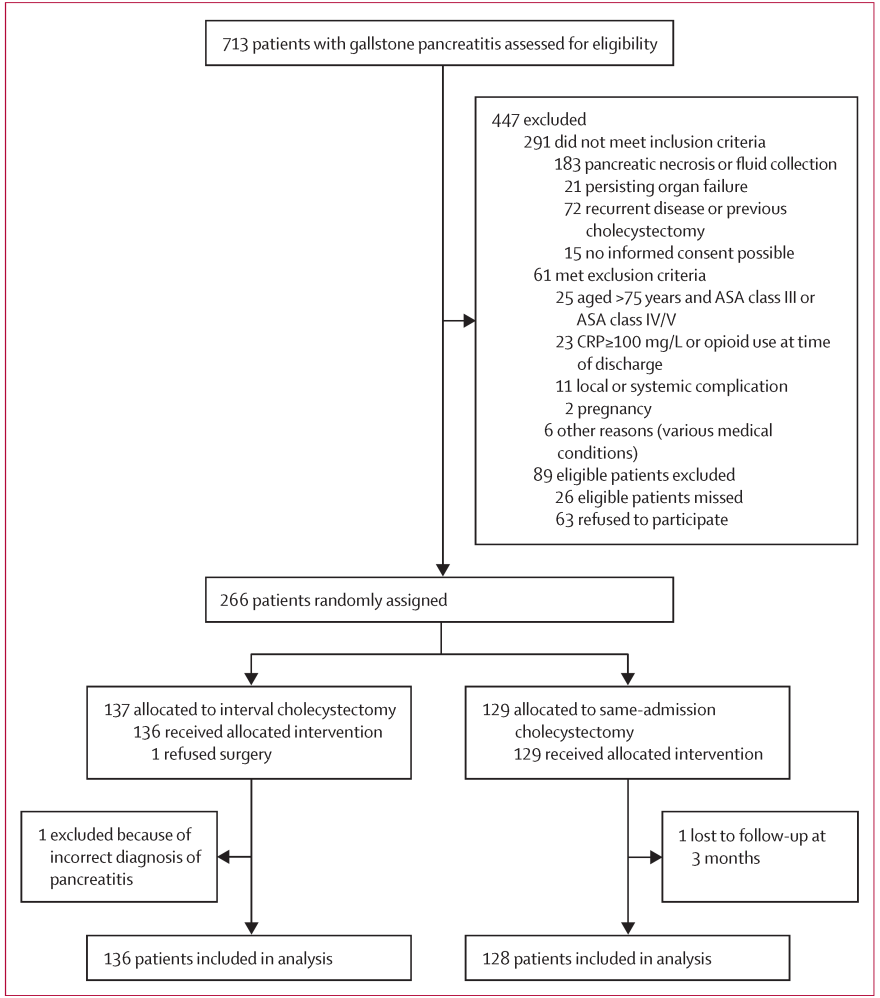


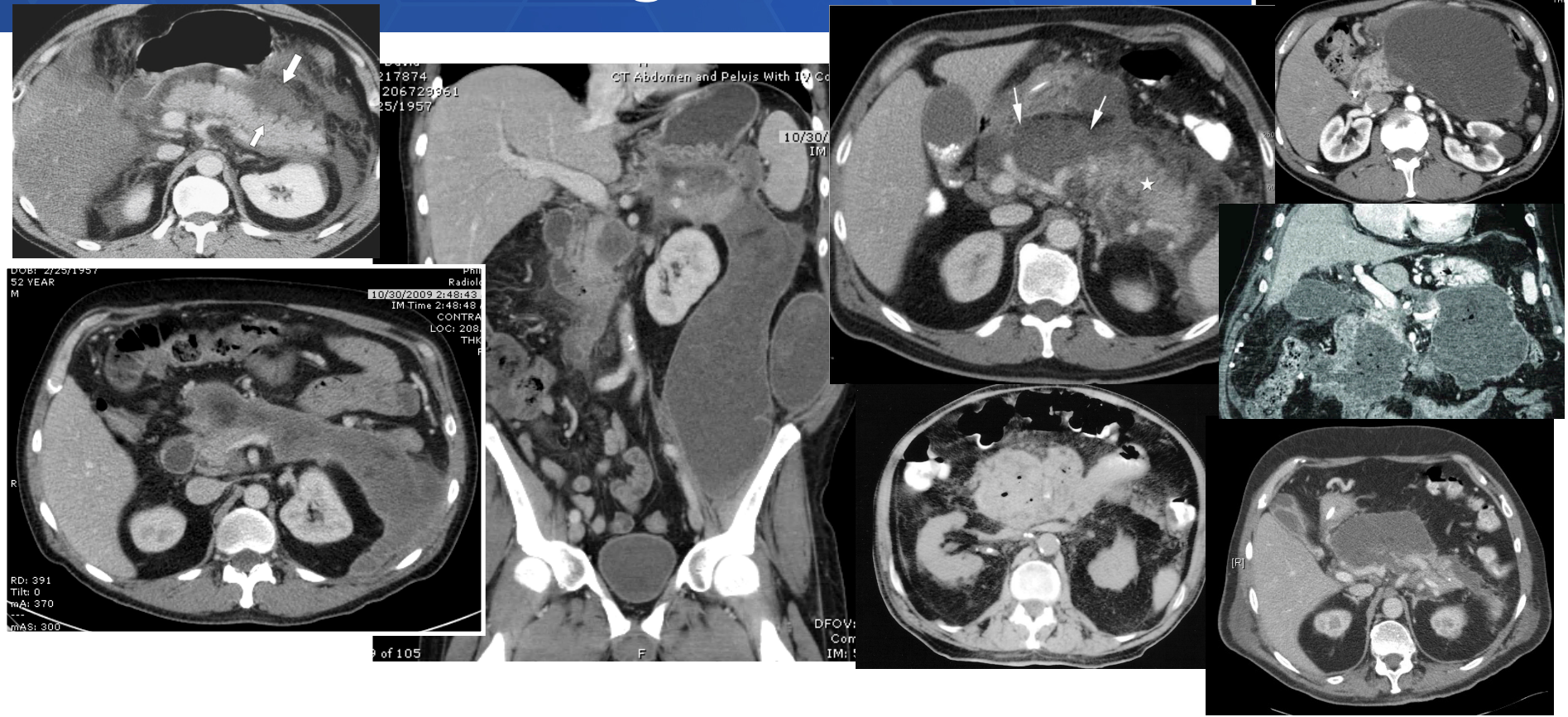
Figure: **Trial profile**
ASA=American Society of Anesthesiologists. CRP=C-reactive protein.

