Advances in Clinical Medicine 临床医学进展, 2025, 15(5), 2730-2736
Published Online May 2025 in Hans. https://www.hanspub.org/journal/acm
https://doi.org/10.12677/acm.2025.1551671

Hans汉斯

既往腹部手术对腹腔镜根治性手术胃癌患者短期结局的影响

屈书培*，赵俊男，王春毅#

重庆医科大学附属第一医院胃肠外科，重庆

收稿日期：2025年4月28日；录用日期：2025年5月21日；发布日期：2025年5月31日

摘　要

本文就既往腹部手术史(PAS)与腹腔镜胃癌(GC)手术后并发症相关性、短期结局以及当前治疗策略和研究进展进行总结。关于PSA和GC术后并发症的相关性，研究表明PAS不是影响术后并发症的独立危险因素。关于GC术后短期结局，大多数研究认为PAS组与非PAS组在术后短期结局(手术时间、出血量、术后住院时间及术后并发症)方面无显著差异，然而，也有研究指出，相较于非PAS组，PAS组的患者手术时间更长，且术后并发症发生率更高。尽管如此，经验丰富的外科医生通过在术前精准评估病情、术中熟练运用腹腔镜器械进行精细操作，以及术后合理使用防粘连材料，仍能够让PAS患者获得与无PAS患者相当的短期疗效。关于当前的治疗策略和研究进展，我们应在治疗的每个阶段采取更系统化、针对性的策略，以最大程度降低PSA对腹腔镜GC手术的影响，提高手术的安全性与可行性。

关键词

胃癌，既往腹部手术史，腹腔镜根治性手术，术后短期结局

The Impact of Previous Abdominal Surgery on Short-Term Outcomes of Gastric Cancer Patients Undergoing Laparoscopic Radical Surgery

Shupei Qu*, Junnan Zhao, Chunyi Wang#

Department of Gastrointestinal Surgery, The First Affiliated Hospital of Chongqing Medical University, Chongqing

Received: Apr. 28th, 2025; accepted: May 21st, 2025; published: May 31st, 2025

*第一作者。
#通讯作者。

文章引用: 屈书培, 赵俊男, 王春毅. 既往腹部手术对腹腔镜根治性手术胃癌患者短期结局的影响[J]. 临床医学进展, 2025, 15(5): 2730-2736. DOI: 10.12677/acm.2025.1551671

Abstract

This paper summarizes the correlation between a history of previous abdominal surgery (PAS) and postoperative complications of gastric cancer (GC) surgery, short-term outcomes, as well as current treatment strategies and research progress. Regarding the association between PAS and postoperative complications of GC surgery, studies have shown that PSA is not an independent risk factor for postoperative complications. In terms of short-term outcomes after GC surgery, most studies suggest that there are no significant differences between the PAS and non-PAS groups in operation time, bleeding volume, postoperative hospital stay, and postoperative complications. However, some studies have reported that, compared to the non-PAS group, patients in the PAS group tend to have longer operation times and a higher incidence of postoperative complications. Nevertheless, experienced surgeons can still help PAS patients achieve short-term outcomes comparable to those of non-PAS patients through precise preoperative assessment, skilled laparoscopic techniques, and the appropriate use of anti-adhesion materials postoperatively. Regarding current treatment strategies and research progress, a more systematic and targeted approach should be adopted at each stage of treatment to minimize the impact of PSA on laparoscopic GC surgery and enhance both the safety and feasibility of the procedure.

