

粘连性腹内疝手术并发症危险因素分析

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收稿日期: 2025年12月7日; 录用日期: 2026年1月1日; 发布日期: 2026年1月12日

摘要

目的: 分析粘连性腹内疝患者术中及术后总体并发症的发生情况及危险因素, 重点探讨发病至手术时间对并发症的影响, 为临床手术时机选择提供参考。方法: 回顾性收集本院经手术证实的粘连性腹内疝患者临床资料, 共64例。根据自觉症状出现至手术时间将患者分为3组: a组(≤ 1 d, 20例)、b组(1 d $<$ 时间 ≤ 3 d, 13例)、c组(> 3 d, 31例)。将术中肠缺血、肠穿孔、肠切除以及术后3个月内并发症(如切口感染、腹腔感染、梗阻复发等)合并定义为“总体并发症”, 比较不同发病时间组间并发症发生情况及相关临床特征。以总体并发症为因变量, 纳入年龄、体重指数(body mass index, BMI)、白细胞计数(white blood cell, WBC)、C反应蛋白(C-reactive protein, CRP)、白蛋白(albumin, ALB)、肌酐(creatinine, CR)、术前影像学特征(闭袢征象、肠壁水肿、腹水)、既往腹部手术史、既往小肠梗阻史、合并基础疾病及发病时间分组等具有临床意义且单因素分析 $P < 0.10$ 的变量, 采用多因素Logistic回归模型分析总体并发症的独立危险因素。结果: 64例患者中, 总体并发症发生32例(50.0%)。a、b、c组三组总体并发症发生率分别为30.0% (6/20)、69.2% (9/13)、54.8% (17/31), 差异有统计学意义($\chi^2 = 6.62, P = 0.036$)。其中肠缺血26例(40.6%)、肠切除26例(40.6%)、肠穿孔2例(3.1%), 术后3个月内并发症8例(12.5%)。多因素Logistic回归分析结果显示, 在校正年龄、BMI、WBC、CRP、ALB、CR、术前影像学特征、既往腹部手术史、既往小肠梗阻史及合并基础疾病后, 与发病时间 ≤ 1 d的a组相比, b组($1 \sim 3$ d)总体并发症风险显著增加(OR = 11.58, 95%CI 1.56~86.00, $P = 0.017$), c组(> 3 d)总体并发症风险亦显著升高(OR = 5.56, 95%CI 1.01~30.54, $P = 0.048$); 既往小肠梗阻史(OR = 7.73, 95%CI 0.71~83.83, $P = 0.093$)及合并基础疾病(OR = 5.26, 95%CI 0.86~32.02, $P = 0.072$)与总体并发症呈正相关趋势, 但差异未达统计学意义。结论: 粘连性腹内疝患者总体并发症发生率较高, 手术时机延长是影响手术并发症的独立危险因素, 发病时间超过24 h明显增加术中及术后总体并发症风险。对于临床高度怀疑粘连性腹内疝且存在肠缺血高危因素的患者, 应在积极短期非手术治疗评估基础上尽早手术干预, 避免发病时间延长, 可能有助于降低并发症发生率和改善预后。

关键词

粘连性腹内疝, 小肠梗阻, 并发症, 危险因素, 手术时机

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Risk Factors for Surgical Complications in Patients with Adhesive Internal Hernia

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Received: December 7, 2025; accepted: January 1, 2026; published: January 12, 2026