Lancet. 2015 Sep 26;386 (10000):1261-8

	Interval cholecystectomy (n=136)	Same-admission cholecystectomy (n=128)	Risk ratio (95% CI)	p value
Primary endpoint				
Mortality or readmission for gallstone-related complications	23 (17%)	6 (5%)	0·28 (0·12–0·66)	0·002
Secondary endpoints				
Readmission for gallstone-related complications				
Recurrent pancreatitis	12 (9%)	3 (2%)	0·27 (0·08–0·92)	0·03
Cholecystitis	2 (2%)	0		0·50
Choledocholithiasis needing ERCP	2 (2%)	1 (1%)	0·53 (0·05–5·79)	1·00
Gallstone colic	7 (5%)	2 (2%)	0·30 (0·06–1·43)	0·17
Mortality	0	1 (1%)		0·48
Patients reporting colics during waiting period*	62 (51%)	3 (3%)	0·06 (0·02–0·19)	<0·0001
Difficulty of cholecystectomy (assessed on a 0–10 visual analogue scale)	6 (4–7)	6 (4–7)		0·70
Conversion to open cholecystectomy†	4 (3%)	5 (4%)	1·31 (0·36–4·77)	0·74
Operating time (min)	60 (44–78)	58 (44–70)		0·47
Total length of stay after randomisation (days)	3 (2–5)	3 (2–4)		0·94
Need for intensive care unit admission	1 (1%)	1 (1%)		1·00
Safety endpoints				
Cystic duct leakage	1 (1%)	1 (1%)		1·00
Bleeding needing reoperation or transfusion	1 (1%)	1 (1%)		1·00
Need for additional intervention				
Surgical	0	1 (1%)		0·48
Endoscopic	0	1 (1%)		0·48
Radiological	2 (2%)	0		0·50
Pneumonia	0	2 (2%)		0·23
Pulmonary embolism	1 (1%)	0		1·00

