

**Abdominal drainage after  
laparoscopic appendectomy  
in children  
should or shouldn't?**

Bs. Trần Thanh Trí

Bs. Lưu Nguyễn An Thuận

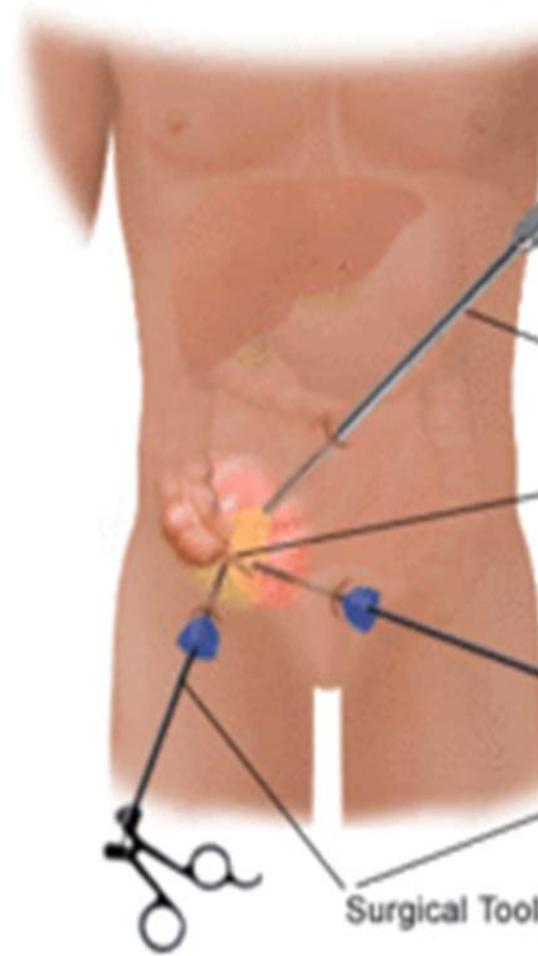
# Introduction:

