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Comparison of clinical outcomes between synthetic mesh abdominal wall reconstruction patients with or without bowel resection

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Abstract

BACKGROUND: Concurrent prosthetic mesh abdominal wall reconstruction during bowel resection remains controversial due to concerns over contamination risks. This study evaluates the safety and efficacy of single-stage mesh repair in bowel resection and compares outcomes between resection and non-resection cohorts. This study evaluates the safety and efficacy of single-stage mesh repair in bowel resection and compares outcomes between resection and non-resection cohorts.

MATERIALS AND METHODS: A retrospective analysis included 79 patients undergoing abdominal wall reconstruction (2018–2023), stratified into bowel resection (n = 22) and non-resection (n = 57) groups. Surgical techniques included open sublay and laparoscopic laparoscopic intraperitoneal onlay mesh plus mesh implantation. Outcomes assessed complication rates, recurrence, and quality of life through Carolinas comfort scale (CCS). Statistical analysis utilized Statistical Package for the Social Sciences 26.0 with $P < 0.05$ as significance threshold.

RESULTS: Operative time and hospitalization were longer in the bowel resection group ($P < 0.05$). No significant differences were observed in overall complication rates (36.36% vs. 36.84%, $P > 0.05$), including mesh infection (4.55% vs. 7.02%), and recurrence (9.09% vs. 8.77%). CCS scores indicated comparable quality of life, with 77.27% of resection and 71.93% of non-resection patients reporting minimal discomfort (scores ≤10).

CONCLUSIONS: Single-stage mesh repair with bowel resection demonstrates safety and efficacy equivalent to non-resection procedures under rigorous infection control. The findings challenge traditional multi-stage approaches, supporting individualized decisions based on contamination severity and patient factors.

Keywords:

Abdominal surgery, abdominal wall hernia, bowel resection, Carolinas Comfort Scale, prosthetic mesh repair, single-stage reconstruction

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Introduction

Surgical treatment for incisional hernia to repair the abdominal wall defect is considered the most effective treatment approach.[1] Inserting a patch at the defect site can notably raise the success rate of abdominal wall reconstruction. Nevertheless, when the hernia gets trapped or strangled, cutting off the dead part of the intestine becomes a necessary action. Traditional belief[2] believes that bowel resection alters the abdominal anatomy and the morphology of the abdominal wall defect,[3] making reconstruction more difficult,[4] while increased postoperative inflammatory response and exudate may affect mesh fusion, leading to displacement or crumpling

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and increasing the risk of patch infection.[5-8] Even though some current research has cast doubt on this view, because of the limited number of relevant literatures and cases and the absence of high quality comparative studies, there are still many disputes over whether synthetic meshes can be used for abdominal wall defects with potential contamination after intestinal resection.[9]

This retrospective study aims to analyze the impact of intestinal resection on the postoperative outcomes of patients who underwent abdominal wall reconstruction with synthetic meshes. Meanwhile, it also explores the safety and efficacy of patch placement in abdominal wall defects with potential contamination.

Materials and Methods

A retrospective analysis of prospectively collected data was performed to evaluate the outcomes of concomitant bowel resection procedure (BRP) (bowel resection and anastomosis) and simultaneous abdominal wall defect/incisional hernia repair with the use of permanent mesh. The results of BRP group were compared to a cohort of patients who underwent ventral/incisional hernia repair with no bowel resection procedure (NRP) during the same period and in the same department between January 2018 and December 2023. Each patient had given informed consent for the procedure, and this study was performed in line with the principles of the Declaration of Helsinki. The local Hospital Clinical Research Ethics Committee approved this study (Number: 2022ZDSYLL458-P01).

All surgeries were performed by the same team of surgeons under general anesthesia. The inclusion criteria for BRP group were patients who underwent both a concomitant bowel resection and anastomosis and abdominal wall defect or ventral/incisional hernia repair. The abdominal wall defects in this group included ventral/incisional hernias, reasons for bowel resection included tumor-related or fistula-related abdominal defects. The bowel procedures in this group included small intestine resection and anastomosis or colon resection and anastomosis, and were classified as Class II (clean-contaminated) or Class III (contaminated) according to the Centers for disease control and prevention (CDC) Wound Classifications.[10]

The exclusion criteria for BRP group were patients who did not undergo bowel resection and anastomosis, those with stoma creation but no intestinal anastomosis, those with strangulated, incarcerated, or grossly contaminated ventral/incisional hernias, those with acute abdominal wall infection or mesh infection, enteric fistula with extended abdominal wall infection or gross spillage, those with portal hypertension or Crohn's disease, and those who underwent only inguinal hernia repair, femoral hernias, or emergency operations.