Lancet. 2015 Sep 26;386 (10000):1261-8

Necrotizing Pancreatitis is a Heterogeneous Disease

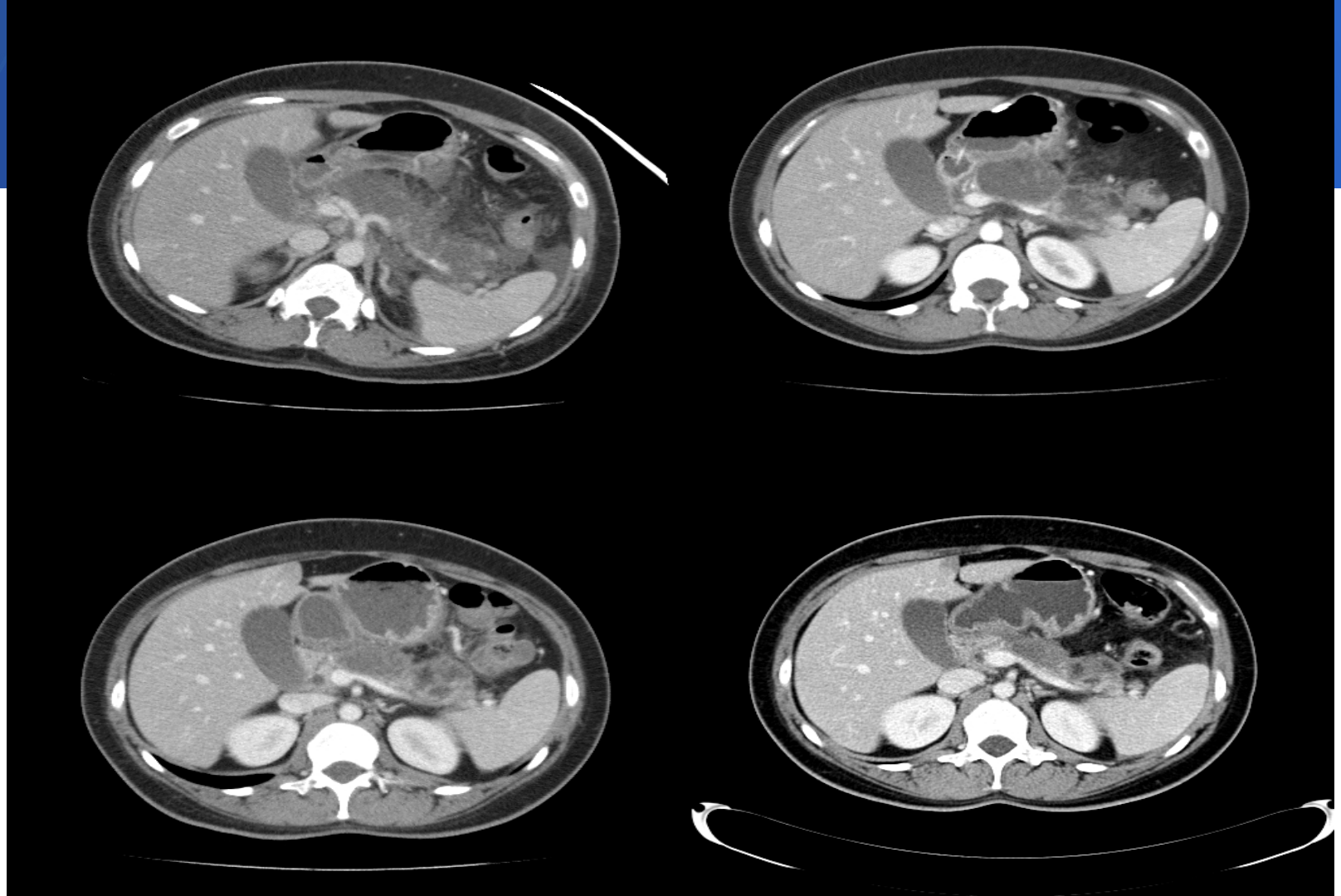


Key Concepts

- 2-phase disease
  - SIRS (weeks 1-2)
  - Infection (weeks 3-6)
- Prophylactic Antibiotics are OUT
- Parenteral nutrition is OUT
- Tube feeds are IN

Key Concepts

- Step-up approach is IN
  - No role for drains in weeks 1-2
  - Not everyone with necrosis needs a drain!
  - Drains for clinical deterioration after 2 weeks
  - 60% crossover to surgical drainage
- Persistent symptoms at 4 weeks = intervention
- Cholecystectomy regardless of presumed etiology



ORIGINAL ARTICLE

Failure to follow evidence-based best practice guidelines in the treatment of severe acute pancreatitis

Adrian C. Vlada*, Bradley Schmit*, Andrew Perry, Jose G. Trevino, Kevin E. Behrns & Steven J. Hughes

Department of Surgery, College of Medicine, University of Florida, Gainesville, FL, USA

HPB (Oxford). 2013 Oct;15(10):822-7.

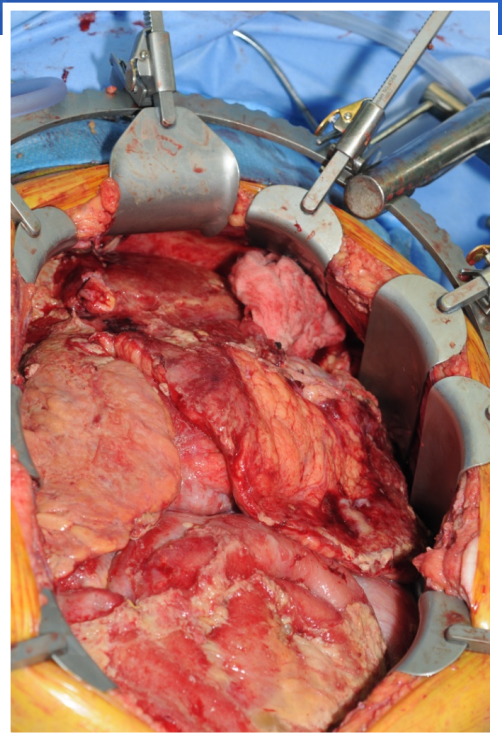
Table 4 Practice guideline adherence details

Parameter	Value
Modality of initial imaging, *n* (%)	
CT with i.v. contrast	43 (72%)
CT without i.v. contrast	11 (18%)
Abdominal ultrasound	5 (8%)
No abdominal radiological imaging	1 (1.5%)
Timing of CT imaging, *n* (%)	
At time of admission[a]	40 (66%)
After admission	15 (25%)
Time from admission, days, mean (range)	3.1 (1–7)
CT with i.v. contrast at 48–72 h, *n* (%)	15 (31%)
Antibiotic use, *n* (%)	51 (79%)
Prophylactic use[b]	26 (53%)
Carbapenem antibiotics	11 (42%)
Non-carbapenem antibiotics	15 (58%)
Nutrition	
Time without nutrition[c], days, mean (range)	2.6 (0–7)
Enteral feeding, *n* (%)	10 (17%)
TPN administration, *n* (%)	38 (60%)
Enteral or oral feeding used or considered first, *n* (%)	7 (23%)
Albumin[d], g/dl, mean (range)	2.6 (1.8–4.1)

HPB (Oxford). 2013 Oct;15(10):822-7.