Abstract

Objective: This paper aims to analyze the incidence and risk factors of overall intraoperative and postoperative complications in patients with adhesive internal hernia, with a particular focus on the impact of the interval from symptom onset to surgery, so as to provide evidence for optimization of surgical timing. **Methods:** Clinical data of 64 patients with adhesive internal hernia confirmed by surgery in our hospital were retrospectively collected. According to the time from symptom onset to operation, patients were divided into three groups: group a (≤ 1 day, $n = 20$), group b ($1 < \text{time} \leq 3$ days, $n = 13$), and group c (> 3 days, $n = 31$). Intraoperative bowel ischemia, bowel perforation, bowel resection, and postoperative complications within 3 months (including wound infection, intra-abdominal infection, and recurrent obstruction) were combined and defined as “overall complications”. The incidence of overall complications and related clinical characteristics were compared among the three groups. Overall complications were used as the dependent variable. Age, body mass index (BMI), white blood cell count (WBC), C-reactive protein (CRP), albumin (ALB), creatinine (CR), preoperative imaging features (closed-loop sign, bowel wall edema, ascites), history of abdominal surgery, history of small bowel obstruction, underlying diseases, and onset-to-surgery groups, which were clinically relevant and had $P < 0.10$ in univariate analyses, were entered into a multivariate logistic regression model to identify independent risk factors. **Results:** Overall complications occurred in 32 of the 64 patients (50.0%). The incidence of overall complications in groups a, b, and c was 30.0% (6/20), 69.2% (9/13), and 54.8% (17/31), respectively ($\chi^2 = 6.62$, $P = 0.036$). Bowel ischemia and bowel resection were observed in 26 patients each (40.6%), bowel perforation in 2 (3.1%), and postoperative complications within 3 months in 8 (12.5%). Multivariate logistic regression showed that, after adjustment for age, BMI, WBC, CRP, ALB, CR, preoperative imaging features, previous abdominal surgery, history of small bowel obstruction, and underlying diseases, patients in group b ($1 < \text{time} \leq 3$ days) had a significantly higher risk of overall complications than those in group a (≤ 1 day) (OR = 11.58, 95%CI: 1.56–86.00, $P = 0.017$), and patients in group c (> 3 days) also had an increased risk (OR = 5.56, 95%CI: 1.01–30.54, $P = 0.048$). A history of small bowel obstruction (OR = 7.73, 95%CI: 0.71–83.83, $P = 0.093$) and underlying diseases (OR = 5.26, 95%CI: 0.86–32.02, $P = 0.072$) showed a positive association with overall complications but did not reach statistical significance. **Conclusions:** Patients with adhesive internal hernia have a high incidence of overall complications, and delayed surgical timing is an independent risk factor for perioperative complications. A symptom onset-to-surgery interval exceeding 24 hours markedly increases the risk of overall intraoperative and postoperative complications. For patients with a strong clinical suspicion of adhesive internal hernia and high-risk features for bowel ischemia, early surgical intervention after a short period of careful non-operative assessment is recommended to avoid prolonged symptom duration, which may help reduce the incidence of complications and improve prognosis.

Keywords

Adhesive Internal Hernia, Small Bowel Obstruction, Complications, Risk Factors, Surgical Timing



1. 引言

粘连性小肠梗阻(adhesive small bowel obstruction, ASBO)是常见的急腹症,粘连性腹内疝(adhesive internal hernia)是粘连性小肠梗阻中的特殊类型,肠管通过粘连形成的间隙或窦道发生嵌顿和绞窄,虽然在全部肠梗阻患者中比例不高,但一旦发生绞窄及肠坏死,病情进展迅速,病死率较高[1]-[4]。随着腹腔镜及多次开腹手术的广泛开展,术后腹腔粘连日益成为腹内疝的重要病因之一,由此形成的粘连性腹内疝往往起病隐匿、影像学表现复杂,临床早期识别困难[3] [5]-[7]。

既往大量研究证实,粘连性小肠梗阻的手术时机与肠缺血、肠切除以及死亡风险密切相关[6]-[13]。世界急诊外科学会(WSES)发布的 Bologna 指南及后续研究提出,在无肠缺血或穿孔征象时,可短期非手术治疗,但若保守治疗失败或延迟手术超过一定时间,肠切除率和并发症将明显增加[1]-[3] [8] [9]。然而,针对粘连性腹内疝这一特殊病理类型,目前国内外报道较少,既往研究多将其归入“粘连性小肠梗阻”范畴统一分析[3] [8] [14]-[16],关于粘连性腹内疝的研究仍缺乏。

本研究回顾分析本院 64 例经手术证实的粘连性腹内疝患者,按症状起病至手术时间分组,将术中肠缺血、肠穿孔、肠切除以及术后 3 个月内并发症合并为“总体并发症”进行分析,旨在明确发病时间对总体并发症的影响,并探讨相关危险因素,为临床制定更为合理的手术时机和围手术期管理策略提供参考。

