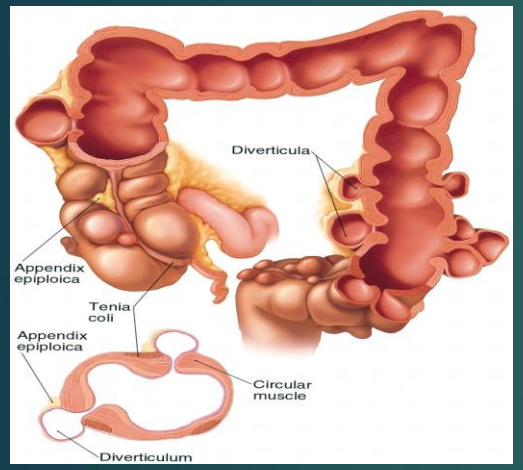
KSCRS
Kuwait Society of Colorectal Surgeons

Egyptian Society of Colon & Rectal Surgeons. ESCRS

Diverticulitis & individualized management
Comment on elective resection



Abdullah A Alhaddad MD

FACS , FRCSC , FASCRS

Consultant general & colorectal surgeon

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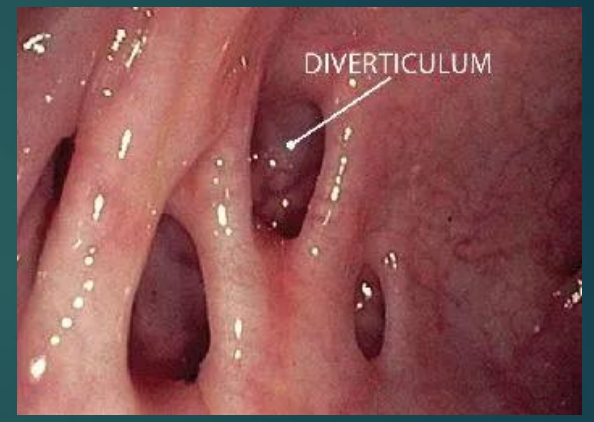
Chairperson at Dar Alshifa Hospital

President of Kuwait society of colorectal surgeons (KSCRS)

V Assistant professor ,University of Miami ,Miller School of medicine



Diverticulitis & individualized management

- Nothing to disclose

Diverticulitis & individualized management

- Definitions
- Classification
  - Non-Complicated
  - Complicated
- individualized Management and timing of surgery

Diverticulitis & individualized management

- ***Diverticular disease*** of the colon is one of the most commonly diagnosed gastrointestinal conditions
- ***Complicated disease*** includes diverticulitis associated with free perforation, fistula, abscess, stricture, or obstruction
- **Uncomplicated diverticulitis** is defined as diverticulitis which is not associated with any of the aforementioned features
- Microperforation with small amounts of contained extraluminal gas, in the absence of a systemic inflammatory response, is considered uncomplicated diverticulitis
- Symptomatic uncomplicated diverticular disease ***(SUDD***) is defined as diverticulosis associated with chronic abdominal pain

Gastroenterology. 2019;156(1):254-272.e11.

Diverticulitis & individualized management

SYMPTOMATIC UNCOMPLICATED

SUDD is defined as presence of diverticula and symptoms of abdominal pain and bloating with bowel habit changes in the absence of macroscopic inflammation

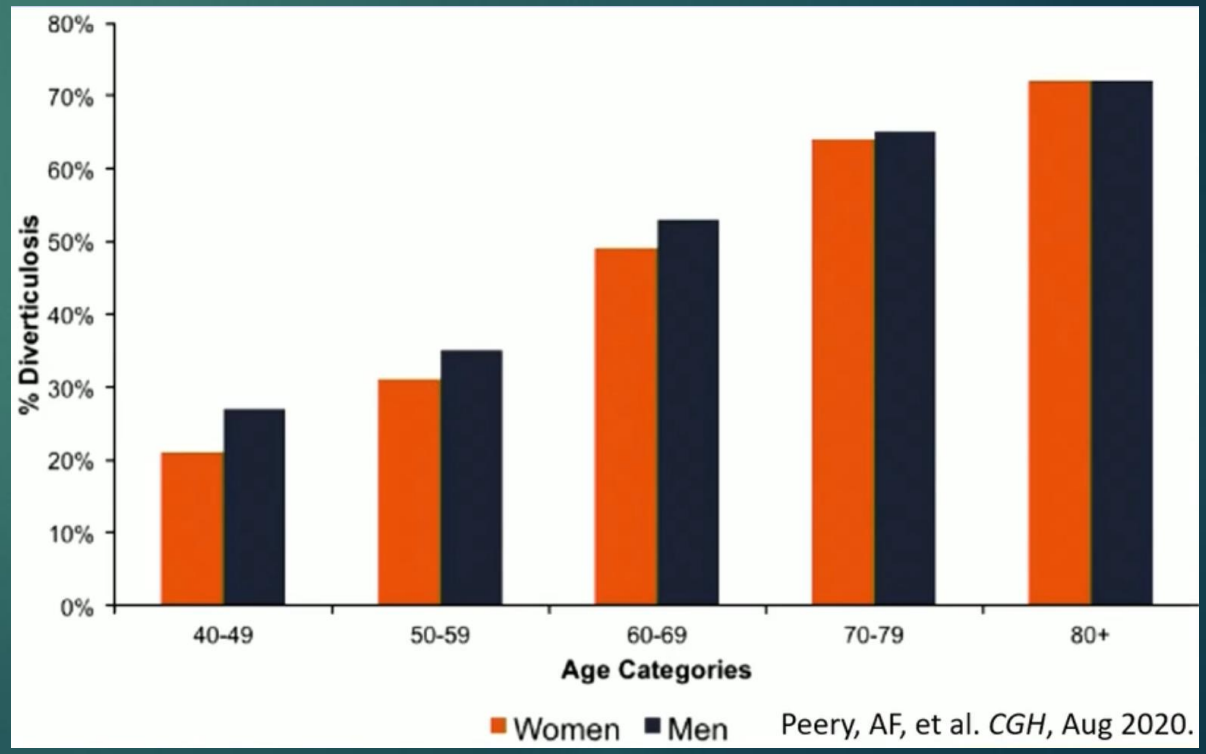
Domains	Items	Response Options
Physical symptoms	Bloated	"how many days…"
	Watery stools	*No days, 1 day only, 2-5 days, 6-9 days, 10-13 days, every day*
	Incomplete evacuation	
	Nausea	
	Abdominal pain	
Concerns	Unexpected flare up	"how concerned were you that…"
	Seriously wrong with body	*Not at all concerned, a little bit concerned, moderately concerned, quite a bit concerned, extremely concerned*
	Damage within body	
Emotions	Others look down on me	*None of the time, rarely, sometimes, a lot of the time, all of the time*
	Frustrated	
	Anxious	
	Irritated	
Behavioral changes	Ate less	*None of the time, rarely, sometimes, a lot of the time, all of the time*
	Wear looser clothing	
	Avoid social engagements	
	Could not sleep	
	Miss work or other obligations	

A score of 3.2 out of 10 distinguished between those with HRQoL-impacting diverticulosis

Spiegel BM .Qual life res .2015;24:163

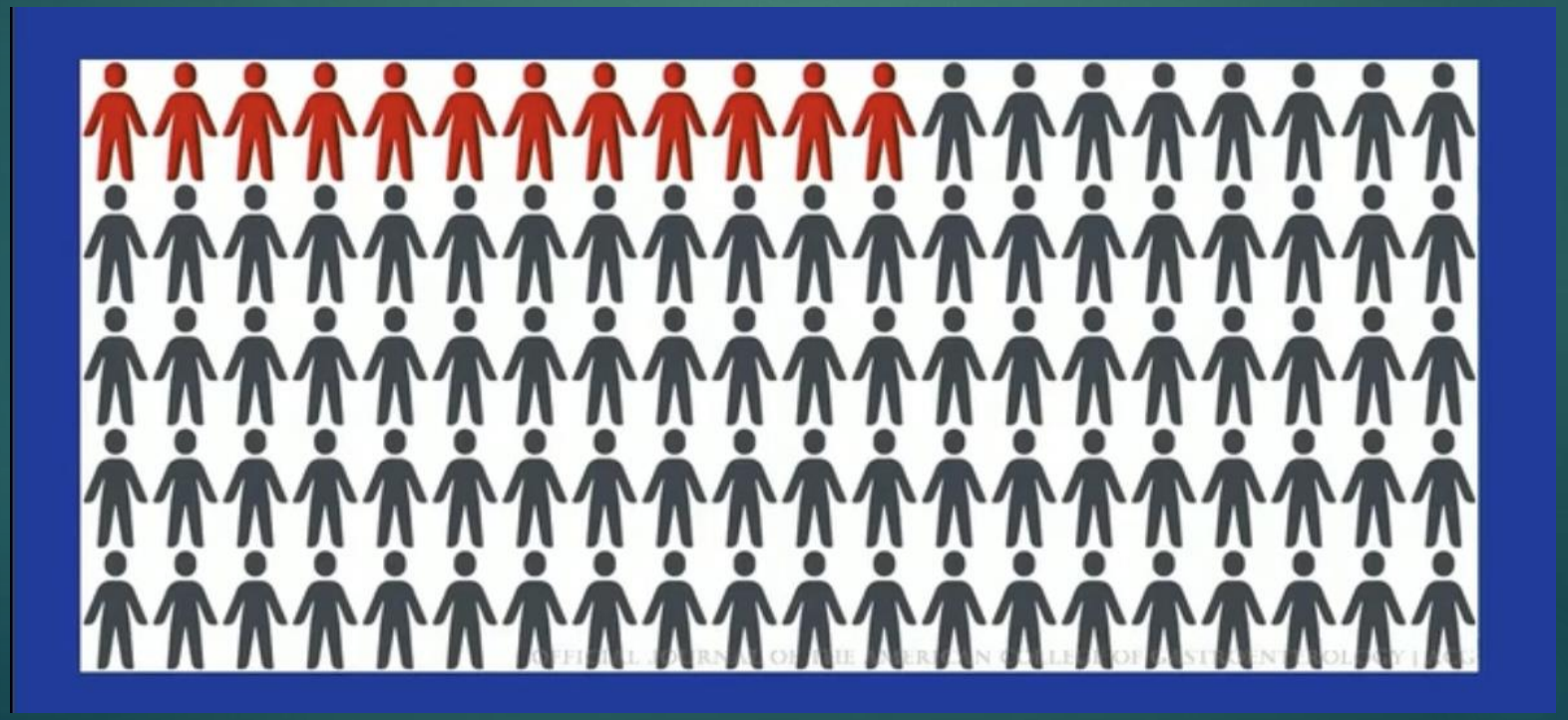
Diverticulitis & individualized management

- The magnitude of the problem
  - Age related increase in incidence of diverticulosis
  - 5 % develop diverticulitis over 7 years



Diverticulitis & individualized management

- 12 % of patients with acute diverticulitis develop complication
  - 80% of the complications (abscess , fistula , perforation or obstruction) occur in the first episode



Strate L , and Peery , A
Am J gastro , Apr 2023

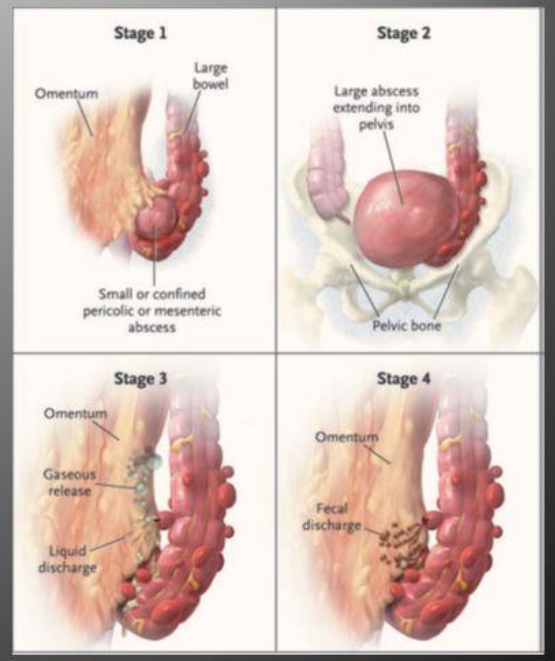
Diverticulitis & individualized management