Methods of Debridement

- Open debridement
- Percutaneous drainage
- VARD – “step up”
- Trans-gastric necrosectomy
- Combination



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Surgical Transgastric Debridement
"One Stop Shopping"

- Thorough Debridement (single procedure)
- Durable internal drainage
  - Avoid "Disconnected Duct Syndrome"
  - No external drains
- Cholecystectomy + IOC
- +/- enteral feeding access

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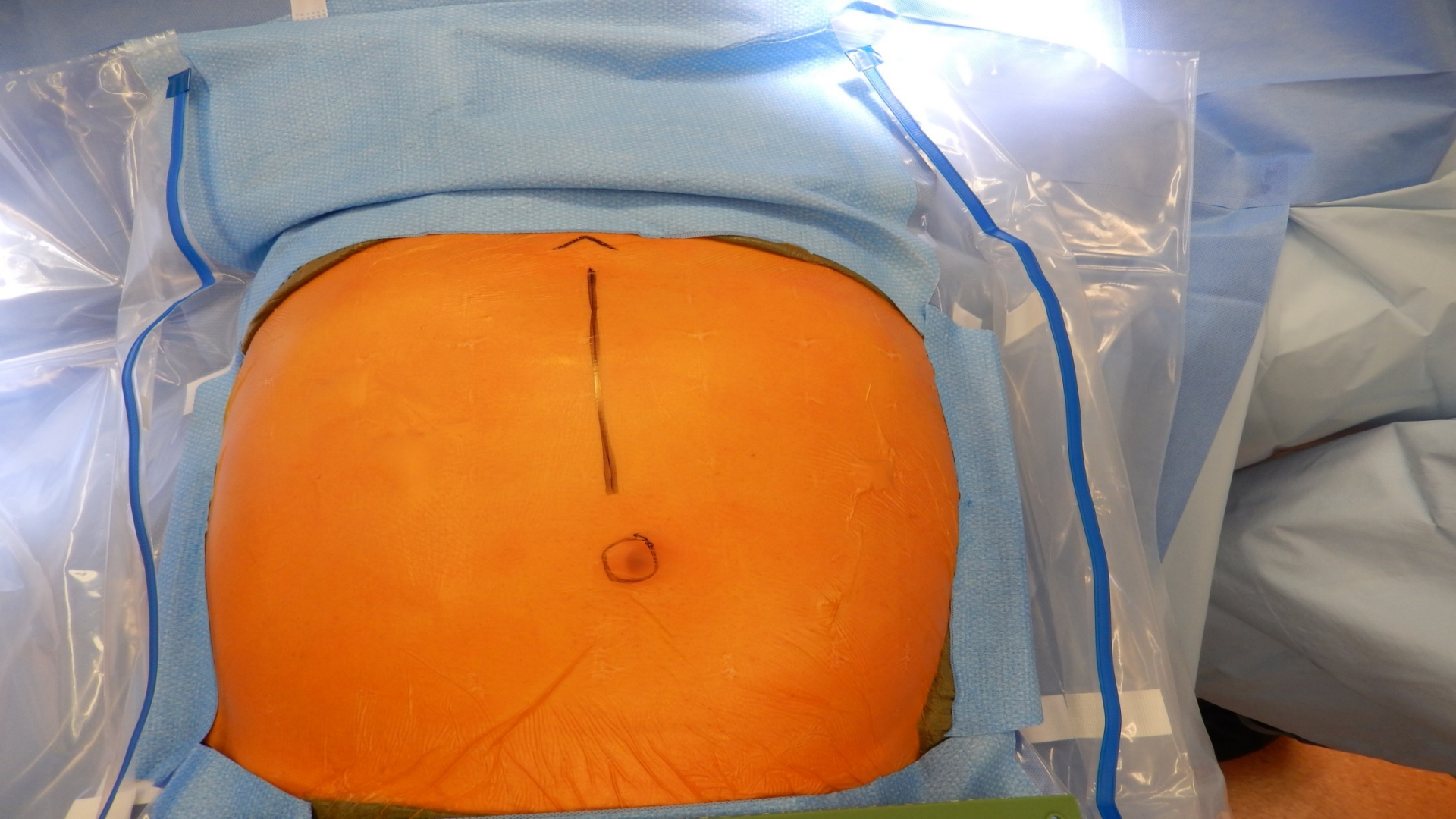
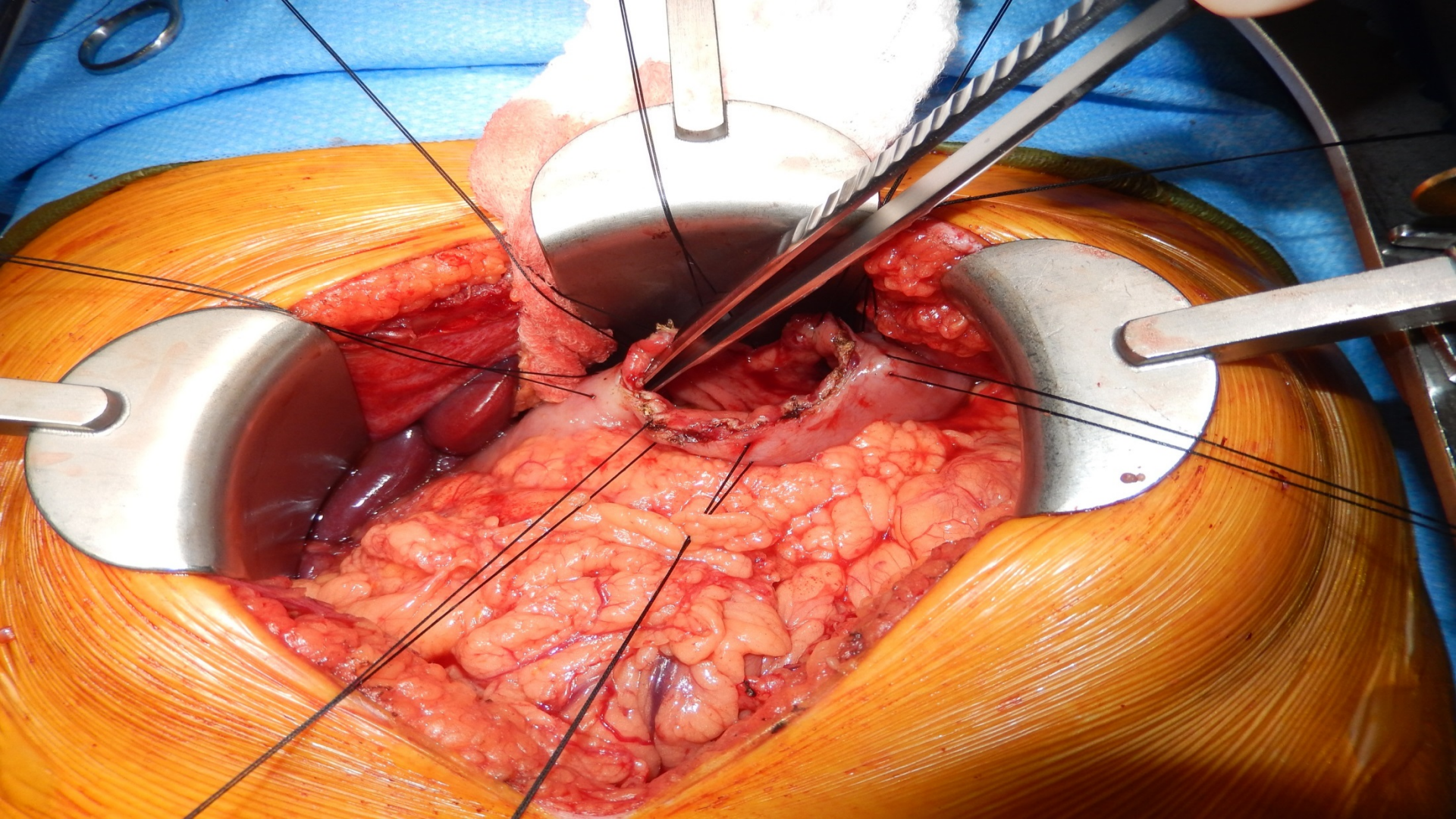
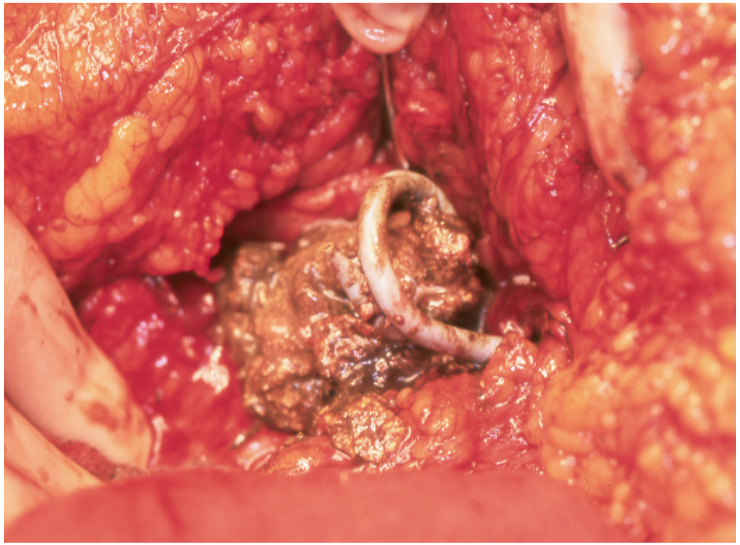




