



Feasibility of Sphincter Saving in Comparison to Abdominoperineal Resection

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Authors' contributions

This work was carried out in collaboration among all authors. Author MSA designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors ISAE and ASAAEG managed the analyses of the study. Author MAN managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Introduction: Intersphincteric resection of low rectal tumors is a surgical technique extending rectal resection into the intersphincteric space. This procedure is performed by a synchronous abdominoperineal approach with mesorectal. Excision and excision of the entire or part of the internal sphincter

Aim of the Work: Is to assess the feasibility of sphincter sparing procedure compared to classic abdominoperineal resection.

Patient: Group A patients (10 patients): who meet the criteria of intersphincteric resection (ISR) possibility and candidates for sphincter saving procedures Group B patients (10 patients): who didn't meet the criteria to do ISR, were subjected to abdominoperineal resection (APR). This work was conducted at Beni Suef university hospital between January 2019 and March 2020.

Methods: A. Total ISR involves complete excision of the internal sphincter. The cut line is at the intersphincteric groove. B. Subtotal ISR involves partial excision of the internal sphincter. The cut line is between the dentate line and the intersphincteric groove. C. Modified partial ISR the cut line is

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below the dentate line on one side of the tumor. On the opposite side of the tumor, the cut line is above the dentate line. D Partial ISR the cut line is at or above the level of the dentate line.

Results: The incidence of complications were higher without significance in sphincter saving group of patients (wound infection- burst abdomen-paralytic ileus-skin maceration).

Conclusion: In low rectal cancer, the sphincter saving appears to be feasible with little complications that worth the avoidance of APR permanent dysfunctions.

Keywords: Abdominoperineal resection; surgical technique; sphincter saving.

1. INTRODUCTION

Recently, intersphincteric resection (ISR) has been proposed to serve sphincter saving in patients with very low rectal lesions, as an alternative to APR [1].

Intersphincteric resection of low rectal cancer is an operation extending rectal resection into the intersphincteric plane. This intervention is performed by a synchronous abdominoperineal approach with mesorectal excision and excision of the entire or part of the internal sphincter [2].

The idea of the ISR technique is based on the facts that rectal cancer growing into the visceral structures, i.e. proximally the rectum and distally the internal anal canal; and that there is an embryonic plane of fusion between the visceral structures and the surrounding somatic skeletal muscles of the pelvic floor. The aim is to remove the rectum without damaging the skeletal muscles [3]. Pathways of lymphatic spread of rectal cancer was early well studied by Miles (1910,1926). From his operative and postmortem specimens, he concluded that lymphatic spread occurred in 3 directions: upwards, lateral and downwards [4]. Upward spread: consists of spreading along lymphatics accompanying the superior rectal and inferior mesenteric vessels as they lie in the mesorectum and base of mesocolon. Further upward spread involves the para-aortic nodes. Lateral spread: according to Miles was relatively common, first to the nodes in the lateral ligaments, then reaches the nodes around the internal iliac vessels on the pelvic side walls. Downward spread: involves the lymphatics of the sphincter ani, perianal skin and ischiorectal fat. If spread involves the tissues around the anal canal, the inguinal lymph nodes may be involved. Miles considered the upward spread the most frequent mode of lymphatic spread, but also the lateral and downward modes are frequently occurring. Miles considered abdominoperineal resection the only way able to deal adequately with all the 3 modes of lymphatic spread. This concept was accepted and obeyed for a while [4,5,6,7,8,9].

Downward lymphatic spread seems to occur only when the nodes along the superior rectal vessels were choked with metastasis, allowing retrograde spread to occur [10]. The rarity of lateral and down spread was confirmed by Goliger and his colleagues.1951 by studying 1500 abdominoperineal resection specimens. Lymph node spread below the tumor was found in 98 cases (6.5 %). In 68 of the 98 the glands were within 6 mm from the lower margin of the primary tumor, and the other 30 cases (2 %) the spread was more than 20 mm. All of the 98 cases with this downward spread had extensive nodal involvement around the superior rectal vessels [11].