Keywords

Gastric Cancer, History of Previous Abdominal Surgery, Laparoscopic Radical Surgery, Short-Term Outcomes

1. 背景

胃癌(GC)是一种常见的恶性肿瘤，全世界每 13 例死亡病例中就有一例死于 GC，是全球癌症相关死亡的第四大原因[1]。当前，手术仍然是胃癌患者的最重要最有效的治疗方式[2] [3]。随着微创外科技术的发展，腹腔镜根治性手术已逐渐成为早期及部分进展期胃癌的标准治疗方式。与开放式手术相比，腹腔镜手术具有创伤小、术后发病率低、胃肠功能恢复较快以及术后住院时间较短等优点[4] [5]。然而，部分患者因既往患有阑尾炎、胆囊结石、肠梗阻、妇科手术等疾病，接受过一次或多次腹部手术，形成不同程度的腹腔粘连。据报道，曾接受过腹部手术(PAS)的患者，其腹腔内粘连率高达 60%至 90%。PAS 引起的腹部粘连往往会增加手术的难度，因此外科医生在进行腹腔镜根治性手术前通常会询问患者的 PAS 病史，以评估手术风险[6]-[8]。尽管目前 PAS 未被纳入腹腔镜胃癌切除术的禁忌症范畴，但仍需关注 PAS 是否会对腹腔镜胃癌手术结果产生不利影响。因此本文将综述 PAS 对腹腔镜根治性手术 GC 患者术后并发症相关性、术后短期结局以及当前的治疗策略和研究进展。

2. 既往腹部手术史(PAS)

PAS 通常指患者曾接受过任何形式的腹部手术，包括但不限于阑尾切除术、胆囊切除术、剖宫产术、肠梗阻手术及肿瘤根治术。有证据表明 PAS 的发生率为 21%~46% [9]-[11]。在患者入院时，询问既往手术史是必不可少的。多项研究证实，PAS 是引起腹腔粘连最主要的原因之一，约 90%以上的腹部手术患者术后可出现不同程度的粘连。腹腔粘连不仅影响术中操作空间，还可能导致重要脏器损伤、手术时间延长。

3. 腹腔粘连

腹部粘连是指在体腔内表面之间形成的包含血管组织的病理性粘连[12]-[15]。腹腔粘连形成是 PAS 的常见并发症[16]，通常由感染、缺血和异物反应引起，据统计，近 90%的患者在腹部手术后出现腹部粘连[17]-[22]。并且粘连发生率随着手术次数的增加而增加[23] [24]。腹膜损伤后的修复过程遵循着精密的生理机制。当腹部手术损伤腹膜引发腹膜炎症时，间皮细胞会通过分裂增殖逐步覆盖创面，同时巨噬细胞生成和纤维蛋白凝胶基质重组。理想情况下，纤维蛋白渗出物在 72 小时内完成降解，5~7 天形成新生基底腹膜，实现解剖结构的生理性修复。然而，当局部微环境失衡时，这一精密的修复程序就会发生病理偏移。手术创伤导致的缺血或感染将会抑制纤维蛋白溶解系统活性，从而无法及时清除纤维蛋白。这些未降解的纤维蛋白在术后 3 日内逐渐构筑起连接暴露组织的“蛋白桥”，成纤维细胞进入纤维蛋白桥并在手术后 3~5 天内释放胶原蛋白。到第 7 天，纤维蛋白桥中形成小血管，最终将暂时性的纤维连接转化为永久性的纤维性粘连[25]。

4. PSA 和 GC 术后并发症的相关性

虽然 PAS 常常导致较高的腹腔粘连发生率和粘连松解率，但目前的研究表明，PAS 与胃癌术后并发症的发生并没有明确的相关性。例如，廖天然等人认为 PAS 会延长手术时间，PAS 组有更高的术后并发症发生率，但进一步分析显示，PAS 并不是影响术后并发症发生率的独立危险因素[26]。此外，杜贻豹等人也发现，PAS 的患者和没有 PAS 的患者在术后并发症发生率上并无显著差异[27]，虽然该结果与其他结论不同，但是该研究同样也发现 PAS 不是胃癌术后并发症的独立危险因素。该结论需谨慎解读，因其未控制 BMI、ASA 分级等混杂因素存在样本量小等问题，未来仍需进一步探讨 PSA 和 GC 术后并发症的相关性。