2. 研究对象和方法

2.1. 研究对象

回顾性分析 2020 年 1 月至 2024 年 9 月青岛大学附属医院急诊外科收治的粘连性腹内疝手术患者,共纳入 64 例。所有患者均经术中所见证实存在粘连形成的窦道或间隙,小肠嵌顿或扭转,符合粘连性腹内疝诊断;排除开放性腹部外伤所致内疝、腹膜后疝、先天性旁十二指肠疝等非粘连性内疝,以及术前资料严重缺失者。

2.2. 分组方法

根据首次出现腹痛、呕吐、停止排气排便等小肠梗阻症状至实施手术的时间分为:

a 组: $T \leq 1 \text{ d}$ (20 例);

b 组: $1 \text{ d} < T \leq 3 \text{ d}$ (13 例);

c 组: $T > 3 \text{ d}$ (31 例)。

2.3. 观测指标

(1) 一般资料:性别、年龄、BMI(体重/身高²)、吸烟史、饮酒史、既往腹部手术史、既往小肠梗阻史、其他腹腔腔疾病史及合并基础疾病(高血压、糖尿病、冠心病、慢性肾病等)。

(2) 实验室及围手术期指标:术前 WBC、CRP、ALB、CR 等,术前影像特征,总住院日、术后住院日、住院费用、术后首次排气时间等,具体取值以入院或术前最近一次实验室检查结果为准。

(3) 术中与术后并发症:术中记录是否存在肠缺血(小肠色泽暗紫、浆膜下出血、肠系膜血流受限等)、

肠穿孔及是否行肠切除；术后 3 个月内根据门诊或再入院记录，判断是否发生切口感染、腹腔感染、梗阻复发需再入院或再手术等并发症。

(4) 总体并发症(Overall complication)：若上述四类事件中任一发生，则定义为“有总体并发症”(记为 1)，否则为“无总体并发症”(记为 0)。

2.4. 统计学方法

采用 SPSS 26.0 软件进行统计分析。连续型资料行正态性检验，符合正态分布者以($\bar{x} \pm s$)表示，组间比较采用单因素方差分析；不符合正态分布者以中位数(四分位数)表示，组间比较采用 Kruskal–Wallis H 检验。分类资料以例数和百分比表示，组间比较采用 χ^2 检验或 Fisher 精确检验。

以总体并发症(0 = 否, 1 = 是)为因变量，先进行单因素分析筛选与总体并发症有关的候选变量，再结合临床意义，将年龄、BMI、WBC、CRP、ALB、CR、影像学特征、既往腹部手术史、既往小肠梗阻史、合并基础疾病及发病时间分组纳入多因素 Logistic 回归模型，计算比值比(odds ratio, OR)及其 95%置信区间(95%CI)。双侧 $P < 0.05$ 为差异具有统计学意义。

3. 结果

3.1. 一般临床特征

64 例患者中，男性 31 例(48.4%)，女性 33 例(51.6%)；年龄(58.2 ± 12.3)岁；BMI 中位数为 23.0 (20.3, 24.0) kg/m²。a、b、c 三组在性别构成、年龄、BMI、吸烟与饮酒史、既往腹部手术史、既往小肠梗阻史及合并基础疾病等方面差异均无统计学意义(均 $P > 0.05$)，提示三组基线人口学资料总体平衡。

术前实验室指标方面，三组术前白细胞、白蛋白水平差异有统计学意义，而 C 反应蛋白、肌酐总体水平相近，部分指标在单因素分析中差异接近统计学意义，但未见明显系统性偏倚。总住院日和术后住院日三组间差异亦无统计学意义。术前影像学特征也均无统计学差异。

3.2. 术中及术后并发症情况

全组患者中，肠缺血 26 例(40.6%)、肠切除 26 例(40.6%)、肠穿孔 2 例(3.1%)，术后 3 个月内并发症 8 例(12.5%)。按总体并发症定义，共 32 例发生总体并发症，总发生率为 50.0%。