The inclusion criteria for NRP group were patients who underwent ventral/incisional hernia repair without the above-mentioned bowel procedures and were admitted and treated during the same period as BRP patients. Exclusion criteria for NRP group included patients undergoing emergency repairs for ventral/incisional hernias, inguinal or femoral hernias, or hernia repairs accompanied by bowel procedures.

Demographics data included patient's age, gender, body mass index (BMI), American Society of Anesthesiologists score, comorbidities, medical history, type of ventral/incisional hernia, cause of defect, and defect size (width and length). Perioperative data included surgical approach, mesh type, mesh size, mesh position, operative time, and concomitant bowel procedures.

Preoperative workup

All patients underwent routine preoperative medical evaluation and a computed tomography scan of the abdomen. Patients with tumor-related abdominal defects, those requiring enteric limited fistula takedown, or those with large incisional hernias underwent bowel preparation the day before the operation. BRP patients received prophylactic antibiotics half an hour before induction of anesthesia, while antibiotics were not routinely administered to NRP patients.

The repair was done using either open Sublay prosthetic mesh implantation or laparoscopic intraperitoneal onlay mesh (IPOM) plus procedure. During the procedure, the abdominal cavity was usually entered, at the end of the bowel procedure, and before the abdominal wall reconstruction, all surgical drapes, instruments, and gloves were replaced. The field was then irrigated with 0.9% saline. In the open Sublay procedure, the defect is exposed through the incision. Place a mesh in the extraperitoneal space, cover an area of ≥ 5 cm. In the laparoscopic IPOM plus procedure, the defect was closed if possible, lay the mesh in the abdominal cavity, with at least 5 cm overlap, and fix it by combined suture and stapler.

All the meshes used are non-absorbable synthetic meshes or partially absorbable synthetic composite materials. Then place a drainage tube routinely and apply the compression dressing after the operation. The tube is removed when the drainage volume is less than 20 mL per 24 h.

The patients were followed up by telephone/outpatient clinic at 3 months, 6 months, and 1 year after surgery. We recorded their postoperative recurrence rate, complications, and use the Carolinas comfort scale (CCS)[11] to evaluate patient's postoperative abdominal

wall recovery function. The follow-up ended on August 31, 2024.

Statistics analysis

All data analyses were conducted using Statistical Package for the Social Sciences 26.0 (IBM Corp., Armonk, New York, USA). Categorical variables were compared by chi-square test or Fisher's exact test, and results were expressed as frequencies and percentages (%). For non-normal distributions, we used the Mann–Whitney *U* test and results were expressed as median (lower quartile and upper quartile). *P* value of < 0.05 was considered statistically significant.

Clinical trial registry

This work is a retrospective analytical study. No clinical trials were involved.

Results

A total of 79 patients underwent synthetic mesh implantation for abdominal wall reconstruction were included in this study. Patients were divided into BRP group (22 patients) and NRP group (57 patients) according to whether underwent bowel resection.

As shown in Table 1, there was no statistically significant difference between the two groups in terms of demographic data (in all the comparative demographic parameters, $P > 0.05$). Of the patients, the mean age was 66.82 ± 11.89 years in BRP group and 64.35 ± 15.22 years in NRP group ($P > 0.05$). And the majority of both were ASAIII, 54.55% in BRP group and 43.86% in NRP group, respectively. In comparing BMI, no difference was detected, in BRP group and NRP group, BMI was 22.71 ± 3.44 kg/m^2 and 23.96 ± 3.86 kg/m^2, respectively. There was also no significant difference regarding the defect area between BRP group and NRP group (56.81 ± 66.61 cm^2 vs. 56.81 ± 66.61 cm^2). Among the associated comorbidities, hypertension was the most common comorbidity in two groups (BRP group: 45.45% vs. NRP group: 45.61%, $P > 0.05$), Furthermore, there were 45.45% patients with tumor personal history in BRP group whereas 40.35% patients in BRP group. Diabetes accounted for 18.18% in BRP group and 14.04% in NRP group ($P > 0.05$). And heart disease was found in 13.64% in BRP group and 14.04% of the patients in NRP group, respectively ($P > 0.05$).