5. 手术短期结局

5.1. 术中指标

5.1.1. 手术时间

研究表明，腹部粘连是导致手术时间延长的常见原因。腹部手术引发的组织粘连不仅会显著增加术中解剖难度和粘连松解操作频率[28] [29]，还可能阻碍腹腔镜通路的建立，从而形成双重时间延长效应[30]-[32]。在胃癌手术领域，相关回顾性研究显示，既往有腹部手术史的患者接受腹腔镜根治术的平均手术时长较无手术史者长，因为既往腹部手术史增加了手术难度，导致术中粘连松解率增加，这延长了手术时间[26]，然而李坤等人存在不同观点，他们认为既往腹部手术史不会影响腹腔镜胃癌手术的手术时间，虽然既往腹部手术史导致粘连形成，但是经验丰富的外科医生在术中仅分离影响手术的粘连，对不影响原发病灶处理、无临床症状的腹腔粘连不处理，同时先进的腹腔镜器械比如术中超声刀的使用可缩短分离粘连的时间[33]。可见在手术时间方面上该研究仍有争论。因此，PAS 是否会显著延长手术时间仍需通过大样本前瞻性研究进一步验证。

5.1.2. 术中出血时间

腹部粘连是指体腔内壁间形成的异常病理性连接组织，其内部丰富的血管分布显著增加了解剖时的出血风险，尤其在严重粘连情况下若操作不当可能引发意外大出血[34]。然而，针对 PAS 的 GC 患者群体，多项研究证实其术中出血量并未因 PAS 显著增加[35] [36]。这种现象可从两个维度进行解析：首先，外科团队通过术前详细的病史追溯结合影像学评估，可预判粘连范围及血管分布特征，从而制定个体化手术方案；其次，现代腹腔镜技术借助高清成像系统和能量器械的进步，使术者能够在放大视野下实现

精细解剖，有效控制微血管出血。这种系统性的风险防控体系，最终使 PAS 相关患者的术中出血量维持在可控范围。

6. 术后指标

6.1. 术后住院时间

术后住院时间是衡量患者恢复情况的关键因素之一。Vignali 等的研究表明，尽管既往腹部手术史(PAS)会延长腹腔镜手术时间，但患者术后住院时间与无 PAS 组无统计学差异[37]。这一发现与廖天然团队的研究结论高度契合[26]。但也有研究表明 PAS 并不会影响术后住院时间，虽然 PAS 通过增加组织粘连提升手术解剖难度延长手术时间，但在规范实施加速康复外科方案的情况下，PAS 组患者术后住院时长和非 PAS 组的无差异。这种看似矛盾的现象源于腹腔镜技术本身的微创优势——其精准操作可减少组织创伤，同时配合围手术期疼痛管理、早期肠内营养等措施，有效抵消了手术复杂性对康复进程的潜在影响。

6.2. 术后短期并发症

术后并发症的发生率是衡量手术安全性的重要指标。胃癌术后常见的常见并发症包括吻合口漏、肠梗阻、伤口感染、尿路感染、肺炎、腹部感染、胰腺感染、肺部感染等[38]。无规则的粘连可能改变腹腔内的组织解剖结构及位置，导致局部血供改变，从而影响吻合口愈合。此外当肠壁粘附于前腹壁时，不仅增加了肠梗阻的风险，也使得气腹针或套管的插入及组织的暴露分离变得更加困难[39]。有研究表明有 PAS 的胃癌患者的并发症发生率比非 PAS 的患者高[26]，然而，大多数研究表明，PAS 组的胃癌患者和非 PAS 组间的并发症发生率无统计学差异。未来需要更多研究来深入探讨这一现象的具体原因。