- Classification
  - Hinchey classification

Hinchey Classification	
1a	Pericolonic phlegmon and inflammation, no fluid collection
1b	Pericolonic abscess <4cm
2	Pelvic or inter-loop abscess OR abscess >4cm
3	Purulent peritonitis
4	Feculent peritonitis

Hinchey classification

- Stage 1
- Pericolic or mesenteric abscesses.
- Stage 2
- Walled off pelvic abscess.
- Stage 3
- Generalised purulent peritonitis.
- Stage 4
- Generalised fecal peritonitis



Diverticulitis & individualized management

Modified Hinchey Classification of Acute Diverticulitis [modified from (9) and (26)]

Stage	Characteristics
0	Mild clinical diverticulitis (left lower quadrant abdominal pain, low-grade fever, leukocytosis, no imaging information)
1a	Confined pericolic inflammation, no abscess
1b	Confined pericolic abscess (abscess or phlegmon may be palpable; fever; severe, localized abdominal pain)
2a	Distant abscess amenable to percutaneous drainage
2b	Complex abscess associated with/without fistula
3	Generalized purulent peritonitis, no communication with bowel lumen
4	Feculent peritonitis, open communication with bowel lumen
Complications	Fistula, obstruction (large bowel or small bowel)

JSLS (2008)12:188 –193

Diverticulitis & individualized management

- Pathophysiology and risk factors
  - Genetics 40% - 50%
  - diet Fiber intake

Risk factor	Category	RR/OR[a]	References
Diet			
Fiber	Highest quintile	0.57–0.75	48,49
Nuts	>2 times/wk	0.80	50
Popcorn	>2 times/wk	0.72	50
Vegetarian diet	Yes/no	0.69	49
Prudent dietary pattern[b]	Highest quintile	0.74	39
Western dietary pattern[c]	Highest quintile	1.55	39
Red meat	Highest quintile	1.58	38
Lifestyle			
Physical activity	Highest quintile	0.63–0.75	40,51,52
BMI	BMI ≥30 kg/m^2	1.33–4.4	40–42
Waist-to-hip ratio	Highest quintile	1.62	42
Smoking	Current or ≥15 cigarettes/d	1.23–1.89	41,45,46
Medications			
Non-aspirin NSAIDs	≥2 times/wk	1.72	58
Aspirin	Ever or ≥2 times/wk	1.25–1.32	57,58
All NSAIDs	≥2 times/wk	1.62	58
Corticosteroids	Current use	2.74	57
Opiate analgesics	Current use	2.16	57
Statins	Current use	0.44	57
Vitamin D	Highest quintile	0.49	61
Sibling with diverticular disease	Yes/no	2.92	96

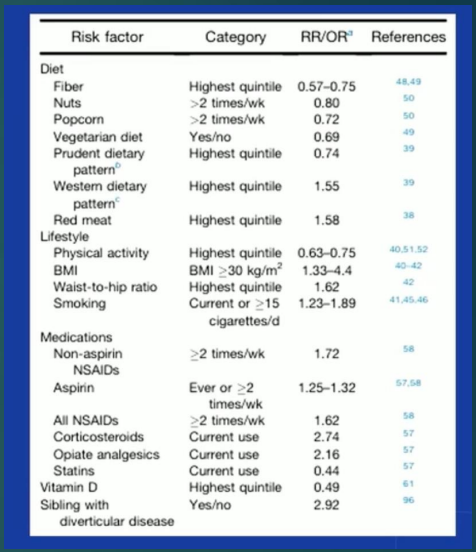
Dis Colon Rectum. 2018;61(3):382-389.
Int J Color Dis. 2017;32:611–22.
peery ,AF et al Aug 2020

Diverticulitis & individualized management

- Risk factors
  - Age
    - Younger patients do not appear to have more virulent disease than their older counterparts. The younger patients have a higher lifetime risk of developing recurrent disease owing to the greater number of remaining years at risk.
    - The relative risk of having an emergent operation in the younger cohort was slightly higher in a systematic review (7.3% vs. 4.9%)

Scand J Gastroenterol. 2013;48(6):643-51

  - Sex
  - Physical activity
  - Smoking
  - NSAID
  - Obesity



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Int J Color Dis. 2017;32:611–22.

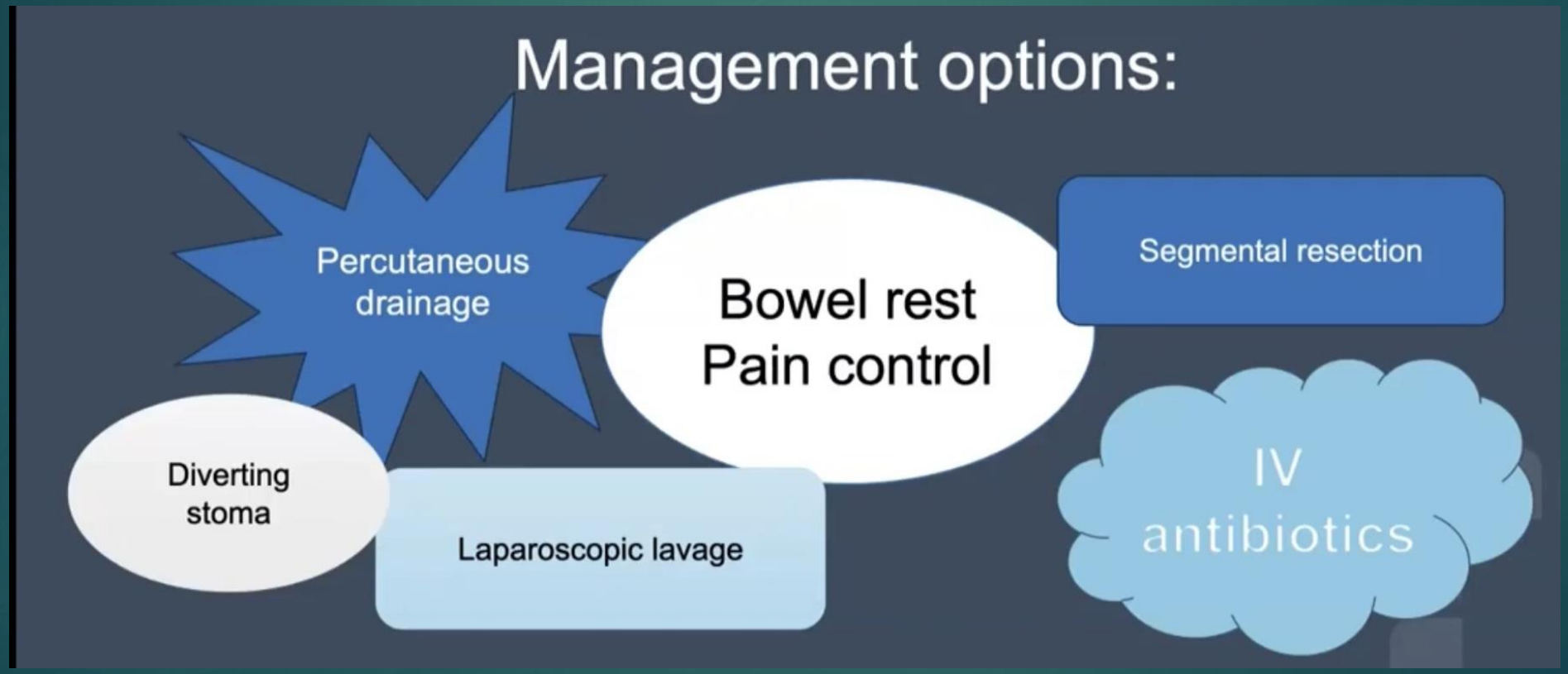
Diverticulitis & individualized management

- Investigation
  - CRP
  - CT scan gold standard
  - Endoscopy
    - Flexible sigmoidoscopy vs colonoscopy , not in the acute setting

Diverticulitis & individualized management

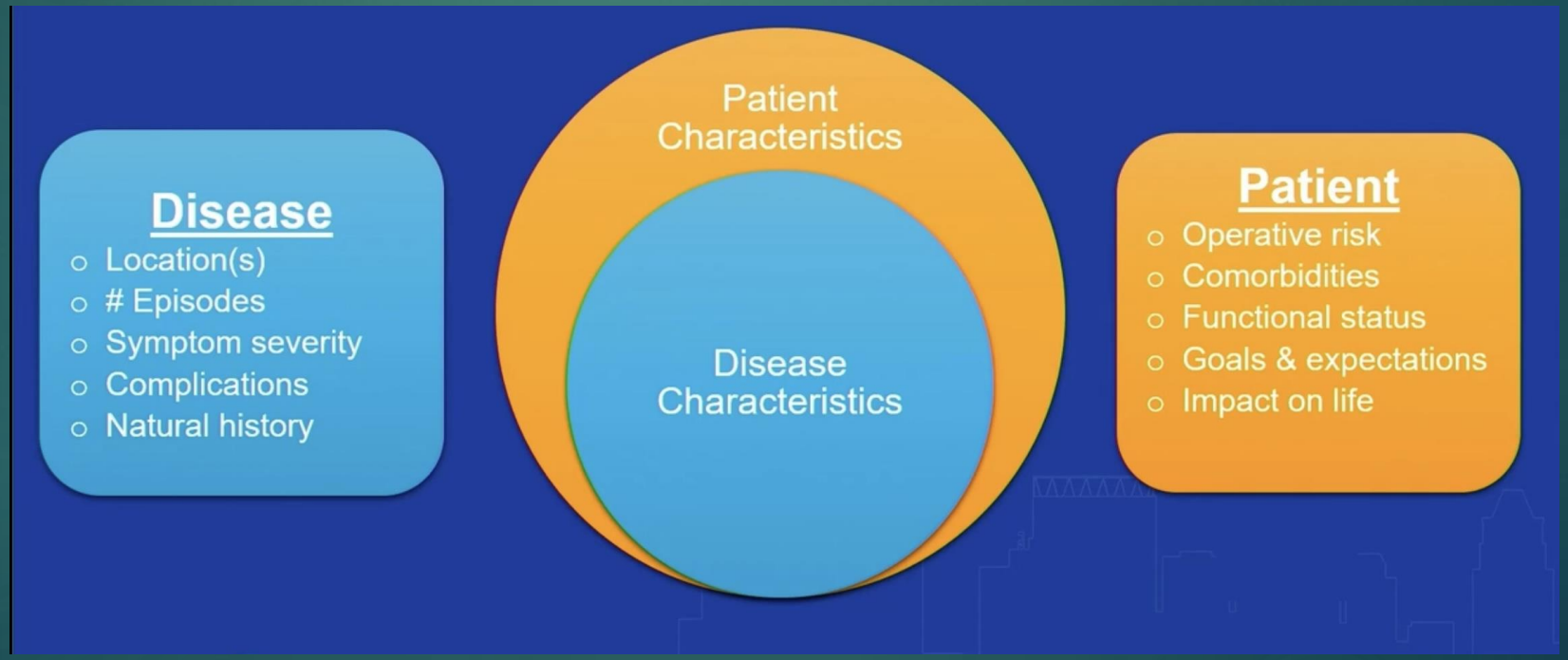
Individualized Management and timing of surgery