Percutaneous Drains



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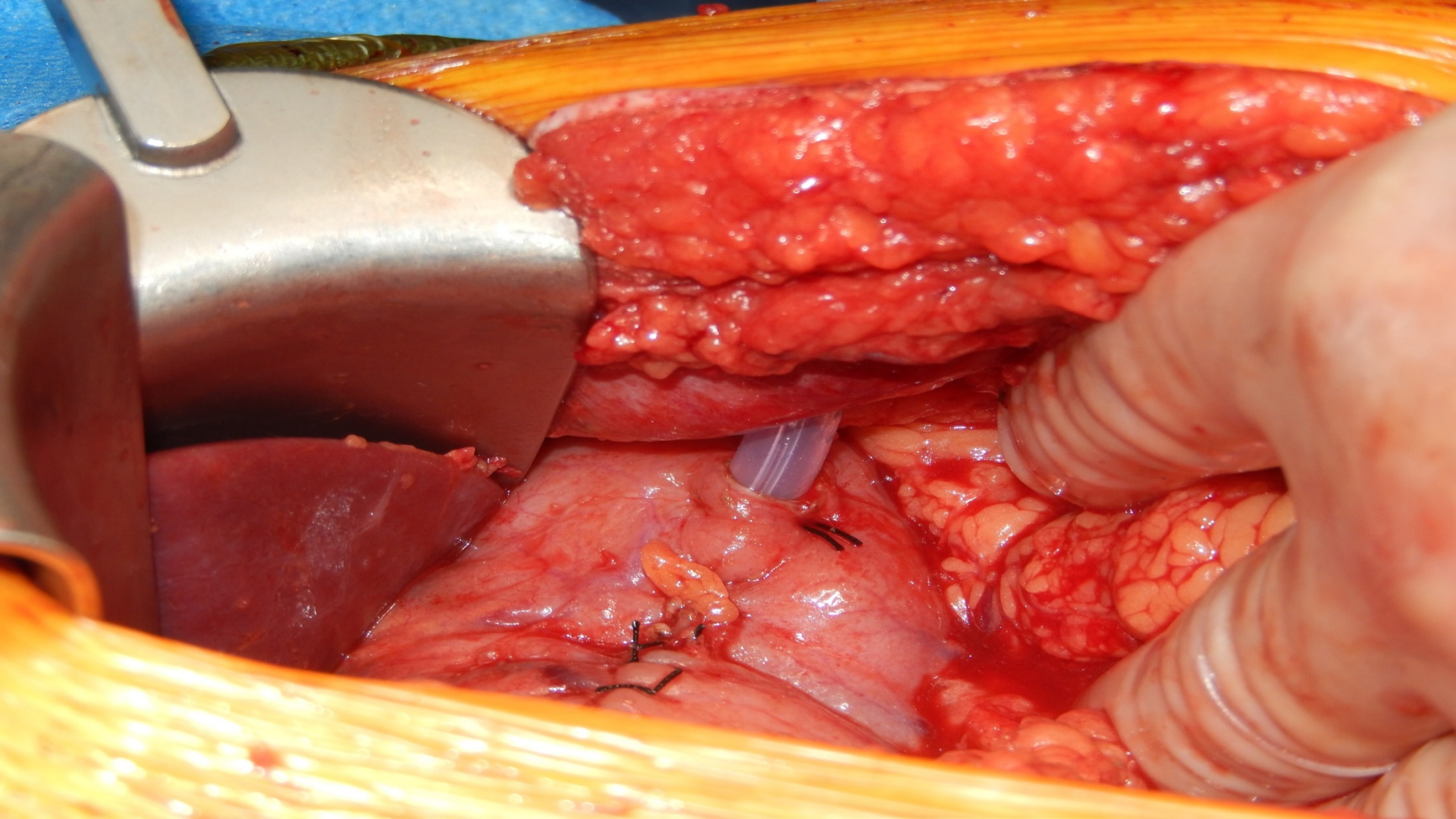