7. 治疗策略和研究进展

目前，对于伴有腹腔粘连综合症(PAS)的胃癌(GC)患者，腹腔镜手术已成为主要的治疗方法。患者入院后，外科医生通常会详细询问其 PAS 病史，以评估手术风险，尤其要注意患者上次手术的时间、性质、类型、术后恢复情况及是否存在感染等情况。同时，医生会进行仔细的体格检查，了解原手术切口的瘢痕位置和形状[40]。在手术过程中，外科医生通常会选择合适的穿刺点，并将第一个穿刺点与气腹管连接。第一穿刺点的选择要远离既往腹部手术切口 5 cm 以上，这有助于减少损伤粘连处肠管的风险，并为分离腹腔粘连提供了操作空间和角度。穿刺孔之间应遵循互通原则。同时，气腹通过抬高腹壁、悬挂大网膜和肠道，为腹腔镜手术提供适度的张力，有助于腹部粘连的分离，确保操作安全。在处理粘连时，外科医生通常只会处理那些影响原发病灶的粘连区域。对于需要分离但与腹壁粘连较为严重的区域，外科医生会选择宁愿伤及腹膜而避免损伤肠管。所有操作都在直视下进行，以确保镜下视野清晰。腹腔镜的放大视野有助于外科医生识别血管结构、寻找特定的筋膜间隙并进行精细操作。此外，超声刀的切割精确、止血可靠且能量波及范围小，能够最大限度地避免对周围器官的损伤，这在处理腹腔粘连时具有明显优势[41] [42]。术后，为了减少腹腔粘连的形成，外科医生通常会在伤口、残端及淋巴清扫区域放置防粘连材料，起到物理隔离的作用。研究表明，氧化再生纤维素(ORC)防粘连膜能有效减少腹腔镜和剖腹手术后新发及复发粘连的发生率和范围，降低幅度可达 50%至 60% [43]。凝胶或液体防粘连材料通过促进组织生理修复、抑制疤痕形成、减少组织粘附，甚至还可直接防止新的粘附形成[44] [45]。

8. 结论

既往腹部手术史虽然增加了腹腔镜胃癌根治术的复杂性，但通过术前精准评估、术中精细操作及术后规范管理，PAS 患者仍可获得与无 PAS 患者相当的短期疗效。然而，现有研究多为小样本单中心回顾

性分析，并且缺乏对混杂因素的控制。未来还需开展大样本前瞻性研究，并结合倾向性评分匹配(PSM)进一步探讨 PAS 是否影响接受腹腔镜根治性手术的胃癌患者的术后短期结局，以提供更高质量的循证依据，并为胃癌合并 PAS 患者的个体化手术方案提供可靠的证据。

参考文献

[1] Sung, H., Ferlay, J., Siegel, R.L., Laversanne, M., Soerjomataram, I., Jemal, A., *et al*. (2021) Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries. *CA*: *A Cancer Journal for Clinicians*, **71**, 209-249. https://doi.org/10.3322/caac.21660

[2] Smith, J.K. (2007) National Outcomes after Gastric Resection for Neoplasm. *Archives of Surgery*, **142**, Article 387. https://doi.org/10.1001/archsurg.142.4.387

[3] Qun, Z., Yong, L.I., *et al*. (2013) Comparative Study of Laparoscopic and Open Radical Surgery in Gastric Carcinoma. *Chinese General Practice*, **16**, 210-212.

[4] Mochiki, E., Nakabayashi, T., Kamimura, H., *et al*. (2002) Gastrointestinal Recovery and Outcome after Laparoscopy-Assisted versus Conventional Open Distal Gastrectomy for Early Gastric Cancer. *World Journal of Surgery*, **26**, 1145-1149. https://doi.org/10.1007/s00268-002-6286-8

[5] Liao, G., Wen, S., Xie, X., *et al*. (2016) Laparoscopic Gastrectomy for Remnant Gastric Cancer: Risk Factors Associated with Conversion and a Systematic Analysis of Literature. *International Journal of Surgery*, **34**, 17-22. https://doi.org/10.1016/j.ijsu.2016.08.013

[6] Nozaki, I., Kubo, Y., Kurita, A., *et al*. (2008) Laparoscopic Colectomy for Colorectal Cancer Patients with Previous Abdominal Surgery. *Hepatogastroenterology*, **55**, 943-946.

[7] Hamming, J.F. and Bonsing, B.A. (2013) Adhesiolysis during Abdominal Surgery: Substantial Risks. *Nederlands Tijdschrift voor Geneeskunde*, **157**, A5928.