When comparing the perioperative conditions, a significant difference was observed between the two groups, as shown in Table 2. All patients were given antibiotics in BRP group, but only 22.81% patients received antibiotics in NRP group. The operation time was found to be significantly longer in BRP group than in NRP group (225.00 ± 102.83 min, 128.42 ± 66.69 min, respectively,

Table 1: Comparison of the basic data of the two groups of patients with and without combined bowel resection

	Combined bowel resection group (*n* = 22)	Uncombined bowel resection group (*n* = 57)	*P* value
Average follow-up time (month)	19.36 ± 17.39	26.04 ± 15.85	0.107
Gender			
Male	15	37	0.784
Female	7	20	0.075
Age (years)	66.82 ± 11.89	64.35 ± 15.22	0.496
ASA score (*n* (%))			
ASA I	3 (13.64)	13 (22.81)	0.535
ASA II	7 (31.82)	19 (33.33)	0.898
ASA III	12 (54.55)	25 (43.86)	0.394
BMI (kg/m^2)	22.71 ± 3.44	23.96 ± 3.86	0.185
Comorbidities *N* (%)			
Hypertension	10 (45.45)	26 (45.61)	0.990
Diabetes mellitus	4 (18.18)	8 (14.04)	0.912
Cancer history	10 (45.45)	23 (40.35)	0.680
COPD	1 (4.55)	0 (0)	0.278
Heart disease	3 (13.64)	8 (14.04)	0.752
Cerebral embolism	1 (4.55)	8 (14.04)	0.427
Renal insufficiency	1 (4.55)	2 (3.51)	1.000
Parkinson disease	1 (4.55)	2 (3.51)	1.000
Intestinal obstruction	3 (13.64)	2 (3.51)	0.254
Defect area (cm^2)	76.32 ± 73.37	56.81 ± 66.61	0.260
Surgical procedure (*n* (%))			
Open Sublay	13 (59.09)	28 (49.12)	0.427
IPOM +	9 (40.91)	29 (50.88)	0.427

ASA = American Society of Anesthesiologists Score, BMI = body mass index, COPD = chronic obstructive pulmonary disease, IPOM = laparoscopic intraperitoneal onlay mesh

$P < 0.01$). The average length of hospitalization was 14.05 ± 8.45 days in BRP group, wherever only 7.26 ± 3.80 days in NRP group ($P < 0.01$).

Table 2: Comparison of surgical data between two groups of patients with and without combined bowel resection

	Combined bowel resection group (n = 22)	Uncombined bowel resection group (n = 57)	P value
Antibiotic use (n (%))	22 (100.00)	13 (22.81)	0.000
Operative time (min)	225.00 ± 102.83	128.42 ± 66.69	0.000
Postoperative hospital stay (d)	14.05 ± 8.45	7.26 ± 3.80	0.001

Table 3: Comparison of follow-up data between two groups of patients with and without combined bowel resection

	Combined bowel resection group (n = 22)	Uncombined bowel resection group (n = 57)	P value
Complication (n (%))	8 (36.36)	21 (36.84)	0.968
Incision infection	1 (4.55)	3 (5.26)	0.659
Seroma	1 (4.55)	1 (1.75)	0.482
Chronic pain	1 (4.55)	10 (17.54)	0.257
Intestinal obstruction	5 (22.73)	4 (7.02)	0.115
Patch infection	1 (4.55)	4 (7.02)	0.912
Postoperative recurrence (n (%))	2 (9.09)	5 (8.77)	0.691
Total CCS score, P50 (P25, P75), (score)	2.000 (0.0, 9.8)	3.000 (0.0, 12.0)	0.893

