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Omentoplasty for pelvic defect closure following abdominoperineal resection in lower rectum cancer

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Abstract

Background
The perineal wound is considered an important source of postoperative morbidity and mortality following abdominoperineal resection (APR). Complications include wound dehiscence, infection, abscess, perineal herniation, radiation enteritis, persistent sinus, more nursing effort, prolonged hospital stay, and increase readmission with cost increase.

Aim
The aim of this study is to compare the result of conventional closure of pelvic defect following APR versus closure with omentoplasty.

Patients and methods
This study included 30 patients who underwent APR. The patients were divided into two groups: omentoplasty group included 15 patients who underwent pelvic defect closure using pedicle omental flap, and conventional group included 15 patients who underwent surgery with conventional closure of pelvic defect.

Technique
Voluminous omental flap is harvested with proper length, with good perfusion and vascularity. Then, it is used as plug for closure of the dead space in the pelvis obtained after APR.

Results
Pedicle omental flap fashioning, mobilization, and transposition supporting perineal defect following APR results in reduction of pelvic dead space and enables safe closure with reasonable operative time and reduction in postoperative wound complications.

Conclusion
Omentoplasty for closure of pelvic defect following APR is an applicable and safe method that supports perineal wound closure with less complications.

Keywords: Abdominoperineal, omentoplasty, pelvic defect

Introduction

The perineal wound is an important source of postoperative morbidity and mortality following abdominoperineal resection (APR) [1]. Complications following APR include wound dehiscence, infection, abscess formation, perineal herniation, radiation enteritis and persistent sinus are the causes of prolonged hospital stay, and readmission with increasing cost, and the need for nursing care [2–5]. Perineal wound complications following APR seriously affect patients' survival, as they result in delayed adjuvant therapy and increase incidence of local recurrence [6,7]. Technically, primary perineal wound closure is a preferred, applicable choice for closure, but large defects necessitate alternative management

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strategies. Pedicle omental flap is an ideal support for pelvic defect following APR owing to its physical ability to fill dead spaces and its physiological prosperities (tissue factor production, angiogenesis promotion, immune modulation) that proved to decrease incidence of perineal wound complications following resection [8,9]. A suitable pedicle omental flap should be fashioned to be long enough with good blood supply to reach the pelvic floor without tension covering any existing defect.

Patients and methods

The study was performed between October 2017 and November 2019. A total of 30 patients underwent open APR for cancer of lower rectum after taking consent. Overall, 15 patients were closed by omentoplasty closure (Fig. 1) and 15 patients were closed by conventional closure of pelvic defect (Fig. 2) in the surgical oncology department, Al-Ahrar Zagazig Teaching Hospital, Egypt; in General Surgery Department, Banha Teaching Hospital, Egypt; and in General Surgery Department, Alsahel Teaching hospital, Egypt.

Inclusion criteria

The following were the inclusion criteria:

(1) Male and female patients
(2) Age more than 20 years
(3) Cancer lower rectum stages I and II
(4) No uncompensated morbidities: no uncontrolled diabetes mellitus, no uncontrolled hypertension, and no advanced cardiac or hepatic disorders
(5) Normal coagulation profile: platelets count more than 100 000/ml, no bleeding dyskaryosis/coagulopathy, and no history of anticoagulant therapy
(6) No extreme of body weight, that is, not severely obese
(7) No history of steroid use.

Exclusion criteria

The following were the exclusion criteria:

(1) Uncompensated morbidities: uncontrolled diabetes mellitus, uncontrolled hypertension, or advanced cardiac or hepatic disorders
(2) Abnormal coagulation profile: platelets count less than 99 000/ml, bleeding dyskaryosis/coagulopathy, or history of anticoagulant therapy
(3) Extreme of body weight, that is, severely obese
(4) History of steroid use.

Technique

In our study, technique was aiming to obtain long omental pedicle flap with good blood supply. The greater omentum was dissected from the transverse colon after delivering the stomach and transverse colon outside the abdomen. Through avascular plane, dissection was continued between the antimesenteric border of the transverse colon and the posterior layer of the greater omentum. We constructed our pedicle flap depending on left gastroepiploic artery. The greater omentum was then detached from the greater curvature of stomach. The gastroepiploic arterial arcade was retained in the omental pedicle graft. Perforating vessels supplying the stomach from the arcade are ligated and then divided, and hemostasis was confirmed.

The omental pedicle must not be subjected to tension and must be kept moist during the procedure. Once mobilization was completed, the vascular arcade was divided toward right gastroepiploic artery keeping long, well-vascularized, and nontension flap based on left gastroepiploic artery.