[8] Lower, A.M., Hawthorn, R.J.S., Emeritus, H.E., O'Brien, F., Buchan, S. and Crowe, A.M. (2000) The Impact of Adhesions on Hospital Readmissions over Ten Years after 8849 Open Gynaecological Operations: An Assessment from the Surgical and Clinical Adhesions Research Study. *BJOG*: *An International Journal of Obstetrics & Gynaecology*, **107**, 855-862. https://doi.org/10.1111/j.1471-0528.2000.tb11083.x

[9] Franko, J., O'Connell, B.G., Mehall, J.R., *et al*. (2006) The Influence of Prior Abdominal Operations on Conversion and Complication Rates in Laparoscopic Colorectal Surgery. *Journal of the Society of Laparoendoscopic Surgeons*, **10**, 169-175.

[10] Offodile, A.C., Lee, S.W., Yoo, J., Whelan, R.L., Moradi, D., Baxter, R., *et al*. (2008) Does Prior Abdominal Surgery Influence Conversion Rates and Outcomes of Laparoscopic Right Colectomy in Patients with Neoplasia? *Diseases of the Colon & Rectum*, **51**, 1669-1674. https://doi.org/10.1007/s10350-008-9278-4

[11] Artinyan, A., Nunoo-Mensah, J.W., Balasubramaniam, S., Gauderman, J., Essani, R., Gonzalez-Ruiz, C., *et al*. (2008) Prolonged Postoperative Ileus—Definition, Risk Factors, and Predictors after Surgery. *World Journal of Surgery*, **32**, 1495-1500. https://doi.org/10.1007/s00268-008-9491-2

[12] Lauder, C.I.W., Garcea, G., Strickland, A. and Maddern, G.J. (2010) Abdominal Adhesion Prevention: Still a Sticky Subject. *Digestive Surgery*, **27**, 347-358. https://doi.org/10.1159/000314805

[13] Beyene, R.T., Kavalukas, S.L. and Barbul, A. (2015) Intra-Abdominal Adhesions: Anatomy, Physiology, Pathophysiology, and Treatment. *Current Problems in Surgery*, **52**, 271-319. https://doi.org/10.1067/j.cpsurg.2015.05.001

[14] Moris, D., Chakedis, J., Rahnemai-Azar, A.A., Wilson, A., Hennessy, M.M., Athanasiou, A., *et al*. (2017) Postoperative Abdominal Adhesions: Clinical Significance and Advances in Prevention and Management. *Journal of Gastrointestinal Surgery*, **21**, 1713-1722. https://doi.org/10.1007/s11605-017-3488-9

[15] Menzies, D. and Ellis, H. (1990) Intestinal Obstruction from Adhesions—How Big Is the Problem? *The Annals of the Royal College of Surgeons of England*, **72**, 60-63.

[16] Levrant, S.G., Bieber, E.J. and Barnes, R.B. (1997) Anterior Abdominal Wall Adhesions after Laparotomy or Laparoscopy. *The Journal of the American Association of Gynecologic Laparoscopists*, **4**, 353-356. https://doi.org/10.1016/s1074-3804(05)80227-0

[17] Ouaïssi, M., Gaujoux, S., Veyrie, N., Denève, E., Brigand, C., Castel, B., *et al*. (2012) Post-Operative Adhesions after Digestive Surgery: Their Incidence and Prevention: Review of the Literature. *Journal of Visceral Surgery*, **149**, e104-e114. https://doi.org/10.1016/j.jviscsurg.2011.11.006

[18] 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

[19] Okabayashi, K., Ashrafian, H., Zacharakis, E., Hasegawa, H., Kitagawa, Y., Athanasiou, T., *et al*. (2013) Adhesions after Abdominal Surgery: A Systematic Review of the Incidence, Distribution and Severity. *Surgery Today*, **44**, 405-420. https://doi.org/10.1007/s00595-013-0591-8

[20] Stommel, M.W.J., ten Broek, R.P.G., Strik, C., Slooter, G.D., Verhoef, C., Grünhagen, D.J., *et al*. (2018) Multicenter Observational Study of Adhesion Formation after Open and Laparoscopic Surgery for Colorectal Cancer. *Annals of Surgery*, **267**, 743-748. https://doi.org/10.1097/sla.0000000000002175