CCS = Carolinas comfort scale

Patient' postoperative recurrence, complications, and recovery, and abdominal wall function are presented in Table 3. Both groups exhibited similar overall postoperative complication rates (BRP group: 36.36% vs. NRP group: 36.84%, $P > 0.05$), the types and frequencies of complications diverged markedly. Bowel obstruction was the most common complication in BRP group, which was a three-fold higher incidence than NRP group, although the difference was not significant (22.73% vs. 7.02%, $P > 0.05$). In contrast, NRP group showed a 3.9-fold predominance of chronic pain (17.54% vs. 4.55%, $P > 0.05$) and higher mesh infection rates (7.02% vs. 4.55%, $P > 0.05$), though surgical site infections (SSIs) were comparable (4.55%, 5.26%, respectively, $P > 0.05$). Notably, one patient developed concurrent mesh infection and chronic pain in BRP group, while one presented bowel obstruction along with mesh infection in NRP group. No statistically significant differences were observed in postoperative complications between the groups.

There were two cases (9.09%) of recurrence in BRP group, occurring between the period of 3 and 6 months postoperatively, and there were five cases (8.77%) of recurrence in NRP group, three of these occurred between 3 and 6 months, and two occurred between 6 and 12 months ($P > 0.05$).

There was no statistically significant difference in the median CCS total score between BRP group and NRP group (2 vs. 3, $P > 0.05$). In BRP group, the majority (17 patients, 77.27%) reported scores between 0 and 10 (indicating no or mild discomfort), while five patients (22.73%) scored 11–50 (moderate discomfort) [Figure 1]. Comparatively, 71.93% (41 patients) showed in the 0–10 range and 28.07% (16 patients) scored 11–60 in NRP group [Figure 2]; therefore, there was no statistically significant difference between two groups ($P > 0.05$).

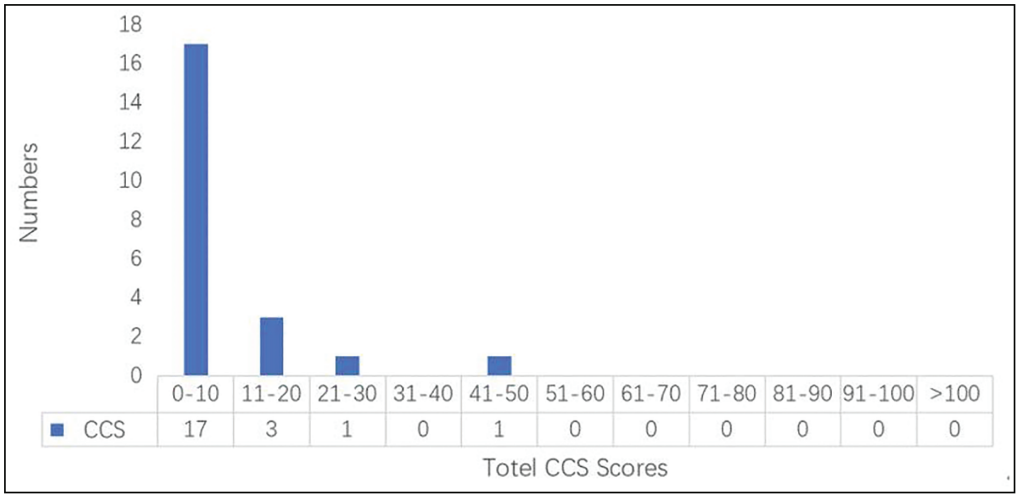

Figure 1: Distribution of total Carolinas comfort scale scores in the combined bowel resection group