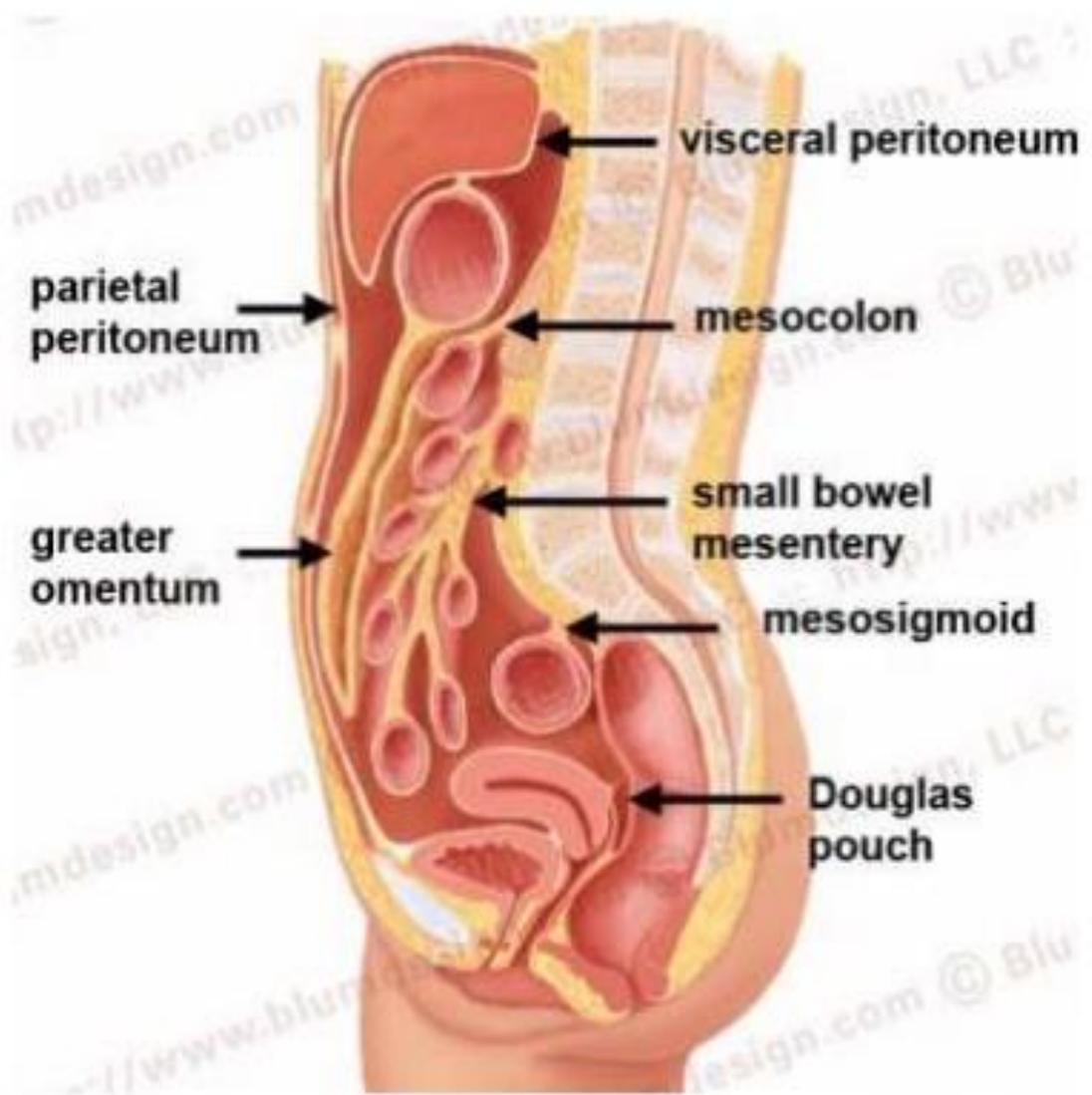
- ▶ The first use of abdominal drainage is attributed to Hippocrates (460–377 BC)
- ▶ In 1887, Lawson Tait defended, “When in doubt, drain.”
- ▶ In 1905, Yates published a study of the use of abdominal drains and he concluded: “Drainage of the peritoneal cavity was physically and physiologically impossible”

# Background

- ▶ Perforated appendicitis is more frequent in children than in adults, especially in infants and younger children in whom the rate of perforation can reach 55%– 80%.
- ▶ complicated appendicitis, defined as gangrenous or perforated appendicitis
- ▶ One of the most serious complications of perforated appendicitis is the postoperative abscess formation

Laparoscopic Appendectomy  
(Appendix Removal)





## Benefit from abdominal drains

- Remove intraperitoneal fluids like blood, ascites, or intestinal juice
- Detect early complications such as postoperative bleed or anastomotic leakage

The complications of the drains are numerous

- foreign body effects
- mechanical problems
- physiological issues (pain, emphysema, pneumoperitoneum)
- inadequate drainage

# Research of Belén Aneiros Castro, Department of Pediatric Surgery Hospital, Scandinavian Journal of Surgery 2018, Vol. 107(3) 197–200

## *Surgical techniques.*

	Extracorporeal	Endoloops	Endostapler
No-drainage	63 (85.1%)	5 (6.8%)	6 (8.1%)
Drainage	79 (68.1%)	9 (7.8%)	28 (24.1%)

TABLE 2

## *Postoperative complications.*

	No-drainage	Drainage	p value
Intra-abdominal abscess	17 (22.6%)	34 (29%)	0.32
Wound infection	5 (6.6%)	5 (4.2%)	0.46
Bowel obstruction	1 (1.3%)	6 (5.1%)	0.17

# Results:

- ▶ 121 were male and 71 were female with a mean age of  $7.77 \pm 3.4$  years.
- ▶ there were not statistically significant differences between the groups in gender ( $p = 0.82$ ) and mean age ( $p = 0.31$ ).
- ▶ there were no statistically significant differences between the two groups in the rate of intra-abdominal abscess, wound infection, and bowel obstruction ( $p = 0.92$  and  $p = 0.83$ , respectively)
- ▶ however, the drainage group has been statistically associated with an increased requirement of antibiotic and analgesic medication, fasting time, operative time, and length of hospital stay.