[21] Beyene, R.T., Kavalukas, S.L. and Barbul, A. (2015) Intra-Abdominal Adhesions: Anatomy, Physiology, Pathophysiology, and Treatment. *Current Problems in Surgery*, **52**, 271-319. https://doi.org/10.1067/j.cpsurg.2015.05.001

[22] Holmdahl, L., Eriksson, E., Eriksson, B.I. and Risberg, B. (1998) Depression of Peritoneal Fibrinolysis during Operation Is a Local Response to Trauma. *Surgery*, **123**, 539-544. https://doi.org/10.1067/msy.1998.86984

[23] Weibel, M.-. and Majno, G. (1973) Peritoneal Adhesions and Their Relation to Abdominal Surgery. *The American Journal of Surgery*, **126**, 345-353. https://doi.org/10.1016/s0002-9610(73)80123-0

[24] Trochsler, M. and Maddern, G.J. (2014) Adhesion Barriers for Abdominal Surgery: A Sticky Problem. *The Lancet*, **383**, 8-10. https://doi.org/10.1016/s0140-6736(13)62002-4

[25] Liakakos, T., Thomakos, N., Fine, P.M., Dervenis, C. and Young, R.L. (2001) Peritoneal Adhesions: Etiology, Pathophysiology, and Clinical Significance. *Digestive Surgery*, **18**, 260-273. https://doi.org/10.1159/000050149

[26] Liao, T.R., Huang, C.M., Lin, J.X., *et al*. (2012) Impact of Previous Abdominal Operations on the Outcome of Laparoscopy-Assisted Radical Total Gastrectomy. *Chinese Journal of Gastrointestinal Surgery*, **15**, 960-963.

[27] Du, Y.B., Chen, G.Q., *et al*. (2014) The Effect of Abdominal Surgery History on Laparoscopic Roux-en-Y Gastric Bypass. *Journal of Laparoscopic Surgery*, **19**, 359-362.

[28] Coleman, M.G., McLain, A.D. and Moran, B.J. (2000) Impact of Previous Surgery on Time Taken for Incision and Division of Adhesions during Laparotomy. *Diseases of the Colon & Rectum*, **43**, 1297-1299. https://doi.org/10.1007/bf02237441

[29] Beck, D.E., Ferguson, M.A., Opelka, F.G., Fleshman, J.W., Gervaz, P. and Wexner, S.D. (2000) Effect of Previous Surgery on Abdominal Opening Time. *Diseases of the Colon & Rectum*, **43**, 1749-1753. https://doi.org/10.1007/bf02236862

[30] Ellis, H., Moran, B.J., Thompson, J.N., Parker, M.C., Wilson, M.S., Menzies, D., *et al*. (1999) Adhesion-Related Hospital Readmissions after Abdominal and Pelvic Surgery: A Retrospective Cohort Study. *The Lancet*, **353**, 1476-1480. https://doi.org/10.1016/s0140-6736(98)09337-4

[31] Akyurek, N., Salman, B., Irkorucu, O., *et al*. (2005) Laparoscopic Cholecystectomy in Patients with Previous Abdominal Surgery. *Journal of the Society of Laparoendoscopic Surgeons*, **9**, 178-183.

[32] Major, P., Droś, J., Kacprzyk, A., Pędziwiatr, M., Małczak, P., Wysocki, M., *et al*. (2018) Does Previous Abdominal Surgery Affect the Course and Outcomes of Laparoscopic Bariatric Surgery? *Surgery for Obesity and Related Diseases*, **14**, 997-1004. https://doi.org/10.1016/j.soard.2018.03.025

[33] Li, K., Zhao, L.J., Han, X.P., *et al*. (2014) Feasibility of Laparoscopic Gastrectomy in Patients with a History of Abdominal Surgery. *Chinese Journal of Current Advances in General Surgery*, **17**, 652-654.