Surgical Transgastric Necrosectomy for Necrotizing Pancreatitis: A Single-stage Procedure for Walled-off Pancreatic Necrosis

Driedger, Michael, MD*; Zyromski, Nicholas J., MD†; Visser, Brendan C., MD‡; Jester, Andrea, MD†; Sutherland, Francis R., MD*; Nakeeb, Atilla, MD†; Dixon, Elijah, MD*; Dua, Monica M., MD‡; House, Michael G., MD†; Worhunsky, David J., MD‡; Munene, Gitonga, MD*; Ball, Chad G., MD, MSc*

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doi: 10.1097/SLA.0000000000003048

J Gastrointest Surg (2015) 19:1441–1448
DOI 10.1007/s11605-015-2864-6

ORIGINAL ARTICLE

Cyst Gastrostomy and Necrosectomy for the Management of Sterile Walled-Off Pancreatic Necrosis: a Comparison of Minimally Invasive Surgical and Endoscopic Outcomes at a High-Volume Pancreatic Center

Mohammad Khreiss[1] · Mazen Zenati[1] · Amber Clifford[1] · Kenneth K. Lee[1] · Melissa E. Hogg[1] · Adam Slivka[2] · Jennifer Chennat[2] · Andres Gelrud[3] · Herbert J. Zeh[1] · Georgios I. Papachristou[2] · Amer H. Zureikat[1,4]

Characteristic	Surgical $n=20$	Endotherapy $n=20$	p value
Time from AP to treatment, weeks, median (IQR)	9 (6–12)	8 (6–14)	0.470
Number of patients requiring post procedure re-intervention for residual WON	3 (15)[a]	9 (45)[b]	0.082
Number of Post-procedure Intervention/patient median (range)	0 (0–1)	1 (0–10)	0.008
Index procedure LOS, days median (IQR)	7 (5–7)	2 (1–6)	0.003
Total LOS (index+re-interventions), median(IQR)	7 (6–10)	3 (1.5–11)	0.032
Failure	3 (15)[c]	2(10)[d]	0.661
Time to resolution, months, mean (± SD)	0.42±1.0	3.6±3.3	0.001
Total follow-up months, median(IQR)	6 (3–10)	16 (7–24)	0.027
Mortality	0	0	
Complications	4 (20)	4 (20)	1
Infection	2 (10)	2 (10)	
Bleeding	1 (5)	1 (5)	
Perforation	0	1 (5)	
Other	1 (5)	0	
Cost analysis, USD mean±SD			
Total cost of primary admission	18,712±6758	15,367±15,685	0.014
Cost of primary admission per day	5408±6851	6917±6293	0.017
Total cost of all related readmissions	17,977±20,191	32,087±43,272	0.855
Cost of readmission per day	2996±1229	3312±2178	0.855
Overall cost (primary+all readmissions)	23,206±15,676	24,993±31,494	0.168

Long-Term Outcomes

- Population data unknown
- 62% surviving patients one or more late complication
  - Biliary stricture 4%
  - Pseudocyst 8%
  - Pancreatic fistula 13%
  - Hernia 1%
  - 25% exocrine and 33% endocrine insufficiency

Connor S, *et al.* **Surgery** 2005 137(5):499-505

Disconnected Pancreatic Duct

Disconnected Pancreatic Duct Syndrome: Disease Classification and Management Strategies

Trevan D Fischer, MD, Daniel S Gutman, BS, Steven J Hughes, MD, FACS, Jose G Trevino, MD, FACS, Kevin E Behrns, MD, FACS