The pedicle flap is secured by sutures to sacral promontory and peritoneum.

Statistical analysis

Data were collected, revised, coded, and entered to the IBM Corp. Released 2015. IBM SPSS Statistics for Windows, Version 23.0. IBM Corp, Armond, New York, USA. The quantitative data were presented as mean, SDs, and ranges when parametric, whereas qualitative data were presented as numbers and percentages. The comparison between groups regarding qualitative data was done by using χ^2 test. The comparisons between two independent groups with quantitative data and parametric distribution were done by using independent *t* test. The confidence interval was set to 95% and the margin of error accepted was set to 5%. So, the *P* value was considered significant at *P* value less than 0.05.

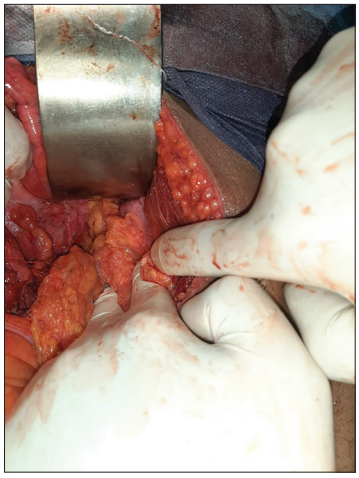

Figure 1: Omentoplasty closure of pelvic defect.

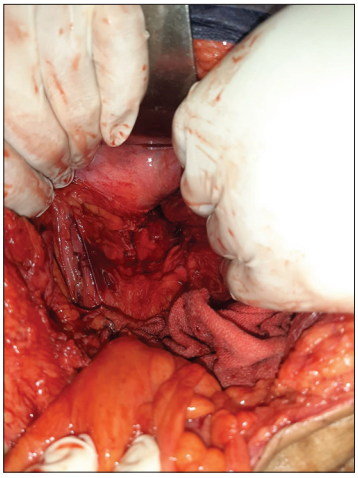

Figure 2: Conventional closure.

Results

The patients were randomized into two equal groups. Omentoplasty group included 15 patients who underwent pelvic defect closure using pedicle omental flap , and the conventional group included 15 patients who underwent APR with conventional closure of pelvic defect.

Regarding patients' epidemiological characteristics, as shown in Table 1, there was no significant difference in the mean age of patients (38.22 ± 5.76 and 37.01 ± 6.81 years) in omentoplasty group and conventional group, respectively ($P = 0.603$, $t = 0.525$).

Patients' sex had no significant difference in this study. Omentoplasty group included six (40.0%) males and nine (60.0%) females, whereas conventional group included seven (46.7%) males and eight (53.3%) females ($P = 0.712$, $t = 0.136$).

The mean BMI of patients was 28.67 ± 4.85 kg/m^2 in omentoplasty group and 27.92 ± 4.92 kg/m2 in conventional group, making a nonsignificant difference ($P = 0.677$, $t = 0.420$).

Smoking was of no significant statistical difference. The mean number of smoker patients in omentoplasty group was three (20.0) and five (33.3%) in the conventional group ($P = 0.130$, $t = 5.636$), making a nonsignificant difference ($P = 0.408$, $t = 0.682$).

Medical comorbidities in the two studied groups are plotted in Table 2. There was no significant difference in the number of patients with diabetes mellitus [two (13.3%) in omentoplasty group and four (26.7%) in conventional group] ($P = 0.361$, $t = 0.833$). Furthermore, there was no significant difference in the number of hypertensive patients [three (20.0%) and (five (33.3%) in omentoplasty group and conventional group, respectively; $P = 0.408$, $t = 0.682$]. Moreover, the number of other chronic diseases was of no significant difference, as it was two (13.3%) and three (20.0%) in omentoplasty group and conventional group, respectively ($P = 0.624$, $t = 0.240$).

Table 3 shows the early postoperative complications in both study groups (Fig. 3). There was a significant difference in the number of patients diagnosed with postoperative seroma in both groups [two (13.3%) and seven (46.7%) in omentoplasty group and conventional group, respectively; $P = 0.046$, $t = 3.968$]. In addition, the number of patients with postoperative wound infection was of a significant difference, as it was one (6.7%) in omentoplasty group, and six (40.0%) in conventional group ($P = 0.030$, $t = 4.658$). Regarding the number of postoperative wound dehiscence, there was no significant difference, as it was one (6.7%) in omentoplasty group and two (13.3%) in conventional group ($P = 0.543$, $t = 0.543$). Moreover, the number of patients with postoperative fever showed no significant difference, as it was one (6.7%) in omentoplasty group and two (13.3%) in traditional group ($P = 0.543$, $t = 0.370$).