[34] Kawamura, H., Yokota, R., Homma, S. and Sato, M. (2009) Acceptability of Laparoscopy-Assisted Gastrectomy for Patients with Previous Intra-Abdominal Surgery. *Surgical Laparoscopy, Endoscopy & Percutaneous Techniques*, **19**, 431-435. https://doi.org/10.1097/sle.0b013e3181c30909

[35] Tsunoda, S., Okabe, H., Obama, K., Tanaka, E., Akagami, M., Kinjo, Y., *et al*. (2013) Laparoscopic Gastrectomy for Patients with a History of Upper Abdominal Surgery: Results of a Matched-Pair Analysis. *Surgery Today*, **44**, 271-276. https://doi.org/10.1007/s00595-013-0533-5

[36] Nunobe, S., Hiki, N., Fukunaga, T., Tokunaga, M., Ohyama, S., Seto, Y., *et al*. (2008) Previous Laparotomy Is Not a Contraindication to Laparoscopy-Assisted Gastrectomy for Early Gastric Cancer. *World Journal of Surgery*, **32**, 1466-1472. https://doi.org/10.1007/s00268-008-9542-8

[37] Vignali, A., Di Palo, S., De Nardi, P., Radaelli, G., Orsenigo, E. and Staudacher, C. (2007) Impact of Previous Abdominal Surgery on the Outcome of Laparoscopic Colectomy: A Case-Matched Control Study. *Techniques in Coloproctology*, **11**, 241-246. https://doi.org/10.1007/s10151-007-0358-6

[38] Goglia, M., Pepe, S., Pace, M., Fattori, L., Minervini, A., Giulitti, D., *et al*. (2023) Complication of Gastric Cancer Surgery: A Single Centre Experience. *In Vivo*, **37**, 2166-2172. https://doi.org/10.21873/invivo.13315

[39] Parsons, J.K., Jarrett, T.J., Chow, G.K. and Kavoussi, L.R. (2002) The Effect of Previous Abdominal Surgery on Urological Laparoscopy. *Journal of Urology*, **168**, 2387-2390. https://doi.org/10.1016/s0022-5347(05)64151-1

[40] Borzellino, G., De Manzoni, G. and Ricci, F. (1998) Detection of Abdominal Adhesions in Laparoscopic Surgery. A

Controlled Study of 130 Cases. *Surgical Laparoscopy Endoscopy & Percutaneous*, **8**, 273-276.

[41] Ota, M., Ikebe, M., Shin, Y., Kagawa, M., Mano, Y., Nakanoko, T., *et al*. (2020) Laparoscopic Total Gastrectomy for Remnant Gastric Cancer: A Single-Institution Experience and Systematic Literature Review. *In Vivo*, **34**, 1987-1992. https://doi.org/10.21873/invivo.11996

[42] Botaitis, S., Simopoulos, C., Karayiannakis, A.J., Polychronidis, A. and Perente, S. (2004) Laparoscopic Cholecystectomy in Patients with Previous Upper or Lower Abdominal Surgery. *Surgical Endoscopy*, **18**, 97-101. https://doi.org/10.1007/s00464-003-9001-4

[43] Lang, J., Ma, D., Xiang, Y., Hua, K., Liu, K., Pan, L., *et al*. (2020) Chinese Expert Consensus on the Prevention of Abdominal Pelvic Adhesions after Gynecological Tumor Surgeries. *Annals of Translational Medicine*, **8**, Article 79. https://doi.org/10.21037/atm.2020.02.53

[44] De Wilde, R.L., Devassy, R., Broek, R.P.G.T., Miller, C.E., Adlan, A., Aquino, P., *et al*. (2022) The Future of Adhesion Prophylaxis Trials in Abdominal Surgery: An Expert Global Consensus. *Journal of Clinical Medicine*, **11**, Article 1476. https://doi.org/10.3390/jcm11061476

[45] Diamond, M.P., Luciano, A., Johns, D.A., Dunn, R., Young, P. and Bieber, E. (2003) Reduction of Postoperative Adhesions by N, O-Carboxymethylchitosan: A Pilot Study. *Fertility and Sterility*, **80**, 631-636. https://doi.org/10.1016/s0015-0282(03)00759-3