按发病时间分组来看，a、b、c 三组总体并发症发生率分别为 30.0% (6/20)、69.2% (9/13)和 54.8% (17/31)，组间差异有统计学意义($\chi^2 = 6.62, P = 0.036$)。b 组总体并发症发生率最高，其次为 c 组，a 组最低。既往小肠梗阻史患者共 7 例，其中 6 例发生总体并发症(85.7%, 6/7)，无小肠梗阻史者总体并发症发生率为 45.6% (26/57)，单因素分析差异接近统计学意义。结果见表 1。

Table 1. Basic characteristics and comparative analysis
表 1. 基本特征与差异性分析

临床特征	总数(n = 64)	a 组(n = 20)	b 组(n = 13)	c 组(n = 31)	P
性别, n (%)					0.122
男	31 (48.44)	11 (55.00)	3 (23.08)	17 (54.84)	
女	33 (51.56)	9 (45.00)	10 (76.92)	14 (45.16)	
年龄(岁)	58.00 (50.00, 67.00)	58.50 (51.75, 65.75)	57.00 (49.00, 62.00)	60.00 (50.50, 67.00)	0.738
BMI (Kg/m ²)	23.00 (20.28, 24.00)	23.00 (21.55, 23.33)	23.00 (20.20, 24.00)	22.50 (20.15, 24.90)	0.952

续表

吸烟史, n (%)	7 (10.94)	2 (10.00)	0 (0.00)	5 (16.13)	0.386
饮酒史, n (%)	8 (12.50)	3 (15.00)	0 (0.00)	5 (16.13)	0.425
腹部手术史, n (%)	38 (59.38)	10 (50.00)	8 (61.54)	20 (64.52)	0.579
小肠梗阻史, n (%)	7 (11.11)	0 (0.00)	3 (23.08)	4 (13.33)	0.091
腹部及盆腔疾病史, n (%)	1 (1.56)	0 (0.00)	1 (7.69)	0 (0.00)	0.233
基础疾病, n (%)	20 (31.25)	9 (45.00)	3 (23.08)	8 (25.81)	0.274
手术方式, n (%)					0.579
开腹	38 (59.38)	10 (50.00)	8 (61.54)	20 (64.52)	
腹腔镜	26 (40.62)	4 (20.00)	8 (61.54)	14 (45.16)	
肠缺血, n (%)	26 (40.62)	4 (20.00)	8 (61.54)	14 (45.16)	0.046
肠穿孔, n (%)	2 (3.12)	1 (5.00)	0 (0.00)	1 (3.23)	1.000
肠切除, n (%)	26 (40.62)	4 (20.00)	8 (61.54)	14 (45.16)	0.046
术后 3 月再入院, n (%)	4 (6.25)	0 (0.00)	1 (7.69)	3 (9.68)	0.409
术后 3 月并发症, n (%)	8 (12.50)	0 (0.00)	1 (7.69)	7 (22.58)	0.038
术后 3 月再手术, n (%)	2 (3.12)	0 (0.00)	0 (0.00)	2 (6.45)	0.692
白细胞($10^9/L$)	12.31 (9.78, 14.37)	7.30 (4.85, 8.36)	6.91 (5.52, 8.60)	12.31 (9.78, 14.37)	0.003
C-反应蛋白(mg/L)	4.58 (0.57, 16.83)	14.67 (8.15, 36.87)	11.50 (3.77, 23.65)	4.58 (0.57, 16.83)	0.114
白蛋白(g/L)	42.35 (38.48, 44.82)	34.20 (33.10, 38.70)	38.00 (34.40, 44.15)	42.35 (38.48, 44.82)	0.034
肌酐($\mu\text{mol/L}$)	59.61 (45.16, 79.71)	54.00 (41.00, 69.00)	62.40 (47.60, 78.10)	59.61 (45.16, 79.71)	0.547
C-或 U-型肠袢, n (%)	1 (1.56)	0 (0.00)	1 (7.69)	0 (0.00)	0.233
腹水, n (%)	38 (59.38)	10 (50.00)	8 (61.54)	20 (64.52)	0.579
肠壁水肿, n (%)	38 (59.38)	10 (50.00)	8 (61.54)	20 (64.52)	0.579
总住院时间(天)	9.00 (7.00, 13.00)	9.00 (6.75, 11.25)	10.00 (8.00, 13.00)	9.00 (7.00, 16.50)	0.611
术后住院时间(天)	7.00 (5.00, 10.00)	7.00 (5.00, 9.25)	7.00 (6.00, 11.00)	7.00 (5.00, 13.50)	0.904
住院费用(元)	31579.33 (23500.44, 47337.77)	33076.32 (26683.96, 47684.32)	33804.73 (24096.88, 47082.99)	30030.38 (21826.86, 44994.48)	0.886
术后首次排气排便时间(天)	4.00 (3.00, 5.00)	4.00 (3.00, 4.25)	4.00 (3.00, 5.00)	4.00 (3.00, 5.00)	0.592