Diverticulitis & individualized management



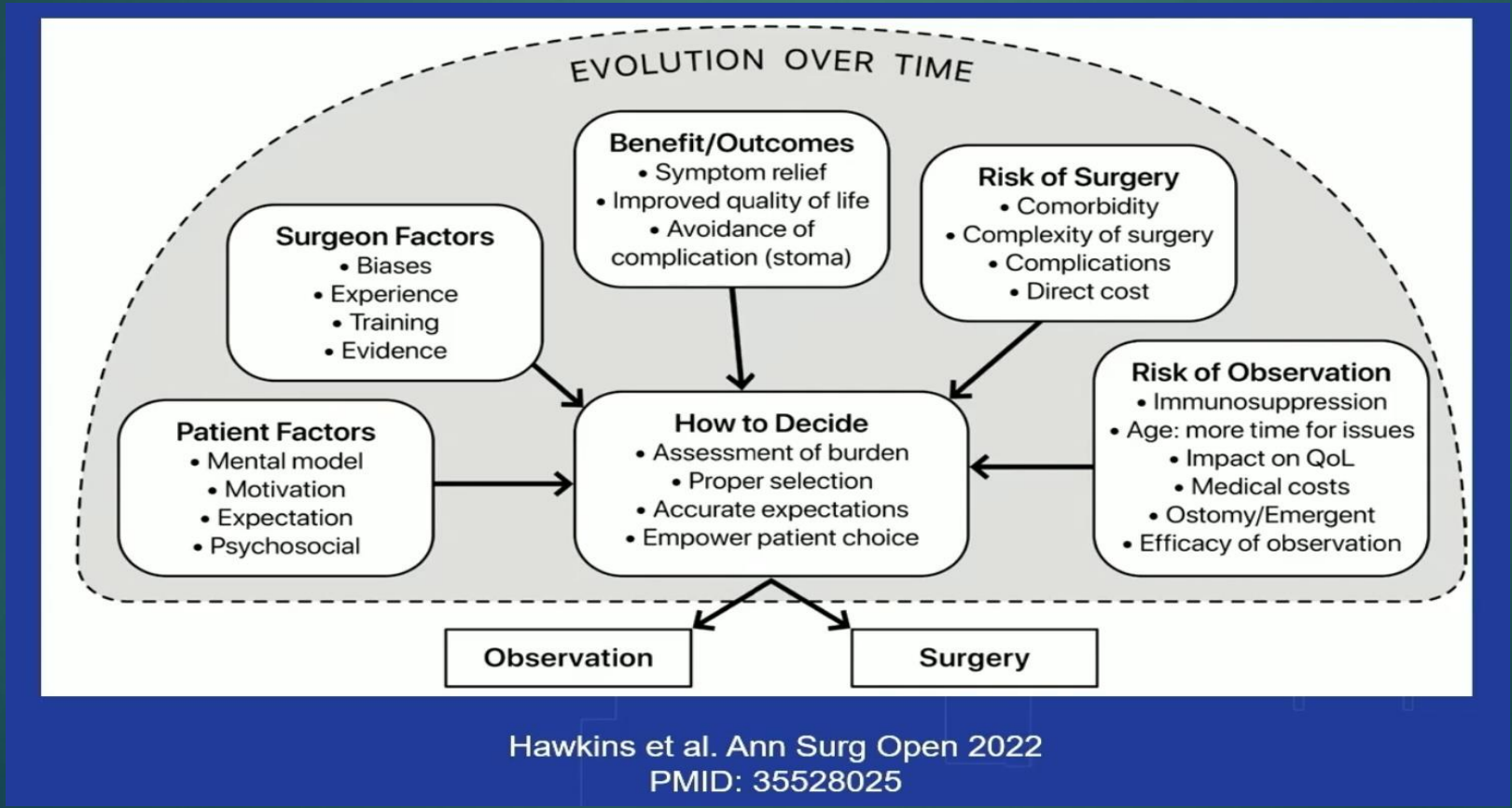
Diverticulitis & individualized management

- How to consider , individualize , advise , recommend



Diverticulitis & individualized management

- How to consider , individualize , advise , recommend



Hawkins et al. Ann Surg Open 2022
PMID: 35528025

Diverticulitis & individualized management

- How to consider , individualize , advise , recommend

Diverticulitis & individualized management

- Asymptomatic colonic diverticulosis
  - LOW RISK FOR FUTURE ACTIVE DISEASE
  - CONSIDER:
    - Physical activity
    - Reduce weight
    - Stop smoking
    - Reduced red meat

ASCRS practice guidelines .DCR 2020;63:728

Strate LL et al .gastroenterology .2019;156:1298

Diverticulitis & individualized management

- Medical management
  - Antibiotics vs no antibiotics

Diverticulitis & individualized management

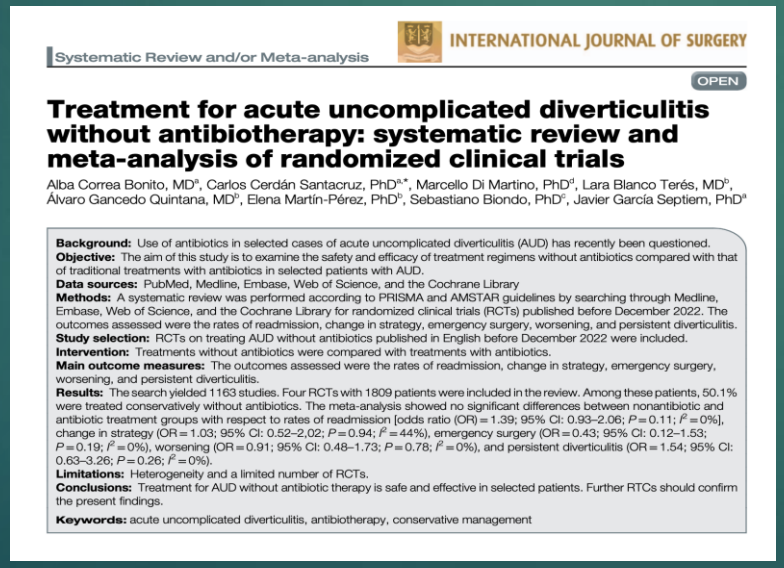
- Acute Uncomplicated Diverticulitis
  - DIABOLO and AVOD trials
    - In both trials, there were no differences with respect to development of complicated diverticulitis in the short or long term, nor in rates of recurrent diverticulitis based on antibiotic usage
- The 2020 ASCRS guidelines for the treatment of left-sided diverticulitis recommend that “selected patients with uncomplicated diverticulitis can be treated without antibiotics,

Br J Surg. 2012;99(4):532-9. Am J Gastroenterol. 2018;113(7):1045-1052.

ASCRS Guidelines

Diverticulitis & individualized management

- Uncomplicated Acute diverticulitis (UAD)
  - Data support Omission of Antibiotics
  - No difference readmission , changing in treatment strategy , emergency surgery , worsening or persistent diverticulitis



Systematic Review and/or Meta-analysis

INTERNATIONAL JOURNAL OF SURGERY

OPEN

Treatment for acute uncomplicated diverticulitis without antibiotherapy: systematic review and meta-analysis of randomized clinical trials

Alba Correa Bonito, MD[a], Carlos Cerdán Santacruz, PhD[a,*], Marcello Di Martino, PhD[d], Lara Blanco Terés, MD[b], Álvaro Gancedo Quintana, MD[b], Elena Martín-Pérez, PhD[b], Sebastiano Biondo, PhD[c], Javier García Septiem, PhD[a]

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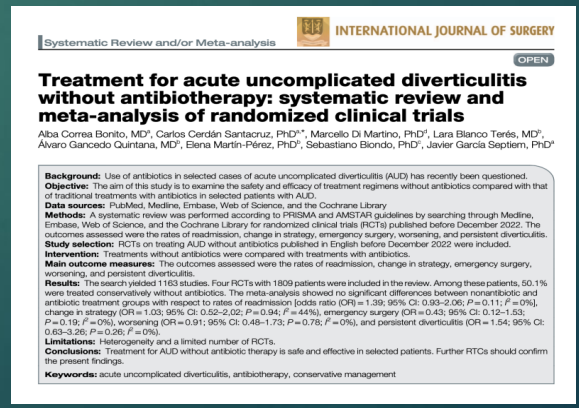
Limitations: Heterogeneity and a limited number of RCTs.
Conclusions: Treatment for AUD without antibiotic therapy is safe and effective in selected patients. Further RTCs should confirm the present findings.

Keywords: acute uncomplicated diverticulitis, antibiotherapy, conservative management

Int J Surg. 2023 Apr 10;109(5):1412–1419.

Diverticulitis & individualized management

- Meta analysis
- 4 RCT , 1809 Patients
- Population – patient with acute uncomplicated diverticulitis
- Intervention antibiotic vs no antibiotics
- Outcome – emergency surgery , time to recovery , LOS , hospital admission



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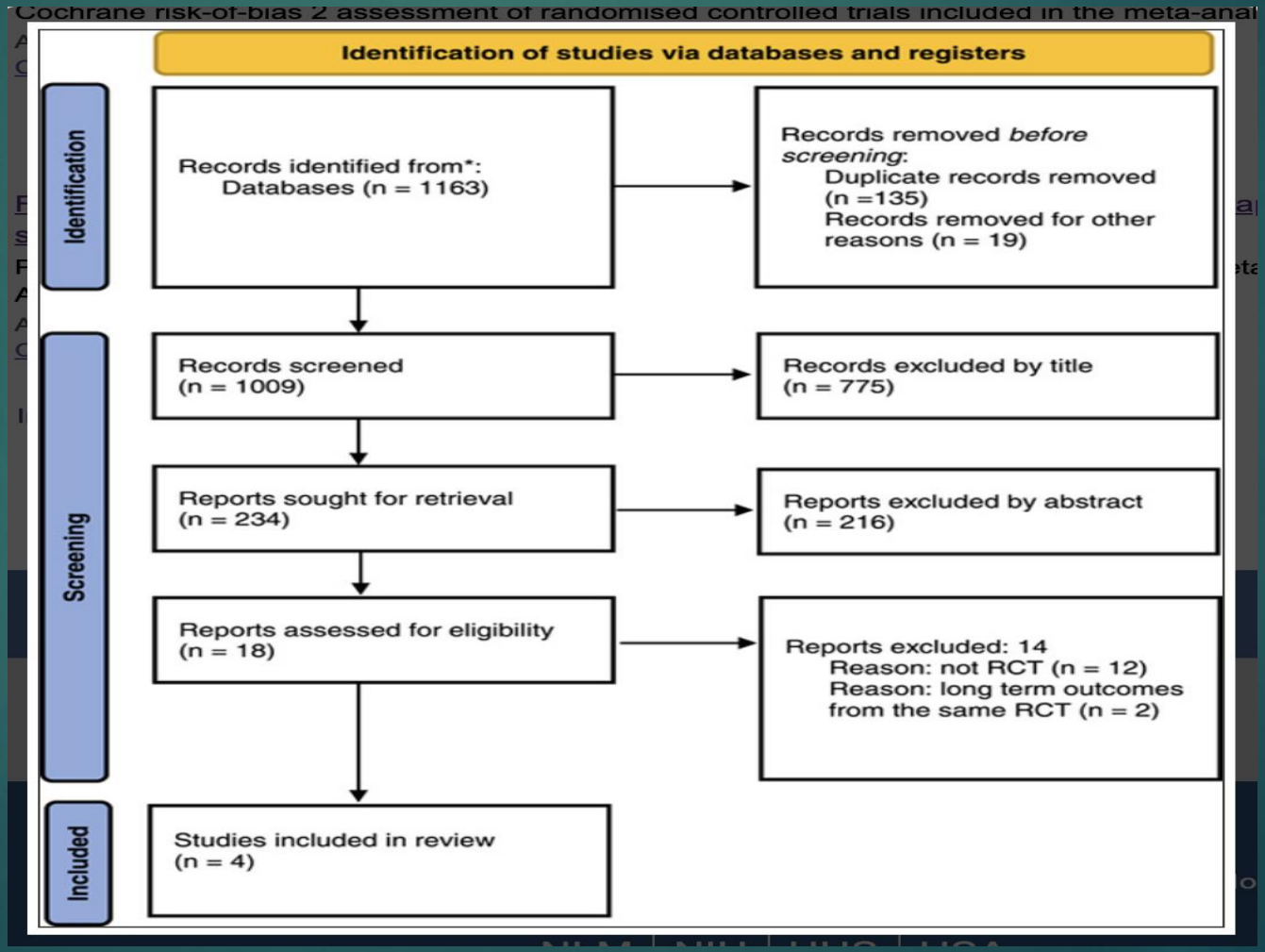
Diverticulitis & individualized management