J Am Coll Surg. 2014 Oct;219(4):704-

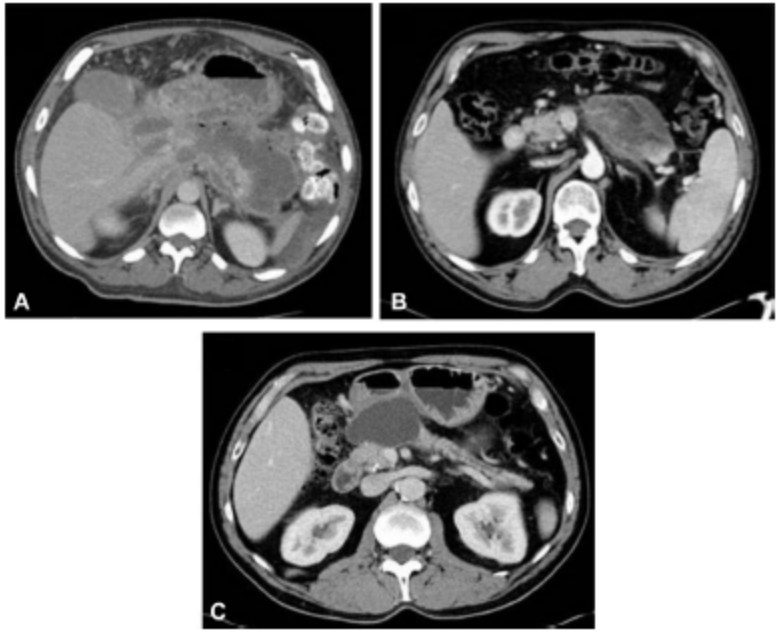


Figure 1. CT images of typical presentations for (A) concurrent, (B) delayed, and (C) chronic pancreatitis-associated disconnected pancreatic duct syndrome.

DPDS Presentation is Delayed!

Table 5. Operative Treatment

Variable	Concurrent DPDS (n = 28)	Delayed DPDS (n = 15)	CP DPDS (n = 7)	p Value
Operation performed, *n* (%)				
Pancreatic necrosectomy	28 (100)	0 (0)	0 (0)	<0.001
Distal pancreatectomy	0 (0)	15 (100)	0 (0)	<0.001
Roux-en-Y PJ	0 (0)	0 (0)	7 (100)	<0.001
Diagnosis to operation, *d*				
Mean ± SD	284 ± 896	981 ± 1949	406 ± 464	<0.001
Median (range)	66 (26–4,795)	440 (89–5,235)	417 (25–1,362)	
Total length of stay, *d*, mean ± SD	37 ± 26.7	11.73 ± 6.8	12 ± 7.6	<0.001
Length of stay after operation, *d*, mean ± SD	19 ± 24.6	8.7 ± 3.8	7.7 ± 2.8	<0.001
Length of stay before operation, *d*, mean ± SD	17.8 ± 12.8	3 ± 3.9	4.3 ± 3.1	<0.001
Intraoperative transfusion, *n* (%)	19 (68)	9 (60)	0 (0)	0.005
EBL, mL, mean ± SD	891 ± 859	1123 ± 804	385 ± 195	0.060
Postoperative transfusion, *n* (%)	16 (57)	4 (27)	1 (14)	0.043
Splenic artery embolization, *n* (%)	3 (11)	12 (80)	0 (0)	<0.001

PJ, pancreanjejunostomy.

J Am Coll Surg. 2014 Oct;219(4):704-12.

Chronic Pancreatitis: Is Surgical Therapy Appropriate?

- Randomized trial of endoscopic transampullary stent (N=19) vs operative pancreatojejunostomy (N=20)
- Primary endpoint- pain score @ 2 years
- Results
  - Primary endpoint- surgery patients had lower pain score (25 vs 51; p<0.001)
  - Secondary endpoints favor surgery with:
    - Better physical QOL
    - Fewer total procedures
    - Better pain relief conclusion of study
  - No difference in LOS, complications, pancreatic function
- Conclusion- surgery is better treatment in patients with obstructed pancreatic duct
- Supported by subsequent Cochrane Database Systematic Review 2012; DOI: 10.1002/14651858.CD007884.pub2.
  - Three (3) studies included

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Endoscopic versus Surgical Drainage of the Pancreatic Duct in Chronic Pancreatitis

Djuna L. Cahen, M.D., Dirk J. Gouma, M.D., Ph.D., Yung Nio, M.D., Erik A. J. Rauws, M.D., Ph.D., Marja A. Boermeester, M.D., Ph.D., Olivier R. Busch, M.D., Ph.D., Jaap Stoker, M.D., Ph.D., Johan S. Laméris, M.D., Ph.D., Marcel G.W. Dijkgraaf, Ph.D., Kees Huibregtse, M.D., Ph.D., and Marco J. Bruno, M.D., Ph.D.

ABSTRACT

BACKGROUND

For patients with chronic pancreatitis and a dilated pancreatic duct, ductal decompression is recommended. We conducted a randomized trial to compare endoscopic and surgical drainage of the pancreatic duct.

METHODS

All symptomatic patients with chronic pancreatitis and a distal obstruction of the pancreatic duct but without an inflammatory mass were eligible for the study. We randomly assigned patients to undergo endoscopic transampullary drainage of the pancreatic duct or operative pancreaticojejunostomy. The primary end point was the average Izbicki pain score during 2 years of follow-up. The secondary end points were pain relief at the end of follow-up, physical and mental health, morbidity, mortality, length of hospital stay, number of procedures undergone, and changes in pancreatic function.