3.3. 总体并发症的多因素 Logistic 回归分析

以总体并发症是否发生为因变量, 将年龄、BMI、WBC、CRP、ALB、CR、术前影像特征、既往腹部手术史、既往小肠梗阻史、合并基础疾病及发病时间分组(纳入多因素 Logistic 回归模型。结果见表 2。发病时间 1~3 d 的 b 组总体并发症风险较 a 组显著升高($OR = 11.58$, $95\%CI$ 1.56~86.00, $P = 0.017$), 发病时间 > 3 d 的 c 组总体并发症风险亦明显增加($OR = 5.56$, $95\%CI$ 1.01~30.54, $P = 0.048$), 均为总体并发症的独立危险因素。既往小肠梗阻史($OR = 7.73$, $95\%CI$ 0.71~83.83, $P = 0.093$)及合并基础疾病($OR = 5.26$, $95\%CI$ 0.86~32.02, $P = 0.072$)与总体并发症呈正相关趋势, 但差异未达统计学意义。年龄、BMI、WBC、CRP、ALB、CR、术前影像特征和既往腹部手术史与总体并发症未见显著关联(均 $P > 0.05$)。

Table 2. Multivariate logistic regression analysis
表 2. 多因素 Logistic 回归分析结果

变量	OR 值	95%可信区间	P
白细胞	1.11	0.94~1.32	0.221
白蛋白	1.02	0.90~1.16	0.711
小肠梗阻史	7.73	0.71~83.83	0.093
发病时间 1~3 d	11.58	1.56~86.00	0.017
发病时间 > 3 d	5.56	1.01~30.54	0.048

4. 讨论

4.1. 主要研究结果

本研究以粘连性腹内疝患者为研究对象，将术中肠缺血、肠穿孔、肠切除以及术后 3 个月内并发症合并为“总体并发症”，发现总体并发症发生率高达 50.0%，提示此类患者围手术期风险较高。多因素 Logistic 回归结果显示，在校正年龄、BMI、WBC、CRP、ALB、CR、术前影像特征、既往腹部手术史、既往小肠梗阻史及合并基础疾病等因素后，发病时间 1~3 d 和>3 d 均显著增加总体并发症发生风险，其中 b 组(1~3 d) OR 值最高，达 11.58。这表明，发病至手术时间延长是粘连性腹内疝总体并发症的独立危险因素。

既往小肠梗阻史及合并基础疾病在本研究中虽未达到统计学显著，但 OR 值均大于 1，呈现出一定危险趋势，提示此类患者在再次发生腹内疝时可能更易出现肠缺血、肠坏死及术后并发症。

4.2. 发病时间与肠缺血、肠切除的关系

大量研究表明，粘连性小肠梗阻患者延迟手术与肠缺血、肠切除以及死亡风险升高密切相关[6]-[13]。WSES Bologna 指南建议，对于无肠缺血征象的患者可给予短期非手术治疗，但若症状持续或影像学提示绞窄征象，应及时手术[1]-[3]。Lee 等多中心前瞻性队列研究亦发现，手术延迟、营养不良及急性肾损伤是急性小肠梗阻不良预后重要危险因素[7] [17] [18]；Schraufnager 等利用 Nationwide Inpatient Sample 数据库分析指出，随着“日落”次数增加(即症状持续时间延长)，手术率、肠切除率及病死率均明显升高[9]。