Diverticulitis & individualized management

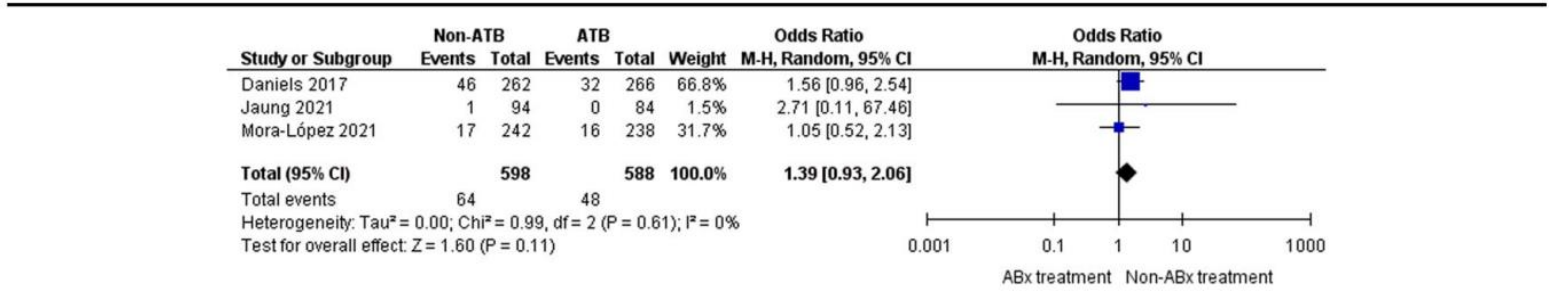


Figure 3. Readmission.

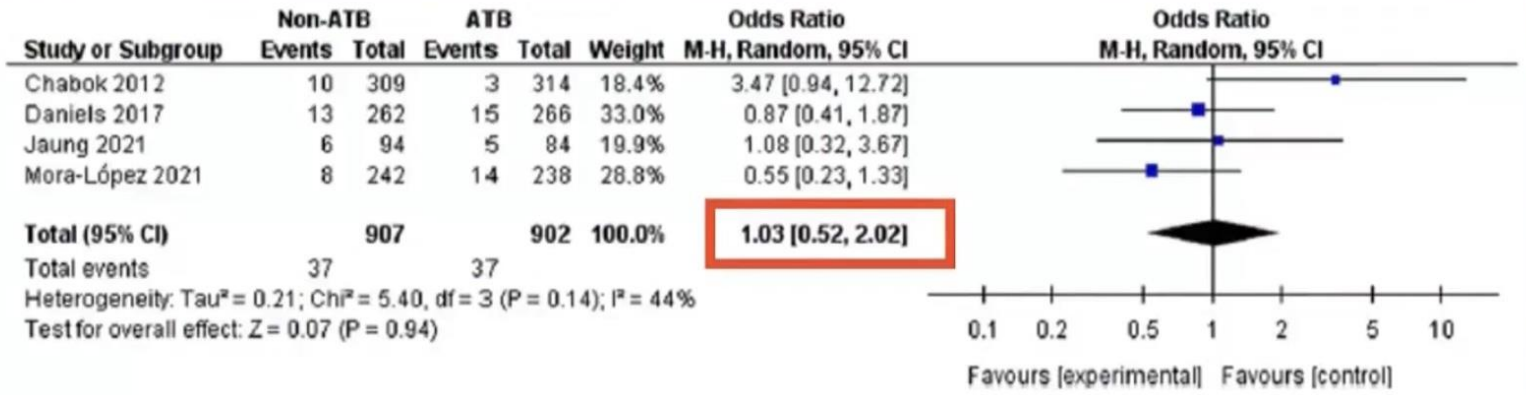
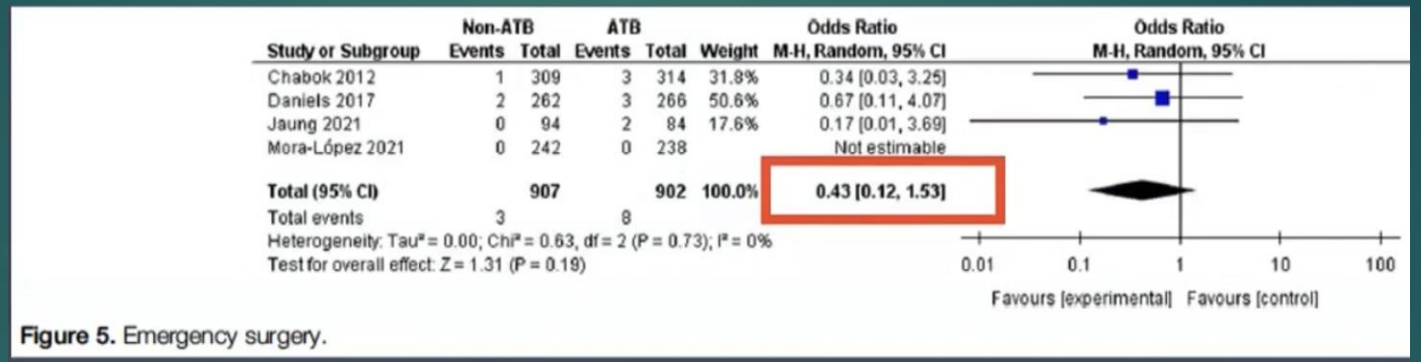


Figure 4. Change in strategy.

Diverticulitis & individualized management

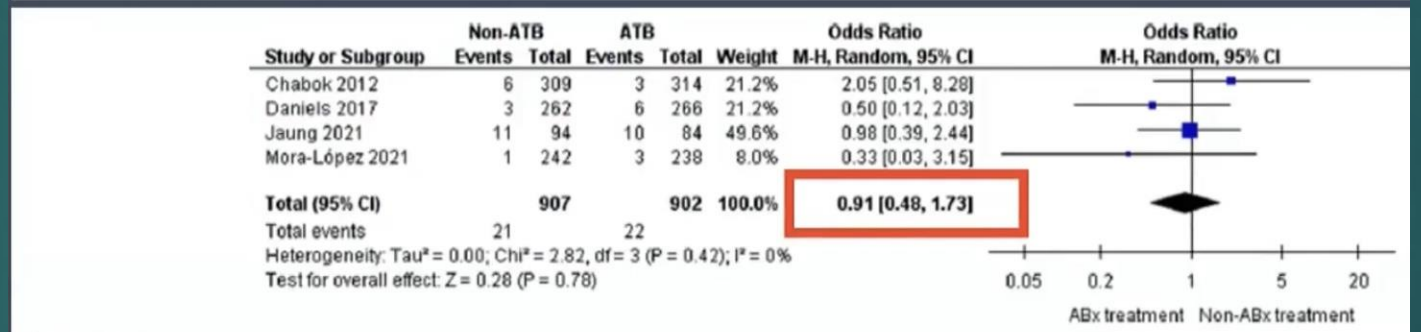


Study or Subgroup	Non-ATB Events	Non-ATB Total	ATB Events	ATB Total	Weight	Odds Ratio M-H, Random, 95% CI
Chabok 2012	1	309	3	314	31.8%	0.34 [0.03, 3.25]
Daniels 2017	2	262	3	266	50.6%	0.67 [0.11, 4.07]
Jaung 2021	0	94	2	84	17.6%	0.17 [0.01, 3.69]
Mora-López 2021	0	242	0	238		Not estimable
Total (95% CI)		**907**		**902**	**100.0%**	**0.43 [0.12, 1.53]**
Total events	3		8			

Heterogeneity: Tau² = 0.00; Chi² = 0.63, df = 2 (P = 0.73); I² = 0%
Test for overall effect: Z = 1.31 (P = 0.19)

Odds Ratio M-H, Random, 95% CI
0.01 0.1 1 10 100
Favours [experimental] Favours [control]

Figure 5. Emergency surgery.

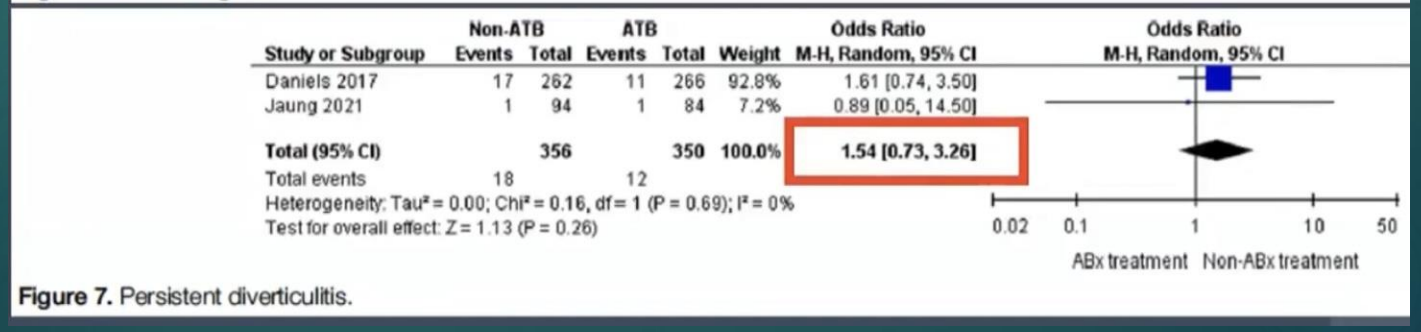


Study or Subgroup	Non-ATB Events	Non-ATB Total	ATB Events	ATB Total	Weight	Odds Ratio M-H, Random, 95% CI
Chabok 2012	6	309	3	314	21.2%	2.05 [0.51, 8.28]
Daniels 2017	3	262	6	266	21.2%	0.50 [0.12, 2.03]
Jaung 2021	11	94	10	84	49.6%	0.98 [0.39, 2.44]
Mora-López 2021	1	242	3	238	8.0%	0.33 [0.03, 3.15]
Total (95% CI)		**907**		**902**	**100.0%**	**0.91 [0.48, 1.73]**
Total events	21		22			

Heterogeneity: Tau² = 0.00; Chi² = 2.82, df = 3 (P = 0.42); I² = 0%
Test for overall effect: Z = 0.28 (P = 0.78)

Odds Ratio M-H, Random, 95% CI
0.05 0.2 1 5 20
ABx treatment Non-ABx treatment

Figure 6. Worsening.