Regarding the number of patients with postoperative paralytic ileus, there was no significant difference, as it was four (26.7%) in omentoplasty group and six (40.0%) in conventional group ($P = 0.438$, $t = 0.600$).

Table 4 shows the late postoperative outcome in both study groups (Fig. 4). There was a significant difference in the

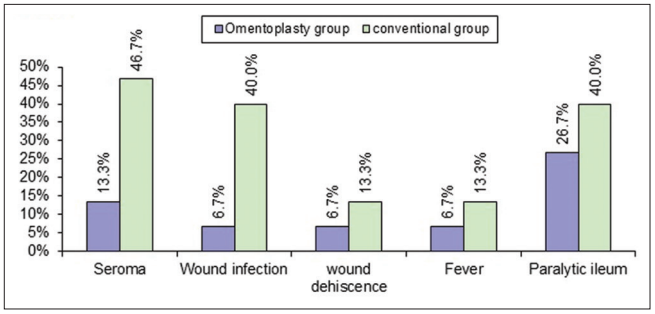

Figure 3: Omentoplasty – traditional group.

Table 1: Epidemiological characteristics of the studied groups

	Omentoplasty group (n=15)	Conventional group (n=15)	P	Test value
Age (years) (mean±SD)	38.22±5.76	37.01±6.81	0.603	0.525[a]
Sex [n (%)]				
Male	6 (40.0)	7 (46.7)	0.712	0.136[b]
Female	9 (60.0)	8 (53.3)		
BMI (kg/m^2), (mean±SD)	28.67±4.85	27.92±4.92	0.677	0.420[a]
Smoking [n (%)]	3 (20.0)	5 (33.3)	0.408	0.682[b]

[a]Independent t test. [b]χ^2 test.

Table 2: Morbidities in the studied groups

	Omentoplasty group (n=15) [n (%)]	Conventional group (n=15) [n (%)]	P	Test value
Diabetes	2 (13.3)	4 (26.7)	0.361	0.833[a]
Hypertension	3 (20.0)	5 (33.3)	0.408	0.682[a]
Other chronic diseases	2 (13.3)	3 (20.0)	0.624	0.240[a]

[a]χ^2 test.

number of patients with hospital readmission in both groups [eight (53.3%) and three (20.0%) in conventional group and omentoplasty group, respectively; $P = 0.020$, $t = 5.400$]. In addition, the number of patients with postoperative secondary suture was of a significant difference, as it was two (13.3%) in omentoplasty group, and seven (46.7%) in the conventional group ($P = 0.046$, $t = 3.968$).

Discussion

The ideal management of the pelvic defect following APR is still a point of debate.

Thus, in our study, we demonstrated the obliteration of pelvic dead space after APR using omental flap mobilization and transposition to fill the pelvic defect to avoid postoperative complications in comparison with conventional closure without omental flap fixation.

A total of 30 patients underwent open APR. They were divided into two groups, with 15 patients were involved in each group (omentoplasty group and conventional groups).

Our study showed that both groups of patients regarding epidemiological factors (including age, BMI, smoking, and sex) and presence of morbidities (diabetes mellitus, hypertension, and other chronic diseases) had no significant statistical difference.

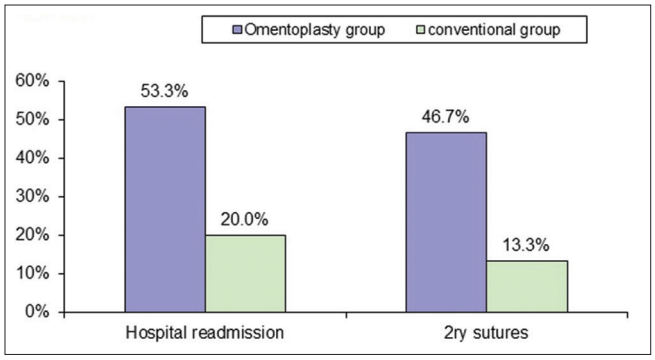

Figure 4: Omentoplasty – traditional group.

Regarding early postoperative complications (seroma, wound infection, wound dehiscence and paralytic ileus), Colin Peirce and Sean Martin reported that omentoplasty reduces postoperative complications such as seroma, wound infection, and wound dehiscence but increases paralytic ileus [10]. Moreover, Sagebiel *et al*.[11] reported that omental flap used in APR reduces postoperative complications such as seroma and wound infection. Our study shows statistical difference between both groups.