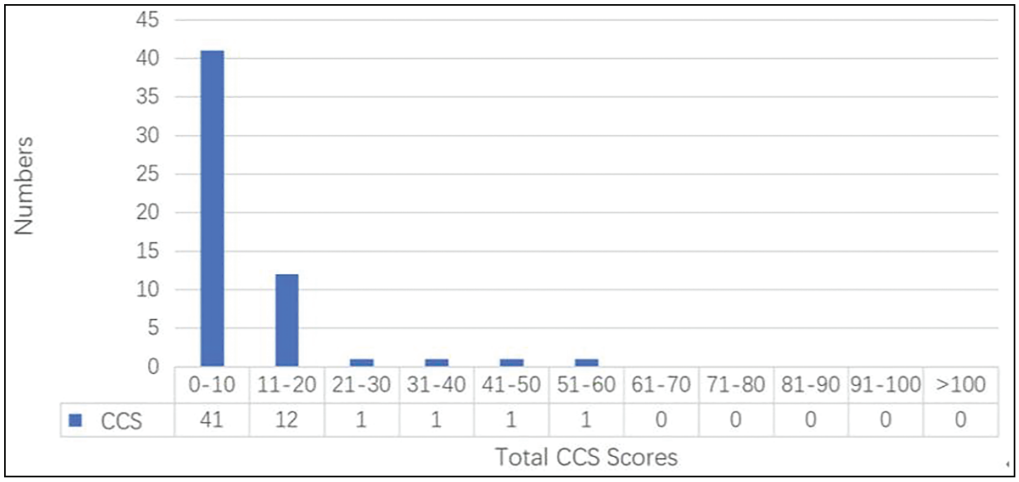

Figure 2: Distribution of total Carolinas comfort scale scores in the non-combined bowel resection group

Most patients in both groups reported only mild postoperative discomfort and had similar recovery of abdominal wall function.

Discussion

At present, mesh implantation repair represents a prevalent approach for abdominal wall restoration. The recurrence rate following the defect repair procedure is notably lower than that associated with the conventional direct suture technique.[12] It is worth noting that in complex clinical scenarios, such as surgeries with concurrent intestinal adhesions, secondary intestinal ischemia and necrosis due to incarcerated hernias, or potentially contaminated surgeries that require combined resection of intestinal tumors, there still exist academic controversies regarding the selection of the repair timing.[13] Certain individuals propose a single-stage repair strategy, which involves mending the defect and eliminating the contamination source during the operation.[14] Conversely, a greater number of individuals advocate for a multi-stage reconstruction approach. This entails conducting a planned second-stage surgery to strengthen the repair using a mesh after the infection has been brought under control for a period of 3–6 months.[15,16] Recent evidence further supports the safety of synthetic meshes in contaminated fields. A study comparing slowly absorbable synthetic mesh to permanent and biologic mesh in CDC class III contaminated surgeries demonstrated comparable short- and long-term outcomes when placed in the sublay position, emphasizing the importance of mesh positioning for optimal results.[17] These findings align with the growing consensus that synthetic meshes, when appropriately selected and positioned, can be safely utilized in contaminated environments without compromising durability or increasing complications.[18] At present, the consensus still suggests making individualized decisions according to the degree of intraoperative contamination, the patient's overall condition, and the experience of the surgical team.[19]

This study compared the postoperative complications and recurrence situations of 22 patients who underwent concurrent bowel resection during abdominal wall reconstruction with those of 57 patients who did not. The outcomes revealed that the overall postoperative complication rates of the two groups were alike, signifying that concurrent bowel resection did not raise the likelihood of postoperative complications.[20] Consequently, putting meshes in the potentially contaminated environment are secure and efficacious. Geisler's study[21] indicated that the incidence of postoperative complications linked to the employment of non-absorbable synthetic meshes in bowel resection cases was 7%, which further corroborated the findings of our study.

Postoperative surgical site infection is one of the most common surgical site complications, and whether bowel resection increases SSIs is still conflicting. Nieuwenhuizen *et al*.[22] reported a high wound infection rate who had bowel resection followed by the implantation of the mesh, while there was no statistically significant difference in the postoperative incision and mesh infection rates between the two groups of patients in this study,[23] which aligns with recent advancements in infection management strategies. Although resection and anastomosis entail a substantial risk of bacterial contamination, adherence to strict intraoperative contamination control measures can significantly decrease bacterial load, such as the use of wound protectors, copious irrigation, and instrument change before mesh implantation. Moreover, the strategic postoperative use of broad-spectrum antibiotics,

continued for a duration that encompasses the window of potential anastomotic leakage, further mitigates the risk of infectious complications. Guo *et al*.[24] demonstrated that prophylactic negative pressure wound therapy (pNPWT) significantly reduces SSIs, particularly superficial infections, after ventral hernia repair. While our study did not employ pNPWT, the observed low SSI rates (4.55% in BRP group vs. 5.26% in NRP group) suggest that enhanced infection control protocols, such as routine antibiotic use and drainage placement, may compensate for contamination risks. Future studies incorporating pNPWT could further optimize outcomes in high-risk populations. Relevant literature also shows that compared with multi-stage reconstruction repair, single-stage repair combining resection of the infected area and mesh repair in contaminated situations does not increase the probability of postoperative defect recurrence or mesh infection.[25-28] The findings of this study are in line with these results. A 10-year retrospective analysis conducted by Bessa *et al*.[29] also indicated that currently there is no evidence to support that contaminated abdominal wall defect environments, such as incarceration, strangulation, or wound infection, will lead to an increased mesh infection rate.[30]