Study or Subgroup	Non-ATB Events	Non-ATB Total	ATB Events	ATB Total	Weight	Odds Ratio M-H, Random, 95% CI
Daniels 2017	17	262	11	266	92.8%	1.61 [0.74, 3.50]
Jaung 2021	1	94	1	84	7.2%	0.89 [0.05, 14.50]
Total (95% CI)		**356**		**350**	**100.0%**	**1.54 [0.73, 3.26]**
Total events	18		12			

Heterogeneity: Tau² = 0.00; Chi² = 0.16, df = 1 (P = 0.69); I² = 0%
Test for overall effect: Z = 1.13 (P = 0.26)

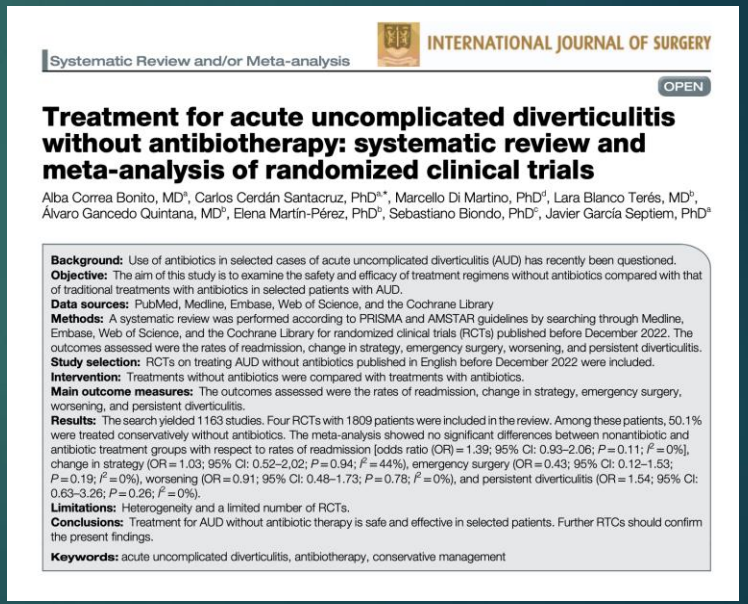
Odds Ratio M-H, Random, 95% CI
0.02 0.1 1 10 50
ABx treatment Non-ABx treatment

Figure 7. Persistent diverticulitis.

Diverticulitis & individualized management

- Uncomplicated acute diverticulitis – role of abx
  - Level 1 data show omission of antibiotics is safe and effective

    - Why do we still use abx?
      - Lack of confidence
      - Patient expectation
      - Lack of education and a awareness
      - Change in paradigm



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Diverticulitis & individualized management

- The choice of intravenous antibiotics depends on disease severity.

- Oral antibiotics :
  - amoxicillin-clavulanate,
  - ciprofloxacin/metronidazole,
  - levofloxacin/metronidazole,
  - or trimethoprim-sulfamethoxazole/metronidazole.
  - Immunocompetent patients should complete a total of 4 to 7 days of antibiotic therapy (7 to 10 days for undrained abscess or phlegmon); immunocompromised patients should be treated for 10 to 14 days.

UpToDate

Diverticulitis & individualized management

- Antibiotics advised in uncomplicated diverticulitis in patient with
  - Comorbidity & fragility
  - CRP > 140 mg/l
  - WBC > 15
  - Possible admission

Peery A etal gastroenterology 2020

Diverticulitis & individualized management

Admission criteria

Indications for hospital admission for acute colonic diverticulitis

▪ Complicated diverticulitis (ie, frank perforation, abscess, obstruction, fistula)
▪ Sepsis or SIRS (>1 of temperature >38° or <36° Celsius, heart rate >90 beats per minute, respiration rate >20 respirations per minute, white blood cell count >12,000/mL or <4000/mL, C-reactive protein >15 mg/dL)
▪ Severe abdominal pain or diffuse peritonitis, and/or failure to reduce abdominal pain in the emergency department to <5 on a VAS
▪ Microperforation (eg, a few air bubbles outside of the colon without contrast extravasation or phlegmon)
▪ Age >70 years
▪ Significant comorbidities (eg, diabetes mellitus with organ involvement [eg, retinopathy, angiopathy, nephropathy], recent cardiogenic event [eg, acute myocardial infarction, angina, heart failure], or recent decompensation of chronic liver disease [≥ Child B] or end-stage kidney disease)
▪ Immunosuppression (eg, poorly controlled diabetes mellitus, chronic high-dose corticosteroid use, use of other immunosuppressive agents, advanced HIV infection or AIDS, B or T cell leukocyte deficiency, active cancer of hematologic malignancy, or organ transplant)
▪ Intolerance of oral intake secondary to bowel obstruction or ileus
▪ Nonadherence with care/unreliability for return visits/lack of support system
▪ Failure of outpatient treatment

SIRS: systemic inflammatory response syndrome; VAS: visual analog scale.

Diverticulitis & individualized management

- Interval colonoscopy –
  - Complicated diverticulitis
    - 11% malignancy risk
  - Uncomplicated diverticulitis
    - 0.7% Malignancy risk

ANNALS OF SURGERY

META-ANALYSIS

Systematic Review and Meta-analysis of the Role of Routine Colonic Evaluation After Radiologically Confirmed Acute Diverticulitis

Sharma, Prashant V. FRACS*; Eglinton, Timothy FRACS*; Hider, Phil FAFPHM, RACP†; Frizelle, Frank FRACS*

Author Information

Annals of Surgery 259(2):p 263-272, February 2014. | *DOI:* 10.1097/SLA.0000000000000294

Diverticulitis & individualized management

- ASCRS guidelines – colonoscopy 6 weeks after resolution of complicated diverticulitis if not recently performed
- AGA guidelines – colonoscopy 6-8 weeks after complicated diverticulitis or first episode uncomplicated diverticulitis if more than 1 year since most recent scope

Diverticulitis & individualized management

- ASCRS guidelines
- patient with prior ***uncomplicated*** diverticulitis
  - against surgical resection for a prior history of uncomplicated diverticulitis that is successfully treated medically, regardless of the number of episodes
  - Age is not a factor in deciding whether to operate as young patients are no longer thought to have more frequent or complicated recurrences .

Diverticulitis & individualized management

- ASCRS guidelines
- Patients with prior ***complicated*** diverticulitis
  - Elective surgery for patients who have had a previous episode of complicated diverticulitis, even if they are currently asymptomatic, due to the elevated risk of severe complications or mortality from recurrent diverticulitis .
    - such patients are at a greater risk of developing complications or dying from a recurrent attack and therefore would benefit from early elective surgery.

Diverticulitis & individualized management

Management

Diverticulitis & individualized management

- Individualized based patient risk factors
  - Multiple episodes uncomplicated
    - Patients symptoms not a number
  - single episode complicated diverticulitis
    - Fistula , stricture or suspicious of neoplasm

Diverticulitis & individualized management

- Complicated left sided diverticulitis
  - Diverticular Abscesses (Hinchey Stages Ib and II)
  - Chronic symptoms
  - Frequent admission
  - High rate of recurrence
  - Surgery is recommended as an elective setting or according to patient condition
    - In a systematic review of 7653 patients treated with antibiotics, the overall recurrence rate was 25.5% ,, in patients treated with percutaneous drainage, the recurrence rate was 15%

      (Int J Surg. 2016;35:201-208.)

    - Abscess < 3 cm
      - Medical treatment (antibiotics)

    - Abscess > 3 cm
      - Percutaneous drainage or surgical

ASCRS Practice guidelines DCR 2020;63:728

Diverticulitis & individualized management

- Hinchey Stage III Diverticulitis
  - Nonoperative
    - In very limited cases
    - No hemodynamic instability
    - No peritonitis
    - No Persistent fever
    - No Overt connection of the colon to the peritoneal cavity by CT
      - CASE studies published (Int J Color Dis. 2017;32:1503–7.)
  - Laparoscopic lavage
    - Laparoscopic lavage, however, was associated with a significantly increased risk of intra-abdominal abscess, peritonitis, and future emergency reoperation
    - lavage has a higher initial re-intervention rate, but overall morbidity and mortality at 1 year and the need for subsequent intervention is similar to resectional surgery

Int J Color Dis. 2017;32:163–9. Br J Surg. 2017;104(1):62-68

Diverticulitis & individualized management

- **Immediate surgery needed**
  - Hinchey III or IV Diverticulitis
    - Purulent or Fecal peritonitis
    - large or multiple intra abdominal abscess no meanable for radiological drainage
  - Systemic inflammatory response syndrome (SIRS)
  - Failure of conservative treatment for complicated diverticulitis
  - Formal resection if malignancy suspected
  - Surgical option
    - Segmental resection with primary anastomosis +/- ileostomy
    - Hartman's procedure

Diverticulitis & individualized management

- Elective surgery is indicated in the following
  - Fistulas , stricture and symptoms of obstruction (could not pass the scope)
  - Symptomatic , recurrence , chronic , uncomplicated
    - Chronic abdominal discomfort
    - Change in bowel habit and stool character
    - GI stress
  - Segmental colitis associated disease
  - Atypical disease
  - SUDD

Diverticulitis & individualized management

- Chronic Uncomplicated Disease
  - Complications of diverticulitis are most likely to occur with a first episode and prophylactic surgery to prevent complicated disease is not justified
- The decision to perform surgery should be a shared one, which weighs the potential improvement in quality of life against the risks of surgery.
- The decision for surgery should be individualized, based on severity of symptoms and interference with overall quality of life.
- Patients should have CT confirmation of the diagnosis of acute diverticulitis, as symptoms from irritable bowel syndrome may mimic ongoing inflammation or recurrent attacks.

Dis Colon Rectum. 2000;43(3):290-7

Dis Colon Rectum. 2011;54(3):283-8.

Diverticulitis & individualized management

- Surgical management and time of the intervention principles
  - Minimally invasive surgery when safe
    - Laparoscopic vs robotics
  - Resection with anastomosis
    - All disease bowel to be resected
    - If left side , to the upper rectum
  - Difficult anastomosis or unstable patient
    - Decision intraoperatively

Diverticulitis & individualized management

- Acuna SA et al
  - Operative Strategies for Perforated Diverticulitis: A Systematic Review and Meta-analysis
    - The purpose of this study was to compare operative strategies for perforated diverticulitis.
    - Randomized clinical trials evaluating operative strategies for perforated diverticulitis.
    - Hartmann procedure, primary resection and anastomosis, and laparoscopic lavage
    - Six trials including 626 patients with perforated diverticulitis

Acuna SA . Dis Colon Rectum.2018;61:1442

Diverticulitis & individualized management

PROCEDURE (Purulent/Feculent)

Trial name	Intervention arm	No. of randomly assigned participants	Hinchey classification, n (%)	Age, mean (SD), y	Women, n (%)	BMI, mean (SD)	Previous diverticulitis, n (%)	Previous abdominal surgery, n (%)	ASA >III, n (%)
DIVERTI[5]	PRA	50	III: 42 (84) IV: 8 (16)	61 (25 ± 93)[a]	22 (44.0)	26.1 (20 ± 43)[b]	NR	NR	NR
	Hartmann	52	III: 40 (76.5) IV: 12 (23.5)	61.5 (25 ± 93)[a]	29 (55.8)	26.8 (19.3 ± 44.6)[b]	NR	NR	NR
DILALA[1]	Lap. lavage	43	III: 43 (100)	64 (50 ± 76)[a]	22 (51)	25.6 (21 ± 32)[b]	5 (12)	20 (47)	0 (0)
	Hartmann	40	III: 40 (100)	68 (56 ± 79)[a]	24 (60)	24.9 (19 ± 36)[b]	5 (13)	13 (33)	2 (5)
LOLA[3]	Lap. lavage	46	III: 46 (100)	62.3 (12.7)	20 (43)	27.6 (6.2)	12 (32)	4 (9)	3 (7)
	Bowel resection[c]	42	III: 42 (100)	64.0 (12.3)	17 (40)	27.0 (4.4)	10 (26)	3 (7)	2 (5)
SCANDIV[2]	Lap. lavage	101	I: 3 (3) II:1 (1) III: 70 (79) IV: 15 (17)[d]	69.9 (13.5)	57 (56)	26.6 (4.9)	19 (19)	34 (34)	9 (9)
	Bowel resection[e]	96	I: 2 (2) II: 4 (5) III: 64 (77) IV: 13 (16)[d]	65.7 (15.2)	51 (53)	26.0 (4.4)	24 (25)	36 (37)	5 (5)
Oberkofler et al[4]	PRA	32	III: 24 (75) IV: 8 (25)	72 (60 ± 83)[a]	20 (62.5)	24 (23 ± 28)[b]	NR	NR	8 (27)
	Hartmann	30	III: 23 (77) IV: 7 (23)	74 (61 ± 81)[a]	21 (65.6)	24 (22 ± 29)[b]	NR	NR	8 (25)
Binda et al[6]	PRA	34	III: 30 (88) IV: 4 (12)	63.5 (2.2)	12 (35.3)	NR	NR	12	NR
	Hartmann	56	III: 45 (80) IV: 11 (20)	65.7 (1.8)	29 (51.8)	NR	NR	27	NR