RESULTS

Thirty-nine patients underwent randomization: 19 to endoscopic treatment (16 of whom underwent lithotripsy) and 20 to operative pancreaticojejunostomy. During the 24 months of follow-up, patients who underwent surgery, as compared with those who were treated endoscopically, had lower Izbicki pain scores (25 vs. 51, P<0.001) and better physical health summary scores on the Medical Outcomes Study 36-Item Short-Form General Health Survey questionnaire (P=0.003). At the end of follow-up, complete or partial pain relief was achieved in 32% of patients assigned to endoscopic drainage as compared with 75% of patients assigned to surgical drainage (P=0.007). Rates of complications, length of hospital stay, and changes in pancreatic function were similar in the two treatment groups, but patients receiving endoscopic treatment required more procedures than did patients in the surgery group (a median of eight vs. three, P<0.001).

CONCLUSIONS

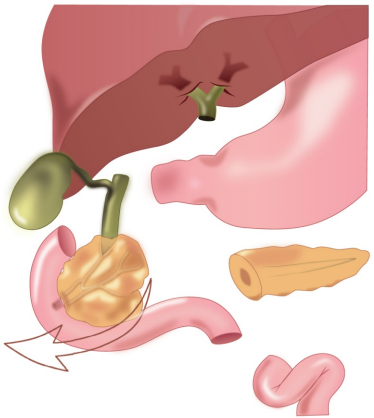
Surgical drainage of the pancreatic duct was more effective than endoscopic treatment in patients with obstruction of the pancreatic duct due to chronic pancreatitis. (Current Controlled Trials number, ISRCTN04572410.)

From the Departments of Gastroenterology and Hepatology (D.L.C., E.A.J.R., K.H., M.J.B.), Surgery (D.J.G., M.A.B., O.R.B.), Radiology (Y.N., J.S., J.S.L.), and Clinical Epidemiology, Biostatistics, and Bioinformatics (M.G.W.D.), Academic Medical Center, Amsterdam. Address reprint requests to Dr. Cahen at the Department of Gastroenterology and Hepatology, Academic Medical Center, Meibergdreef 9, 1105 AZ Amsterdam, the Netherlands, or at djca@zha.nl.

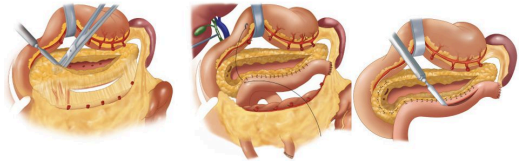
N Engl J Med 2007;356:676-84.

What Are the Options for Surgical Treatment of CP?

Resection



Drainage



TPIAT

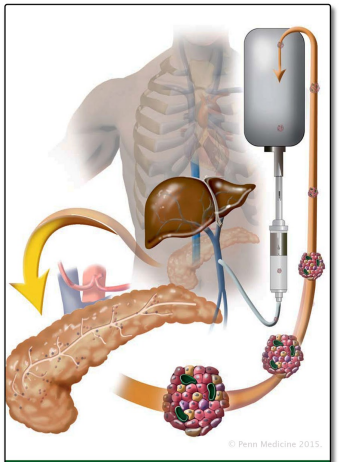


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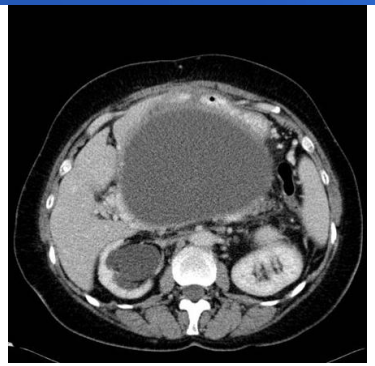
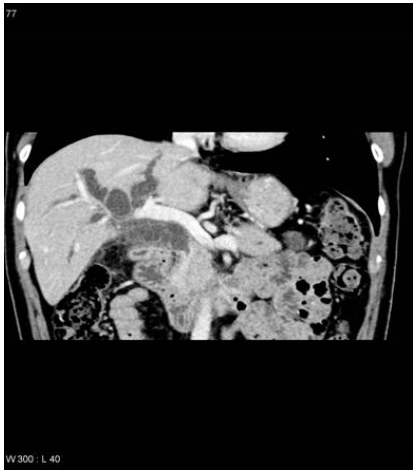
Figure 1. Total pancreatectomy with islet auto-transplantation (TPIAT) involves separation and purification of islet cells from the diseased pancreas for transplantation via portal vein infusion into the patient's liver.

Mitigating Factors Influencing Procedure Choice

- Presence of a pseudocyst
- Prominent pancreatic head
- Biliary stricture
- Small duct disease
- Possibility of malignant mass
- Pancreatic duct stones
- Duodenal stenosis
- Vascular compromise/portal HTN
- Poor patient compliance
- Alcohol recidivism
- Relatively preserved endocrine function
- Poor endocrine function but little pain
- Overall performance status
- Patient support system





Outcomes of Surgical Therapy

	RESECT	DRAINAGE	TPIAT
Narcotic free (%)	>80	>80	>70
QOL (Physical Function)	75	73	74
Mortality(%)	3	7	1.2
Morbidity (%)	30-50	30-50	64
Reoperation (%)	2	5	16
Readmission (%)	11	27	>40
Length of Stay (days)	16	18	14
New Onset DM (%)	5	4	30% Insulin Independent @ 3 years
New Onset Exocrine Insufficiency (%)	49	40	NA

Summary

- Cholecystectomy may be indicated for all patients with acute pancreatitis – is U/S even necessary?
- Cholecystectomy should be performed during the index hospitalization
- Delayed intervention in WOPN is better
- Recognize the disconnected pancreatic duct!
- Surgery works for chronic pancreatitis

Contact Information

steven.hughes@surgery.ufl.edu

Cell: 412-559-7334