本研究结果与上述研究一致：发病时间 1~3 d 与>3 d 患者总体并发症风险分别较 ≤1 d 显著升高 11.58 倍和 5.56 倍。值得注意的是，b 组 OR 值略高于 c 组，可能与样本量有限、基线差异及“幸存者偏倚”等因素相关：部分病情凶险、进展迅速的患者在早期手术中“被截获”，而能“拖到”3 d 以上的患者中，可能存在症状较缓和或反复缓解的个体。此外，部分患者起病时间依赖病史回忆，可能存在一定信息偏倚。

总体而言，本研究提示，在粘连性腹内疝患者中，发病后 1~3 d 是并发症风险明显累积的“危险窗口期”，延迟手术可能使肠系膜血供进一步受限，增加肠缺血、肠切除及术后感染等并发症风险。

4.3. 既往小肠梗阻史及基础疾病的潜在影响

既往小肠梗阻史提示腹腔粘连程度较重和肠管储备较差，多次梗阻发作可能导致肠壁慢性损害，更易在再次梗阻时发生绞窄和坏死[14]-[16]。本研究中，有既往小肠梗阻史患者总体并发症 OR 值约为 7.73，虽未达统计学显著，但置信区间上限较高，提示其对并发症发生可能具有一定放大效应。

合并基础疾病(如心脑血管疾病、糖尿病、慢性肾病等)的患者围手术期并发症风险往往更高[19] [20]。本研究发现，合并基础疾病的患者总体并发症风险呈升高趋势(OR = 5.26)，但受制于样本量，差异未达到统计学意义，这也提示未来需在更大样本中进一步验证。

WBC、CRP、ALB 与 CR 等指标反映了炎症反应、营养及肾功能状态,既往文献报道其与肠缺血、感染及预后相关[15][16][19],但在本研究多因素模型中均未成为独立预测因子,可能与样本量较小、检测时间点不完全统一以及变量共线性等因素有关。

4.4. 临床启示

本研究对临床实践的启示主要包括:(1)对于影像学提示粘连性腹内疝并伴有明显腹痛、持续性高 WBC、CRP 升高或血流动力学不稳定的患者,应避免延长保守观察时间,尤其发病 24 h 后症状未缓解者,更应高度警惕绞窄和肠缺血的可能;(2)既往多次小肠梗阻发作或合并多种基础疾病的患者属高危人群,应更早纳入外科评估决策;(3)在遵循 Bologna 指南的基础上,结合 CT 征象(闭袢征象、肠壁强化减弱、腹水等)和实验室指标,有望进一步细化粘连性腹内疝的风险分层与手术时机选择[8][12][15][16][21][22]。

总之,对于粘连性腹内疝这一较为凶险的特殊类型,仅机械套用“一般粘连性小肠梗阻可观察 48~72 h”的经验并不安全,应在循证基础上适当“左移”手术时机。

4.5. 研究局限与展望

本研究为单中心回顾性研究,样本量有限,部分变量(如既往小肠梗阻史、合并基础疾病)置信区间较宽,增加了估计的不确定性;另一方面,本研究仅纳入行手术治疗的患者,未对成功保守治疗的粘连性腹内疝患者进行横向比较,存在选择偏倚。其次,本研究因样本量较小原因,CT 征象(闭袢征象、肠壁水肿、腹水)及手术方式均无统计学意义,而这些因素在既往研究中被证实与预后相关[9]-[13][19][23]。

未来可在多中心基础上扩大样本量,综合临床、实验室及影像学变量,构建针对粘连性腹内疝的风险预测模型,探索以发病时间、影像学征象及炎症指标为核心的手术决策流程,从而进一步优化治疗策略、降低并发症发生率。

5. 结论

粘连性腹内疝患者总体并发症发生率较高。手术时机延长是术中及术后总体并发症发生的独立危险因素,提示延迟手术会显著增加肠缺血、肠切除及术后感染等并发症风险。临床实践中,对于高度怀疑粘连性腹内疝的患者,应重视发病时间这一简单而重要的风险信号,在充分评估基础上尽早手术干预,以降低肠缺血、肠切除及术后并发症的发生,改善患者预后。