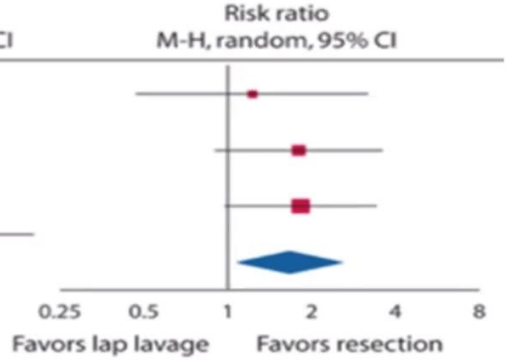
Acuna SA . Dis Colon Rectum.2018;61:1442

COMPARISON (LAVAGE vs. RESECTION)

Major postoperative complications (Clavien-Dindo > IIIa)

Trial	Laparoscopic lavage Events	Laparoscopic lavage Total	Bowel resection Events	Bowel resection Total	Weight	Risk ratio M-H, random, 95% CI
DILALA 2016[1]	8	38	6	35	19.4%	1.23 [0.47—3.19]
SCANDIV 2015[2]	19	74	10	70	36.7%	1.80 [0.90—3.59]
LOLA 2015[3]	20	46	10	42	43.9%	1.83 [0.97—3.44]
Total	47	158	26	147	100.0%	1.68 [1.10—2.56]

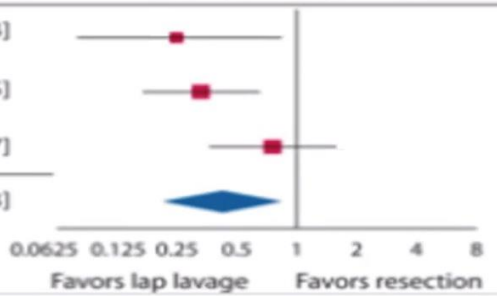
Heterogeneity: $\tau^2 = 0.00$; $\chi^2 = 0.52$, DF = 2 ($p = 0.77$); $I^2 = 0\%$
Test for overall effect: Z = 2.43, $p = 0.02$



Patients with stoma at 12 months

Trial	Laparoscopic lavage Events	Laparoscopic lavage Total	Bowel resection Events	Bowel resection Total	Weight	Risk ratio M-H, random, 95% CI
DILALA 2016[1]	3	43	11	40	21.0%	0.25 [0.08—0.84]
SCANDIV 2017[2]	9	65	26	62	40.9%	0.33 [0.17—0.65]
LOLA 2015[3]	10	46	12	42	38.1%	0.76 [0.37—1.57]
Total	22	154	49	144	100.0%	0.43 [0.22—0.83]

Heterogeneity: $\tau^2 = 0.15$; $\chi^2 = 3.73$, DF = 2 ($p = 0.15$); $I^2 = 46\%$
Test for overall effect: Z = 2.53, $p = 0.01$



No difference in EARLY reoperations and mortality

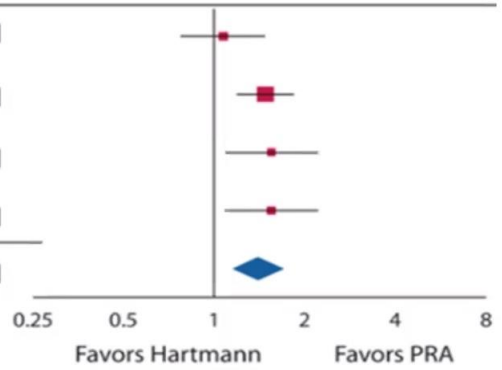
Acuna SA . Dis Colon Rectum.2018;61:1442

Diverticulitis & individualized management

Stoma free at 12 months

Trial	PRA Events	PRA Total	Hartmann procedure Events	Hartmann procedure Total	Weight	Risk ratio M-H, random, 95% CI
Binda 2012[6]	22	34	34	56	22.6%	1.07 [0.77—1.48]
DIVERTI 2017[5]	46	48	31	48	41.2%	1.48 [1.19—1.84]
Oberkofler 2012[4]	26	29	15	26	19.9%	1.55 [1.09—2.21]
LOLA 2015[3]	19	21	12	21	16.3%	1.55 [1.09—2.21]
Total	113	132	92	151	10\ %	1.40 [1.18—1.67]

Heterogeneity: $\tau^2 = 0.01$; $\chi^2 = 3.73$, DF = 3 ($p = 0.29$); $I^2 = 20\%$
Test for overall effect: $Z = 3.89$, $p < 0.001$



No difference in minor or major complications, reoperations, and/or mortality

Acuna SA . Dis Colon Rectum.2018;61:1442

Diverticulitis & individualized management

- Perforated diverticulitis Hinchey III & IV
  - Compared to resection , laparoscopic lavage is associated with higher risk of major complications (LL :35% vs PA :18 %)
  - Compered to Hartman's , Primary Resection and Anastomosis (PRA) associated with a lower rate of persistent stoma compared to Hartmann procedure at 12 months
  - Similar mortality at 12 months

Acuna SA . Dis Colon Rectum.2018;61:1442

Diverticulitis & individualized management

- Laparoscopic Elective sigmoid colectomy vs conservative treatment , symptomatic LASER trail
  - Assessing the GI QoL , complication , recurrence
  - LASER trail
    - At 6 months (2021)
    - At 2 years (2023)
    - At 4 years (2025)

JAMA Surgery | Original Investigation

Comparing Laparoscopic Elective Sigmoid Resection With Conservative Treatment in Improving Quality of Life of Patients With Diverticulitis
The Laparoscopic Elective Sigmoid Resection Following Diverticulitis (LASER) Randomized Clinical Trial

Alexandre Santos, MD; Panu Mentula, MD, PhD; Tarja Pinta, MD, PhD; Shamel Ismail, MD; Tero Rautio, MD, PhD; Risto Juusela, MD; Aleksi Lähdesmäki, MD, PhD; Tom Scheinin, MD, PhD; Ville Sallinen, MD, PhD

Diverticulitis & individualized management

JAMA Surgery | Original Investigation

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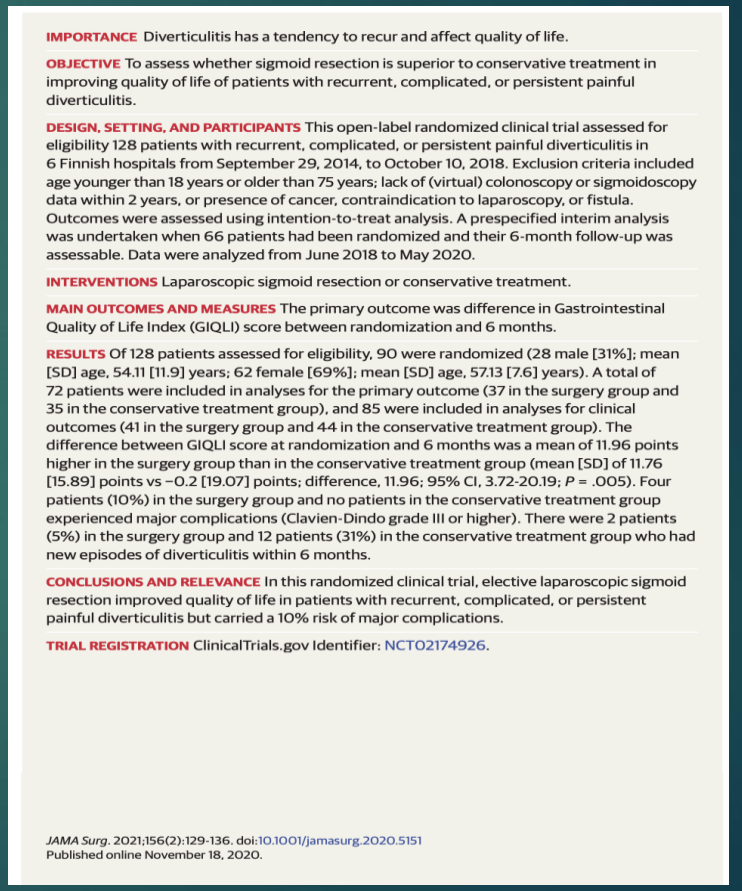
- Randomized clinical trial (Finnish)
- Multicenter , 128 patients
- Population – recurrent complicated or persistent symptoms of diverticulitis
  - Excluded – no colonoscopy , cancer , contraindication for MIS , fistula
- Outcome- Difference in GI Qol score at 6 months

Diverticulitis & individualized management

- 6 months result :
- Interval sigmoidoscopy
  - Appropriate MIS surgical candidate have improved pain and quality of life at 6 months with low risk of complication
  - 5 % risk of temporary stoma
  - 10 % risk Major complications



IMPORTANCE Diverticulitis has a tendency to recur and affect quality of life.

OBJECTIVE To assess whether sigmoid resection is superior to conservative treatment in improving quality of life of patients with recurrent, complicated, or persistent painful diverticulitis.

DESIGN, SETTING, AND PARTICIPANTS This open-label randomized clinical trial assessed for eligibility 128 patients with recurrent, complicated, or persistent painful diverticulitis in 6 Finnish hospitals from September 29, 2014, to October 10, 2018. Exclusion criteria included age younger than 18 years or older than 75 years; lack of (virtual) colonoscopy or sigmoidoscopy data within 2 years, or presence of cancer, contraindication to laparoscopy, or fistula. Outcomes were assessed using intention-to-treat analysis. A prespecified interim analysis was undertaken when 66 patients had been randomized and their 6-month follow-up was assessable. Data were analyzed from June 2018 to May 2020.

INTERVENTIONS Laparoscopic sigmoid resection or conservative treatment.

MAIN OUTCOMES AND MEASURES The primary outcome was difference in Gastrointestinal Quality of Life Index (GIQLI) score between randomization and 6 months.

RESULTS Of 128 patients assessed for eligibility, 90 were randomized (28 male [31%]; mean [SD] age, 54.11 [11.9] years; 62 female [69%]; mean [SD] age, 57.13 [7.6] years). A total of 72 patients were included in analyses for the primary outcome (37 in the surgery group and 35 in the conservative treatment group), and 85 were included in analyses for clinical outcomes (41 in the surgery group and 44 in the conservative treatment group). The difference between GIQLI score at randomization and 6 months was a mean of 11.96 points higher in the surgery group than in the conservative treatment group (mean [SD] of 11.76 [15.89] points vs −0.2 [19.07] points; difference, 11.96; 95% CI, 3.72-20.19; $P = .005$). Four patients (10%) in the surgery group and no patients in the conservative treatment group experienced major complications (Clavien-Dindo grade III or higher). There were 2 patients (5%) in the surgery group and 12 patients (31%) in the conservative treatment group who had new episodes of diverticulitis within 6 months.