In this study, all patients in the resection group received anti-infection treatment during the course of the disease, and drainage tubes were placed after the surgery. The antibiotic usage rate was significantly higher than that in the non-resection group, which also effectively reduced the risk of postoperative infection.[26] The WSES guidelines[31] also recommend 48-h antibacterial prophylaxis for patients with concurrent bowel strangulation or those who undergo resection of any organ at the same time. In addition, the management of mesh infections is pivotal to avoiding reoperation. In our cohort, 4.55% of BRP group patients developed mesh infections, all successfully managed conservatively with antibiotics and drainage. This aligns with Li *et al*.,[32] whose systematic review emphasized that infected meshes with favorable characteristics—large-pore monofilament polypropylene materials and onlay/sublay positioning—can be salvaged using NPWT-based approaches with a 74.6% success rate. All patients in the BRP group in this study received implants of large-pore polypropylene or polyester mesh. Evidence suggests that large-pore monofilament polypropylene or monofilament mesh offers superior bacterial clearance in settings involving contamination or established infection compared to other mesh types.[33] Sanders *et al*.[34] also noted that pore size markedly affects bacterial adhesion, with a higher propensity for bacterial retention observed in smaller-pore meshes relative to larger pores. These findings reinforce the utility of large-pore lightweight mesh in mitigating bacterial infection risk, thereby contributing to reduced recurrence rate. Our cases involved non-absorbable or partially absorbable synthetic meshes placed in sublay or intraperitoneal positions, which may explain the efficacy of conservative management. These findings challenge the traditional paradigm of mandatory mesh removal and highlight the importance of material selection and anatomical placement in mitigating infection risks.[35]

Postoperative intestinal obstruction is a common complication of laparoscopic ventral hernia repair. It arises from factors such as paralytic intestinal obstruction after adhesiolysis, mechanical obstruction from bowel entrapment, or adhesions related to mesh or patient factors. In this study, no severe serious abdominal infections occurred in BRP, which may explain the similar intestinal obstruction rates between two groups. In addition, anti-adhesive mesh was used in all laparoscopic IPOM+ procedures. Borrazzo *et al*.[36] reported in a porcine model that using a polypropylene mesh with a bioabsorbable barrier (PPM/HA/CMC) led to significantly less adhesion compared to the standard kind (14% vs. 40%, $P = 0.01$). In open sublay repair, the mesh avoids bowel contact, thereby minimizing adhesion risk. Preventive measures such as preoperative bowel preparation, gentle tissue handling, and delayed liquid intake until bowel recovery also help reduce intestinal obstruction incidence.

Postoperative recurrence is influenced by multiple factors, including the quality of surgical repair, as well as specific clinical characteristics, such as the size and grading of the defect, the degree of local contamination, and the patient's infectious status.[37] In this study, however, no significant difference in recurrence rates was observed between the two groups, with both demonstrating rates below 10%. This favorable outcome may be attributed to stringent anti-infection protocols implemented during the preoperative and postoperative phases, in combination with meticulous aseptic techniques intraoperatively. Furthermore, existing evidence indicates that prophylactic antibiotic administration during the perioperative period can reduce the risk of SSIs, particularly in potentially contaminated cases such as strangulated hernias.[26] However, these recurrences were detected during 1 year follow-up (relative early period), although low, which could be attributed to technique errors, such as small mesh size, incorrect mesh position, or unstable fixation.