声 明

本研究获得青岛大学附属医院医学伦理委员会批准(审批号:QYFYWZLL29206)。

参考文献

- [1] Ten Broek, R.P.G., Krielen, P., Di Saverio, S., *et al.* (2018) Bologna Guidelines for Diagnosis and Management of Adhesive Small Bowel Obstruction (ASBO): 2017 Update of the Evidence-Based Guidelines from the World Society of Emergency Surgery ASBO Working Group. *World Journal of Emergency Surgery*, **13**, Article No. 24.
- [2] Catena, F., De Simone, B., Coccolini, F., Di Saverio, S., Sartelli, M. and Ansaloni, L. (2019) Bowel Obstruction: A Narrative Review for All Physicians. *World Journal of Emergency Surgery*, **14**, Article No. 20. <https://doi.org/10.1186/s13017-019-0240-7>
- [3] Tong, J.W.V., Lingam, P. and Shelat, V.G. (2020) Adhesive Small Bowel Obstruction—An Update. *Acute Medicine & Surgery*, **7**, e587. <https://doi.org/10.1002/ams2.587>
- [4] Ghimire, P., Thway, A.M., Pangeni, A., *et al.* (2023) Adhesive Small Bowel Obstruction: A Review. *International Journal of Surgery*, **104**, Article ID: 106828.
- [5] Svanes Fevang, B., Fevang, J., Atle Lie, S., Søreide, O., Svanes, K. and Viste, A. (2004) Long-Term Prognosis after