# Abdominal drainage to prevent intra-peritoneal abscess after open appendectomy for complicated appendicitis (Li Z, Zhao L, Cheng Y, Cheng N, Deng Y )

## SUMMARY OF FINDINGS FOR THE MAIN COMPARISON *[Explanation]*

### Abdominal drainage to prevent intra-peritoneal abscess after open appendectomy for complicated appendicitis

**Patient or population:** people undergoing emergency open appendectomy for complicated appendicitis

**Setting:** hospital

**Intervention:** drainage

**Comparison:** no drainage

Outcomes	Anticipated absolute effects* (95% CI)		Relative effect (95% CI)	No of participants (studies)	Quality of the evidence (GRADE)	Comments
	Risk with no drain use	Risk with drain use				
<b>Intra-peritoneal abscess</b> Follow-up: 14 days	107 per 1000	131 per 1000 (50 to 342)	<b>RR 1.23</b> (0.47 to 3.21)	453 (5 studies)	⊕○○○ Very low <sup>a,b,c</sup>	
<b>Wound infection</b> Follow-up: 30 days	254 per 1000	511 per 1000 (224 to 1000)	<b>RR 2.01</b> (0.88 to 4.56)	478 (5 studies)	⊕○○○ Very low <sup>a,b,c</sup>	
<b>Morbidity</b> Follow-up: 30 days	67 per 1000	445 per 1000 (142 to 1000)	<b>RR 6.67</b> (2.13 to 20.87)	90 (1 study)	⊕○○○ Very low <sup>a,c</sup>	
<b>Mortality</b> Follow-up: 30 days month	6 per 1000	27 per 1000 (7 to 101)	<b>Peto OR 4.88</b> (1.18 to 20.09)	363 (4 studies)	⊕⊕⊕○ Moderate <sup>a</sup>	
<b>Hospital stay (days)</b>	The mean hospital stay in the control groups was 4.60 days	The mean hospital stay in the intervention groups was <b>2.17 days higher</b> (1.76 days to 2.58 days higher)	<b>MD 2.17 days higher</b> (1.76 higher to 2.58 higher)	298 (3 studies)	⊕○○○ Very low <sup>a,d</sup>	
<b>Hospital cost</b>	Not reported					
<b>Pain</b>	Not reported					

# Research of Francisco Schlottmann in International Journal of Surgery

- ▶ In the study period 1300 laparoscopic appendectomies were performed
- ▶ Group 1: with intraabdominal drain and Group 2: no drain

## Intraoperative variables.

Intraoperative variables	G1 (n:56)	G2 (n:169)	p
Conversion (%)	11 (19.6)	12 (7.1)	0.007
Operative time minutes	97.2 (30–185)	80.7 (20–200)	NS

**Table 3**

## Postoperative variables.

Postoperative variables	G1 (n:56)	G2 (n:169)	p
Overall morbidity (%)	18 (32.1)	36 (21.3)	NS
Clavien I-II (%)	11 (19.6)	25 (14.8)	
Clavien III – IV (%)	7 (12.5)	11 (6.5)	
Clavien V	0	0	
IAA (%)	8 (14.2)	15 (8.9)	NS
Length of stay days	5.2 (1–27)	2.9 (1–22)	0.001

IAA: Intraabdominal abscess.

# Result:

- ▶ The rate of postoperative intraabdominal abscess (IAA) did not significantly differ between the two groups (G1: 14.2% vs. G2: 8.9%, p: NS)
- ▶ Median hospital stay was significantly higher in G1 (G1: 5.2 days vs. G2: 2.9 days, p: 0.001)

# Conclusion:

- ▶ Drainage after open or endoscopic appendectomy is uncertainly benefit
- ▶ No different outcomes between drainage and no drainage
- ▶ Drainage after surgery may produce some complications : foreign body effects, mechanical problems, physiological issues (pain, emphysema, pneumoperitoneum), or inadequate drainage
- ▶ There is no evidence show the benefit of drains to prevent abcess formation

# References

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Thank you