Regarding late postoperative complications (hospital readmission and secondary sutures), our study showed a significant reduction in both of these complications in omentoplasty group. These conclusions were similar to those of a previous systematic review that indicated there is likely a benefit with omentoplasty, but the evidence was not conclusive owing to a lack of randomized studies [10]. As there was less seroma, wound infection, wound dehiscence, and paralytic ileus, the omentum is considered an optimum visceral example to occupy any pelvic dead space following APR. This technique presents an omental flap that is voluminous and well vascularized with satisfactory length to reach the pelvic floor, with reasonable additional operative time required. Moreover, this technique does not require a well-experienced surgeon.

Omental flap pelvic defect plication technique provides a supportive primary perineal wound closure in additional to reducing pelvic dead spaces.

The technique of omental flap is associated with less complications such as hemorrhage and infection that have been reported [12].

Conclusion

A well-constructed omental flap for closure of dead space of the pelvis represents an ideal accepted feasible and applicable technique with lower incidence of complications in comparison with conventional closure following APR in lower rectum cancer.

Table 3: Early postoperative outcome of the studied groups

	Omentoplasty group [*n* (%)]	Conventional group [*n* (%)]	*P*	Test value
Seroma	2 (13.3)	7 (46.7)	0.046	3.968[a]
Wound infection	1 (6.7)	6 (40.0)	0.030	4.658[a]
wound dehiscence	1 (6.7)	2 (13.3)	0.543	0.370[a]
Fever	1 (6.7)	2 (13.3)	0.543	0.370[a]
Paralytic ileum	4 (26.7)	6 (40.0)	0.438	0.600[a]

[a]χ^2 test.

Table 4: Delayed postoperative outcome of the studied groups

	Conventional group	Omentoplasty group	*P*	Test value
Hospital readmission	8 (53.3)	3 (20.0)	0.020	5.400[a]
Secondary sutures	7 (46.7)	2 (13.3)	0.046	3.968[a]

[a]χ^2 test.

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Nil.

Conflicts of interest
There are no conflicts of interest.

References
1. Wiatrek RL, Thomas JS, Papaconstantinou HT. Perineal wound complications after abdominoperineal resection. Clin Colon Rectal Surg 2008; 21:76-85.
2. El-Gazzaz G, Kiran RP, Lavery I. Wound complications in rectal cancer patients undergoing primary closure of the perineal wound after abdominoperineal resection. Dis Colon Rectum 2009; 52:1962-1966.
3. Hultman CS, Sherrill MA, Halvorson EG, Lee CN, Boggess JF, Meyers MO, Calvo BA, Kim HJ. Utility of the omentum in pelvic floor reconstruction following resection of anorectal malignancy: patient selection, technical caveats, and clinical outcomes. Ann Plast Surg 2010; 64:559-562.
4. Waddell BE, Rodriguez-Bigas MA, Lee RJ, Weber TK, Petrelli NJ. Prevention of chronic radiation enteritis. J Am Coll Surg 1999; 189:611-624.
5. Regimbeau JM, Panis Y, Gouzi JL, Fagniez PL. Operative and long term results after surgery for chronic radiation enteritis. Am J Surg 2001; 182:237-244.
6. Kressner U, Graf W, Mahteme H, Pahlman L, Glimelius B. Septic complications and prognosis after surgery for rectal cancer. Dis Colon Rectum 2002; 45:316-321.
7. Foster J, Pathak S, Smart NJ, Branagan G, Longman RJ, Thomas MG, Francis N. Reconstruction of the perineum following extralevator abdominoperineal excision for carcinoma of the lower rectum: a systematic review. Colorectal Dis 2012; 14:1052-1059.
8. Hay JM, Fingerhut A, Paquet JC, Flamant Y. Management of the pelvic space with or without omentoplasty after abdominoperineal resection for carcinoma of the rectum: a prospective multicenter study. Eur J Surg 1997; 163:199-206.
9. Nilsson PJ. Omentoplasty in abdominoperineal resection: a review of the literature using a systematic approach. Dis Colon Rectum 2006; 49:1354-1361.
10. Peirce C, Martin S. Management of the perineal defect after abdominoperineal excision. Clin Colon Rectal Surg 2016; 29:160–167.
11. Sagebiel TL, Faria SC, Balachandran A, Sacks JM, You YN, Bhosale PR. Pelvic reconstruction with omental and VARM flaps: anatomy, surgical technique, normal postoperative findings, and complications. Radiographics 2011; 31:2005-2019.
12. De Broux E, Parc Y, Rondelli F, Dehni N, Tiret E, Parc R. Sutured perineal omentoplasty after abdominoperineal resection for adenocarcinoma of the lower rectum. Dis Colon Rectum 2005; 48:476-481. discussion 481-2.e626.