The primary long-term objective of abdominal wall reconstruction is to enhance patients' quality of life. In this investigation, the CCS scale was employed to assess the postoperative recovery of the abdominal wall in patients, thereby reflecting their quality of life.[38] One study shows that there is a decrease in abdominal wall strength and power in patients suffering from incisional

hernia in comparison with healthy controls.[39] In our cohort, the majority of patients, 77.27% in BRP group and 71.93% in NRP group, indicated either no discomfort or only mild discomfort. The results were comparable and there was no significant disparity between the two groups. Montauban *et al*.[38] also revealed that 82% of patients with abdominal wall defects had a CCS score within the range of 0–10 points post-surgery, and the average scores for the foreign body sensation of the mesh, pain, and limitation of movement during each routine activity were all below one, suggesting a high quality of life after the operation, which aligns with the findings of our study. The low incidence of mesh-related discomfort in our study may also reflect the use of lighter-weight meshes.[35] Consequently, for patients who underwent abdominal wall reconstruction using artificial mesh along with concurrent bowel resection, the postoperative recovery of the abdominal wall shows little difference compared to those without bowel resection, and both groups enjoy a relatively high quality of life. Notably, comparative studies on robotic, laparoscopic, and open ventral hernia repair found no significant differences in pain intensity or quality of life between approaches, though robotic repair showed a marginal advantage in reducing bulge recurrence.[40] These insights underscore the need for personalized surgical strategies that balance technical feasibility, contamination risk, and patient-specific factors to optimize recovery.

Therefore, the findings of this study indicate that concurrent bowel resection and defect site repair are not only a safe and efficacious approach but also can significantly reduce the pain and financial strain associated with a second surgical procedure for patients, particularly those with suboptimal general health status who may be unable to withstand a second operation. Kao *et al*.'s review on the management of mesh infection suggested that patients are more inclined to accept the risk of a higher recurrence rate rather than undergo a second surgery. [41] So it is important to choose an appropriate surgical method by taking into account various factors comprehensively, such as the patient's overall condition, the infection status of the surgical site, and other relevant aspects. This approach can help minimize the incidence of postoperative complications and recurrence, ultimately enhancing the patient's quality of life.

Limitation

Our research has several limitations. First, it is a single-center, retrospective research, and the patient selection was limited and nonrandomized. Second, we lacked a comparison of preoperative and postoperative CCS scores; it has the potential to bias the results of the study. Third, our surgical interventions were limited to conventional techniques, without incorporation of emerging technologies such as robotic-assisted procedures or minimally invasive sublay approaches, and the absence of comparative data between traditional methods and modern techniques precludes assessment of potential advantages in complication profiles or patient-reported outcomes associated with these innovations. We believe that there is a need for a larger study population, a longer time period, and comparative randomized trials to further substantiate and validate our results. However, our study indeed has some strength; we have a complete and close follow-up of the patients, including functional status of the cohort; therefore, the present study provide some insights in this specific and common condition, when abdominal wall reconstruction was associated with bowel resection.

Conclusion

Concurrent bowel resection will prolong the operation time and the postoperative recovery period. However, the performance of concurrent intestinal resection did not exert significant impact on the postoperative recurrence rate, the occurrence of complications, and the restoration of abdominal wall function in patients. Inserting artificial meshes in areas in this condition is both safe and effective, and simultaneous surgeries can efficiently alleviate patients' distress. We recommend to take into comprehensive consideration the specific circumstances of patients so as to select the most suitable treatment strategy.

Author contributions

YX, YX, XS, and JL were involved in study concepts, design, and definition of intellectual content. YX and YX conducted the investigation and manuscript writing. All authors read and approved submission.

Ethical policy and Institutional Review board statement

This study was conducted in full accordance with the ethical principles set forth in the Declaration of Helsinki. The research was reviewed and approved by the local Hospital Clinical Research Ethics Committee (Number: 2022ZDSYLL458-P01) on January 52023.

Declaration of patient consent

Patient was enrolled in the study after duly signed informed consent.

Data availability statement

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

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Nil.

Conflicts of interest
There are no conflicts of interest.

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Abbreviations

BRP	Bowel resection procedure
NRP	No bowel resection procedure
BMI	Body mass index
ASA	American Society of Anesthesiologists
IPOM	Laparoscopic intraperitoneal onlay mesh
CCS	Carolinas comfort scale
pNPWT	Prophylactic negative pressure wound therapy
SSIs	Surgical site infections

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