- Operation for Adhesive Small Bowel Obstruction. *Annals of Surgery*, **240**, 193-201. <https://doi.org/10.1097/01.sla.0000132988.50122.de>
- [6] Miller, G., Boman, J., Shrier, I. and Gordon, P.H. (2000) Small-Bowel Obstruction: A Review of 465 Cases. *The American Journal of Surgery*, **180**, 123-127.
 - [7] Lee, M.J., Sayers, A.E., Drake, T.M., Marriott, P.J., Anderson, I.D., Bach, S.P., *et al.* (2019) National Prospective Cohort Study of the Burden of Acute Small Bowel Obstruction. *BJS Open*, **3**, 354-366. <https://doi.org/10.1002/bjs5.50136>
 - [8] Lee, M.J., Sayers, A.E., Drake, T.M., Singh, P., Bradburn, M., Wilson, T.R., *et al.* (2019) Malnutrition, Nutritional Interventions and Clinical Outcomes of Patients with Acute Small Bowel Obstruction: Results from a National, Multi-centre, Prospective Audit. *BMJ Open*, **9**, e029235. <https://doi.org/10.1136/bmjopen-2019-029235>
 - [9] Schraufnagel, D., Rajaei, S. and Millham, F.H. (2013) How Many Sunsets? Timing of Surgery in Adhesive Small Bowel Obstruction: A Study of the Nationwide Inpatient Sample. *Journal of Trauma and Acute Care Surgery*, **74**, 181-189. <https://doi.org/10.1097/ta.0b013e31827891a1>
 - [10] Thornblade, L.W., Verdial, F.C., Bartek, M.A., Flum, D.R. and Davidson, G.H. (2019) The Safety of Expectant Management for Adhesive Small Bowel Obstruction: A Systematic Review. *Journal of Gastrointestinal Surgery*, **23**, 846-859. <https://doi.org/10.1007/s11605-018-4017-1>
 - [11] Hajibandeh, S., Hajibandeh, S., Panda, N., Khan, R.M.A., Bandyopadhyay, S.K., Dalmia, S., *et al.* (2017) Operative versus Non-Operative Management of Adhesive Small Bowel Obstruction: A Systematic Review and Meta-Analysis. *International Journal of Surgery*, **45**, 58-66. <https://doi.org/10.1016/j.ijsu.2017.07.073>
 - [12] Ceresoli, M., Coccolini, F., Catena, F., Montori, G., Di Saverio, S., Sartelli, M., *et al.* (2016) Water-Soluble Contrast Agent in Adhesive Small Bowel Obstruction: A Systematic Review and Meta-Analysis of Diagnostic and Therapeutic Value. *The American Journal of Surgery*, **211**, 1114-1125. <https://doi.org/10.1016/j.amjsurg.2015.06.012>
 - [13] Keenan, J.E., Turley, R.S., McCoy, C.C., Migaly, J., Shapiro, M.L. and Scarborough, J.E. (2014) Trials of Nonoperative Management Exceeding 3 Days Are Associated with Increased Morbidity in Patients Undergoing Surgery for Uncomplicated Adhesive Small Bowel Obstruction. *Journal of Trauma and Acute Care Surgery*, **76**, 1367-1372. <https://doi.org/10.1097/ta.0000000000000246>
 - [14] Mu, J., Wang, Q., Wang, S., Wang, C., Song, J., Jiang, J., *et al.* (2018) Clinical Factors Associated with Intestinal Strangulating Obstruction and Recurrence in Adhesive Small Bowel Obstruction. *Medicine*, **97**, e12011. <https://doi.org/10.1097/md.00000000000012011>
 - [15] Millet, I., Ruyer, A., Alili, C., Curros Doyon, F., Molinari, N., Pages, E., *et al.* (2014) Adhesive Small-Bowel Obstruction: Value of CT in Identifying Findings Associated with the Effectiveness of Nonsurgical Treatment. *Radiology*, **273**, 425-432. <https://doi.org/10.1148/radiol.14132872>
 - [16] Millet, I., Taourel, P., Ruyer, A. and Molinari, N. (2015) Value of CT Findings to Predict Surgical Ischemia in Small Bowel Obstruction: A Systematic Review and Meta-Analysis. *European Radiology*, **25**, 1823-1835. <https://doi.org/10.1007/s00330-014-3440-2>
 - [17] Abera, S.A., Adem, A.A., Endawkie, A., Ahmed, A.N. and Mohammed, S. (2025) Success Rate and Associated Factors of Conservative Management of Adhesive Small Bowel Obstruction at Dessie Comprehensive Specialized Hospital, Northeast Ethiopia. *Scientific Reports*, **15**, Article No. 36570. <https://doi.org/10.1038/s41598-025-20288-z>
 - [18] Matsushima, K., Sabour, A., Park, C., Strumwasser, A., Inaba, K. and Demetriades, D. (2019) Management of Adhesive Small Bowel Obstruction: A Distinct Paradigm Shift in the United States. *Journal of Trauma and Acute Care Surgery*, **86**, 383-391. <https://doi.org/10.1097/ta.00000000000002150>
 - [19] Guerrini, J., Zugna, D., Poretti, D., Samà, L., Costa, G., Mei, S., *et al.* (2021) Adhesive Small Bowel Obstruction: Single Band or Matted Adhesions? a Predictive Model Based on Computed Tomography Scan. *Journal of Trauma and Acute Care Surgery*, **90**, 917-923. <https://doi.org/10.1097/ta.00000000000003182>
 - [20] Essani, R. and Bergamaschi, R. (2008) Laparoscopic Management of Adhesive Small Bowel Obstruction. *Techniques in Coloproctology*, **12**, 283-287. <https://doi.org/10.1007/s10151-008-0436-4>
 - [21] Gu, L., Zhu, F., Xie, T., Feng, D., Gong, J. and Li, N. (2021) Use of the Water-Soluble Contrast Medium Gastrografin in Treatment of Adhesive Small Bowel Obstruction in Patients with and without Chronic Radiation Enteropathy: A Single-Center Retrospective Study. *Medical Science Monitor*, **27**, e930046. <https://doi.org/10.12659/msm.930046>
 - [22] Krielen, P., van den Beukel, B.A., Stommel, M.W.J., van Goor, H., Strik, C. and ten Broek, R.P.G. (2016) In-Hospital Costs of an Admission for Adhesive Small Bowel Obstruction. *World Journal of Emergency Surgery*, **11**, Article No. 49. <https://doi.org/10.1186/s13017-016-0109-y>
 - [23] Rehman, S., Baho, Y., Thakur, A. and Farinella, E. (2024) Streamlining the Non-Operative Management of Adhesive Small Bowel Obstruction: A Closed-Loop Audit Evaluating the Introduction of a Standardised Gastrografin Protocol in a District General Hospital. *Cureus*, **16**, e73327. <https://doi.org/10.7759/cureus.73327>