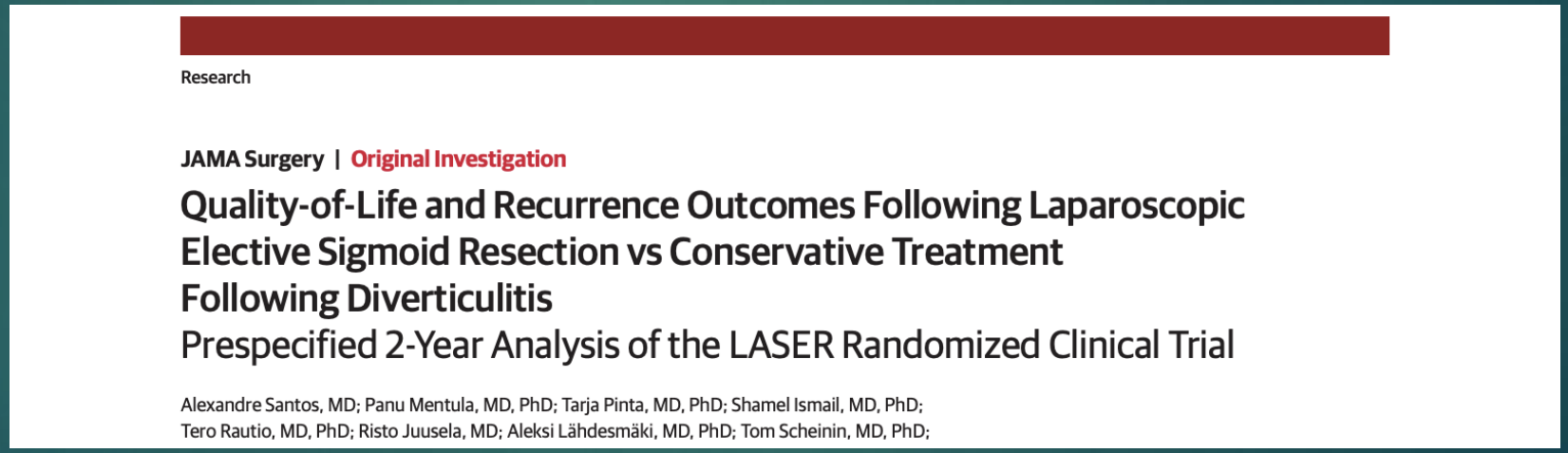
CONCLUSIONS AND RELEVANCE In this randomized clinical trial, elective laparoscopic sigmoid resection improved quality of life in patients with recurrent, complicated, or persistent painful diverticulitis but carried a 10% risk of major complications.

TRIAL REGISTRATION ClinicalTrials.gov Identifier: NCT02174926.

JAMA Surg. 2021;156(2):129-136. doi:10.1001/jamasurg.2020.5151
Published online November 18, 2020.

Diverticulitis & individualized management

- LASER trial after 2 years
  - GI QoL
  - Recurrence



Research

JAMA Surgery | Original Investigation

Quality-of-Life and Recurrence Outcomes Following Laparoscopic Elective Sigmoid Resection vs Conservative Treatment Following Diverticulitis

Prespecified 2-Year Analysis of the LASER Randomized Clinical Trial

Alexandre Santos, MD; Panu Mentula, MD, PhD; Tarja Pinta, MD, PhD; Shamel Ismail, MD, PhD; Tero Rautio, MD, PhD; Risto Juusela, MD; Aleksi Lähdesmäki, MD, PhD; Tom Scheinin, MD, PhD;

Diverticulitis & individualized management

Research

JAMA Surgery | Original Investigation

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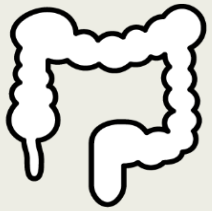
JAMA Surgery

RCT: Quality-of-Life and Recurrence Outcomes Following Laparoscopic Elective Sigmoid Resection vs Conservative Treatment Following Diverticulitis

POPULATION

28 Men, 62 Women



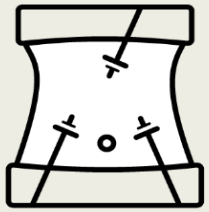
Patients with recurrent, complicated, or persisting painful diverticulitis

Mean (SD) age, 54.11 y (11.9)

INTERVENTION

90 Patients randomized

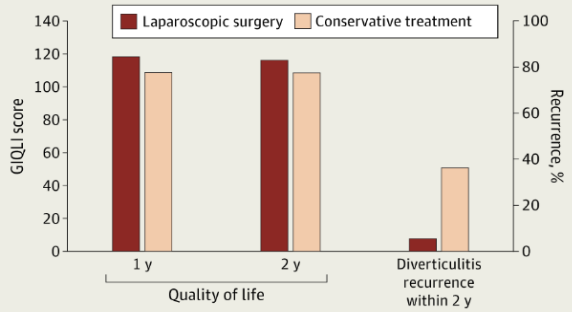
45 Conservative treatment
Written counseling and fiber supplements



45 Surgery
Elective laparoscopic sigmoidectomy

FINDINGS

Elective laparoscopic sigmoidectomy was associated with improved quality of life at 1 y and lower rate of recurrence compared with conservative treatment



Mean GIQLI score at 1 y:
118.5 in surgery group vs 109.0 in conservative group (difference, 9.5; 95% CI, 0.83-18.18; *P* = .03)

SETTINGS / LOCATIONS

Five Finnish hospitals

PRESPECIFIED SECONDARY OUTCOMES

Gastrointestinal Quality of Life (GIQLI) score at 1 y and 2 y (range, 0-144, with higher scores indicating better quality of life) and recurrence of diverticulitis

Santos A, Mentula P, Pinta T, et al. Quality-of-life and recurrence outcomes following laparoscopic elective sigmoid resection vs conservative treatment following diverticulitis: prespecified 2-year analysis of the LASER randomized clinical trial. *JAMA Surg*. Published online April 19, 2023. doi:10.1001/jamasurg.2023.0466

Diverticulitis & individualized management

Research

JAMA Surgery | Original Investigation

Quality-of-Life and Recurrence Outcomes Following Laparoscopic Elective Sigmoid Resection vs Conservative Treatment Following Diverticulitis

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CONCLUSIONS AND RELEVANCE In this randomized clinical trial, elective sigmoid resection was effective in preventing recurrent diverticulitis and improved quality of life over conservative treatment within 2 years.

Diverticulitis & individualized management

- LASER trail at 4 years
  - 2025
  - GI QoI
  - Recurrence
  - complication
  - Gastrointestinal Quality of Life Index (GIQLI) scores, complications, and recurrences, within 4 years are reported using intention-to-treat and post hoc per-protocol analyses.

JAMA Surgery | Original Investigation

Sigmoid Resection vs Conservative Treatment After Diverticulitis
Prespecified 4-Year Analysis of the LASER Randomized Clinical Trial

Alexandre Santos, MD; Panu Mentula, MD, PhD; Tarja Pinta, MD, PhD; Shamel Ismail, MD, PhD; Tero Rautio, MD, PhD; Risto Juusela, MD; Aleksi Lähdesmäki, MD, PhD; Tom Scheinin, MD, PhD; Ville Sallinen, MD, PhD

Diverticulitis & individualized management

JAMA Surgery | Original Investigation

Sigmoid Resection vs Conservative Treatment After Diverticulitis
Prespecified 4-Year Analysis of the LASER Randomized Clinical Trial

Alexandre Santos, MD; Panu Mentula, MD, PhD; Tarja Pinta, MD, PhD; Shamel Ismail, MD, PhD;
Tero Rautio, MD, PhD; Risto Juusela, MD; Aleksi Lähdesmäki, MD, PhD;
Tom Scheinin, MD, PhD; Ville Sallinen, MD, PhD

- 90 enrolled patients
- 45 elective sigmoid resection and 45 to conservative treatment.
- Among those randomized to conservative treatment, 14 of 44 (32%) underwent sigmoid resection within 4 years (patients with lower QOL on average).
- The mean (SD) GIQLI score was 115.3 (17.8) in the surgery group vs 109.8 (19.8) in the conservative treatment group
- Recurrence of diverticulitis occurred in 6 of 38 patients (16%) in the surgery group vs 34 of 37 patients (92%) in the conservative treatment group.
- Severe postoperative complications occurred in 4 patients (10%) in the surgery group vs 5 patients (11%) in the conservative treatment group.

Diverticulitis & individualized management

JAMA Surgery

JAMA Surgery | Original Investigation

Sigmoid Resection vs Conservative Treatment After Diverticulitis
Prespecified 4-Year Analysis of the LASER Randomized Clinical Trial

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RCT: Sigmoid Resection vs Conservative Treatment After Diverticulitis

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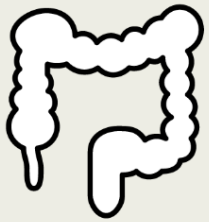
28 Men, 62 Women



Adults with recurring, persistent painful, or complicated diverticulitis

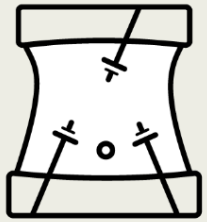
Median age: 59 y

SETTINGS / LOCATIONS

6 Hospitals in Finland

INTERVENTION

78 Participants analyzed



38 Surgery
Elective laparoscopic sigmoid resection within 3 mo of randomization

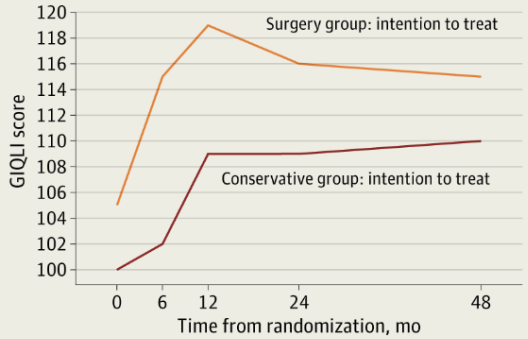
40 Conservative management
Educational materials on constipation and diverticulosis, with option for elective surgery after 6 mo

PRIMARY OUTCOME

Quality of life, measured via the Gastrointestinal Quality of Life Index (GIQLI) score (range, 0-144, with higher values indicating better quality of life) at 48 mo

FINDINGS

There was no significant difference between the surgery and conservative management groups in quality of life at 48 mo



Mean between-group difference in GIQLI score at 4 y:
5.54 (95% CI, -2.98 to 14.06)

Santos A, Mentula P, Pinta T, et al. Sigmoid resection vs conservative treatment after diverticulitis: prespecified 4-year analysis of the LASER randomized clinical trial. *JAMA Surg*. Published online April 9, 2025. doi:10.1001/jamasurg.2025.0572

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JAMA Surgery | Original Investigation

Sigmoid Resection vs Conservative Treatment After Diverticulitis
Prespecified 4-Year Analysis of the LASER Randomized Clinical Trial

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- Results
- High crossover rates from conservative treatment to surgery indicate that patients with low QOL in the conservative treatment group often require surgical intervention;
- Elective sigmoid resection did not improve QOL compared with conservative treatment in 4-year follow-up, even though it was effective in preventing recurrences of diverticulitis and did not lead to increased rates of postoperative complications.
- Upfront surgery may be preferable in patients with low QOL, but initial conservative treatment is an option for patients with near-normal QOL.

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Conclusions

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- Surgery should aim primarily at improving quality of life and to be patient focused
- The decision to perform elective surgery after several episodes of recurrent uncomplicated diverticulitis should be individualized
- Safe to omit antibiotics in selected patient with uncomplicated diverticulitis
- 11% malignancy risk with complicated diverticulitis → interval colonoscopy recommended and can save life
- Minimally invasive surgery is an acceptable option for managing diverticulitis and its complications (laparoscopic /robotics)

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- Laparoscopic lavage can be employed in some patients with Hinchey III diverticulitis in a limited clinical setting since has a high post operative complications
- Interval MIS improves QoL with low risk in patients with recurrent , complicated or smoldering diverticulitis
- In a hemodynamically stable Immunocompetent patient with Hinchy III/IV diverticulitis , compared to Hartmann's procedure
  - PA is safe
  - PA may have fewer days in the hospital
  - PA will have less hernia
  - PA less rate of stoma

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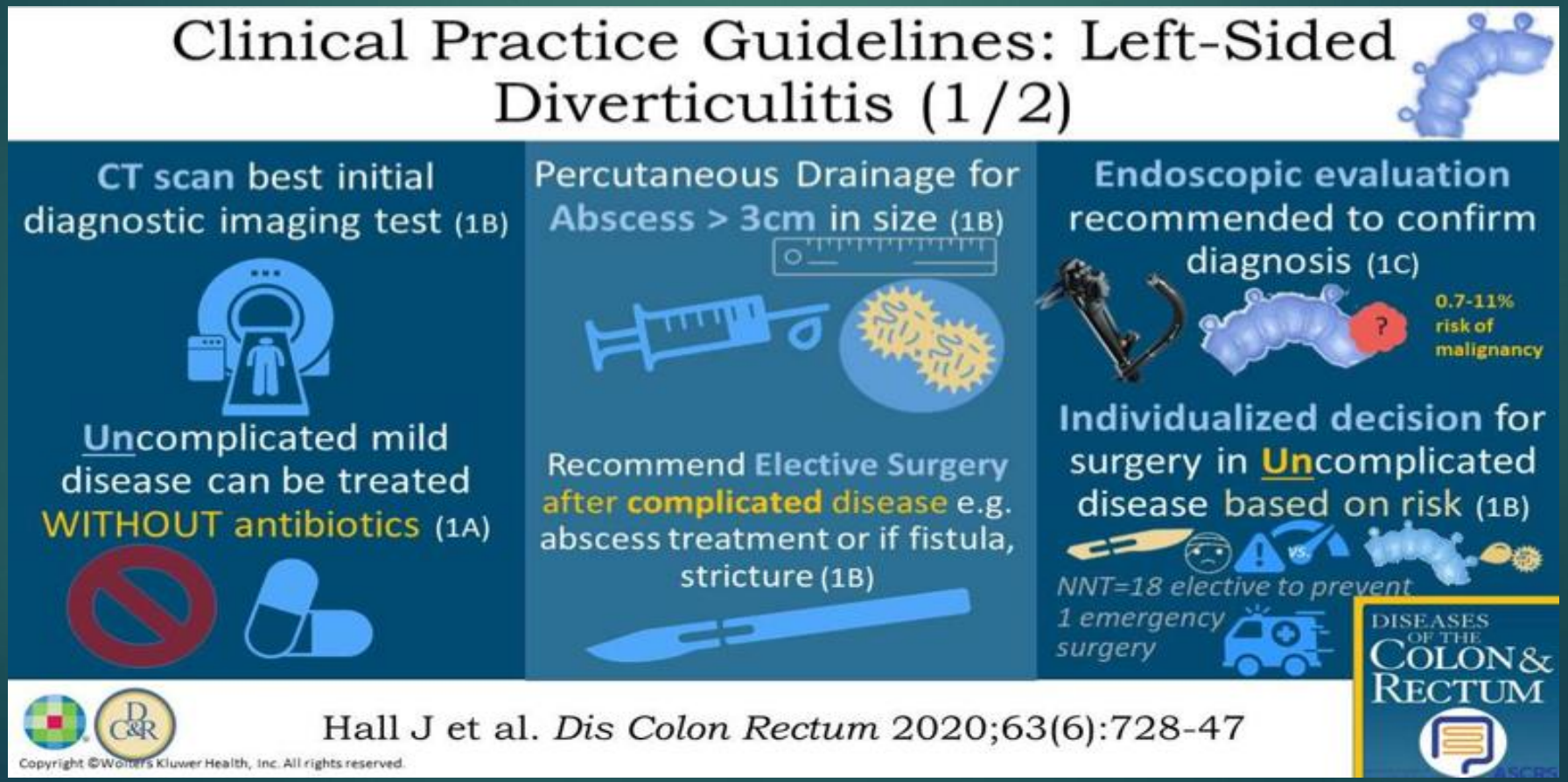
Conclusions



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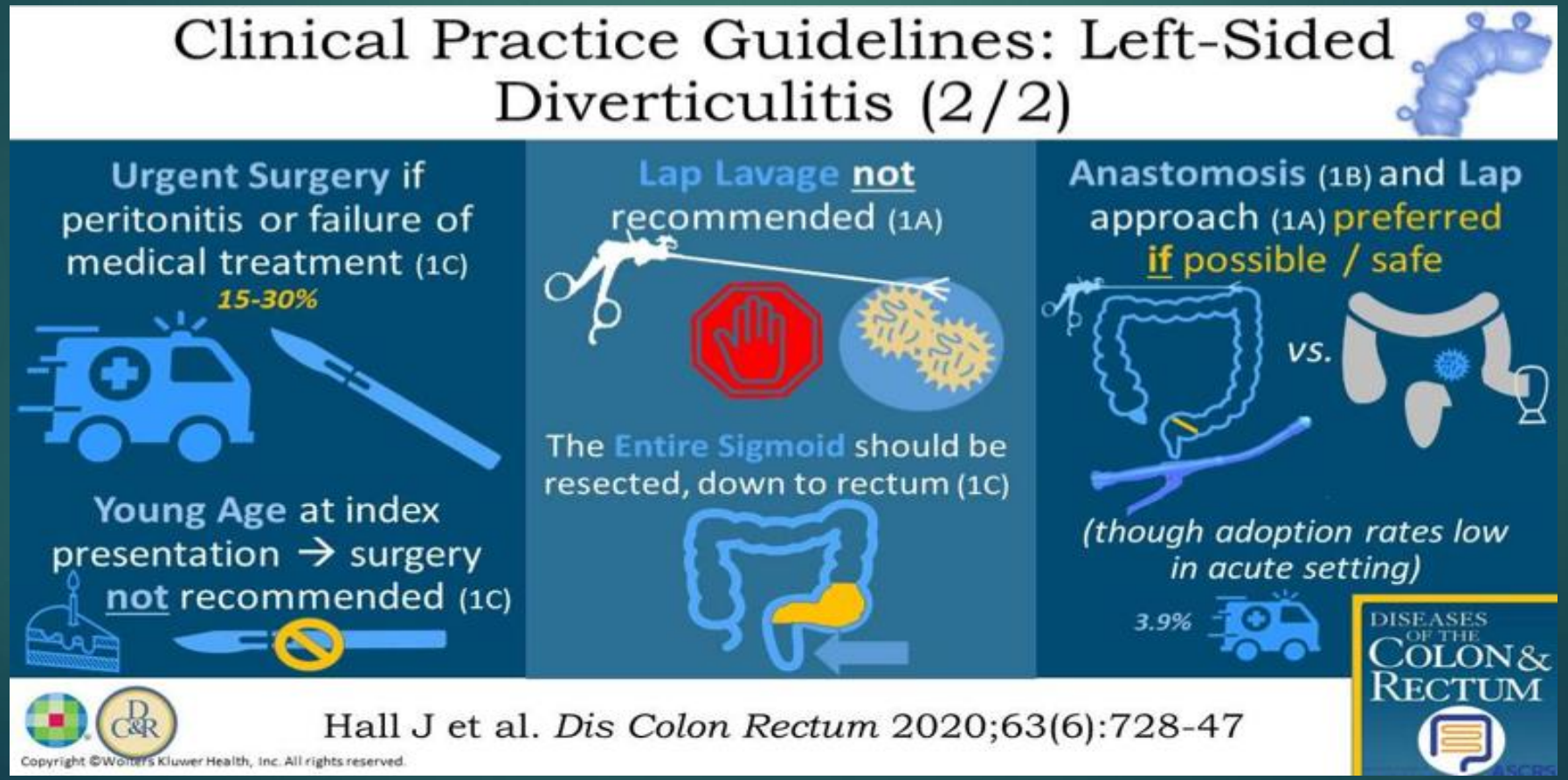
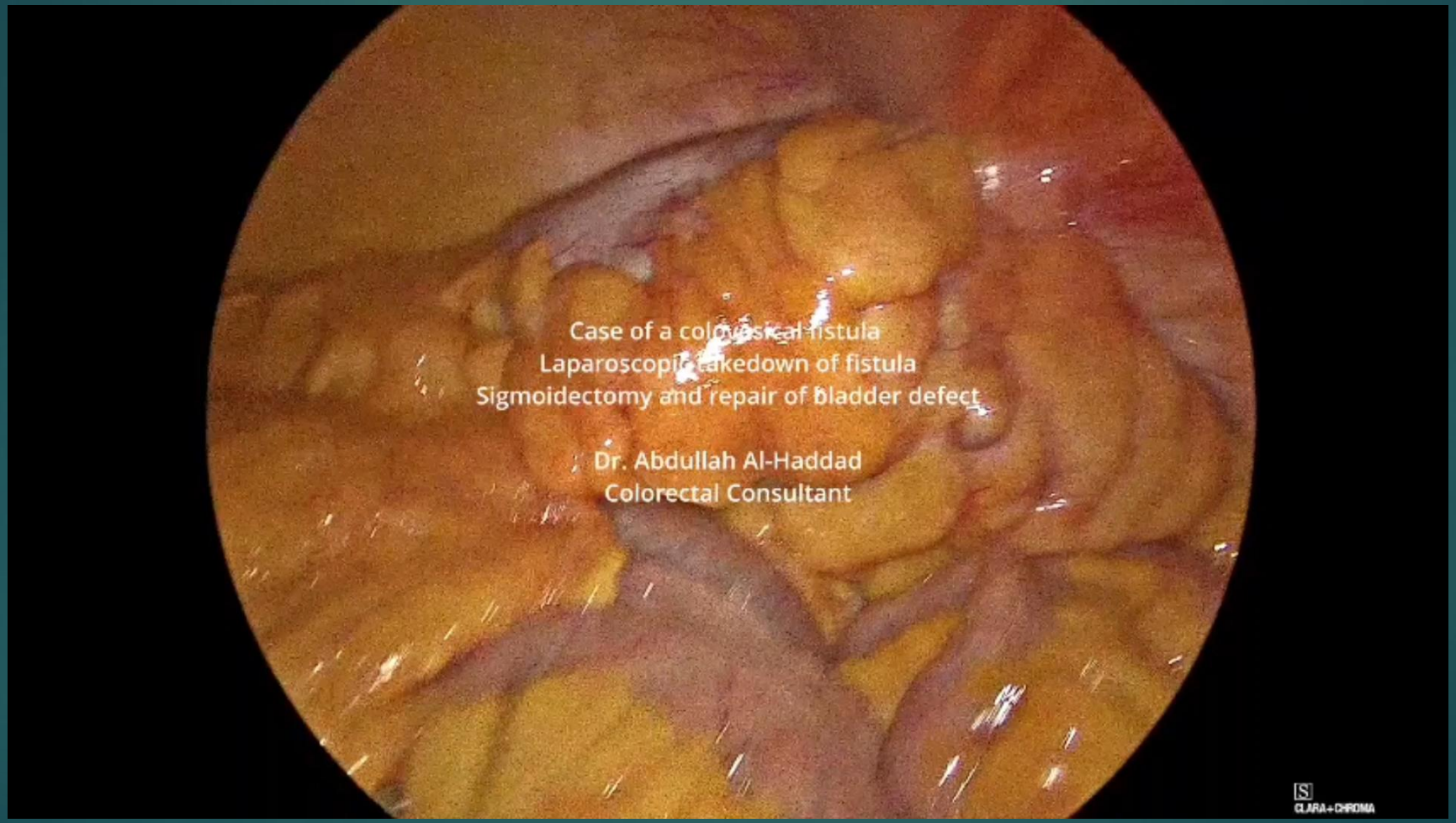
Conclusions



Diverticulitis – Colo-vesical fistula



Thank you