2. PATIENTS

This study has been conducted at Beni-Suef university hospital – Beni-Suef University between Jan. 2019 and March 2020 and diagnosed with low rectal cancer (extraperitoneal) with clinical stages II (cT3-4, N0, M0) and III (cT1-4, N+, M0).

2.1 Inclusion Criteria

- 1-Low rectal cancer: distal tumor edge within 3-6 cm from the anal verge.
- 2- Disease stage: stage II and stage III.
- 3- Satisfactory preoperative sphincter function and continence

2.2 Exclusion Criteria

- 1-Unsatisfactory preoperative sphincter function and continence.
- 2-Disease stage: Stage I

2.3 Indications of ISR

Low rectal tumors: With distal tumor edge at a distance ranging from 3 to 6 cm from the anal verge.

Local spread restricted to rectal wall or internal anal sphincter (IAS) (i.e. T2).

- 3- Satisfactory preoperative sphincter function and continence.
- 4- Absence of distant metastases.

2.4 Contraindications of ISR

- 1- T4 lesions (tumors invading the visceral peritoneum or adjacent organs or structures: including puborectalis).
- 2- Unsatisfactory preoperative sphincter function and continence.
- 3- Tumors invading the external anal sphincter (EAS) (i.e.T3).

Accordingly, patients were categorized preoperatively as follows:

Group A patients (10 patients): Who meet the criteria of ISR possibility and candidates for sphincter preserving procedures.

Group B patients (10 patients): Who didn't meet the criteria mentioned above to do ISR, were subjected to APR.

3. METHODS

Preoperative concomitant chemoradio-therapy (CCRT):

3.1 Surgical Technique

ISR candidates: Total ISR involves complete excision of the internal sphincter. The cut line is at the intersphincteric groove. B. Subtotal ISR involves partial excision of the internal sphincter. The cut line is between the dentate line and the intersphincteric groove. C. Modified partial ISR the cut line is below the dentate line on one side of the tumor. On the opposite side of the tumor, the cut line is above the dentate line. D Partial ISR the cut line is at or above the level of the dentate line [4] Surgery was done after an

interval period of about 6-8 weeks after the end of chemoradiation allowing the maximum response of CCRT to be obtained. . Surgical procedures (ISR for the 10 ISR candidates after CCRT were performed according to the methods described by Schiessel and his colleagues [12,13].

4. RESULTS

Complications (intraoperative or postoperative).

5. DISCUSSION

There are four major intentions in the treatment of a patient with rectal cancer:

Local disease control, long-term survival ,saving of anal sphincter, bladder, sexual function. and improvement in quality of life. These intentions are best done through a multi-modality approach delivered by a multi-disciplinary team. Local excision is likely to be effective in-patients with a primary tumor which is limited to the sub mucosa (T1N0M0), without high-risk features (i.e., poorly differentiated, vascular and neural invasion) and in the absence of metastatic disease [14]. However, recent retrospective series with long-term follow-up suggest that even T1 rectal cancers without high-risk features have higher recurrence rates than expected [15]. Therefore, an increasing percentage of these patients are undergoing radical rectal resection. The decision to pursue a radical resection versus a local excision for an early staged rectal cancer is most difficult when the radical resection would require a permanent colostomy. Careful discussion of risks and benefits with the patient is particularly essential in this circumstance [15]. Gawad and his colleagues in the NCI conducted a study to compare both groups included in our study, the group which underwent APR and

Table 1. Complications in both groups

Complications		Operative technique		Total
		Sphincteric preserving technique	Abdomino-perineal resection	
Yes	Count	7	5	12
	% within operative technique	70.0%	50.0%	60.0%
	% of Total	35.0%	25.0%	60.0%
No	Count	3	5	8
	% within operative technique	30.0%	50.0%	40.0%
	% of Total	15.0%	25.0%	40.0%

Non-significant P value 0.388

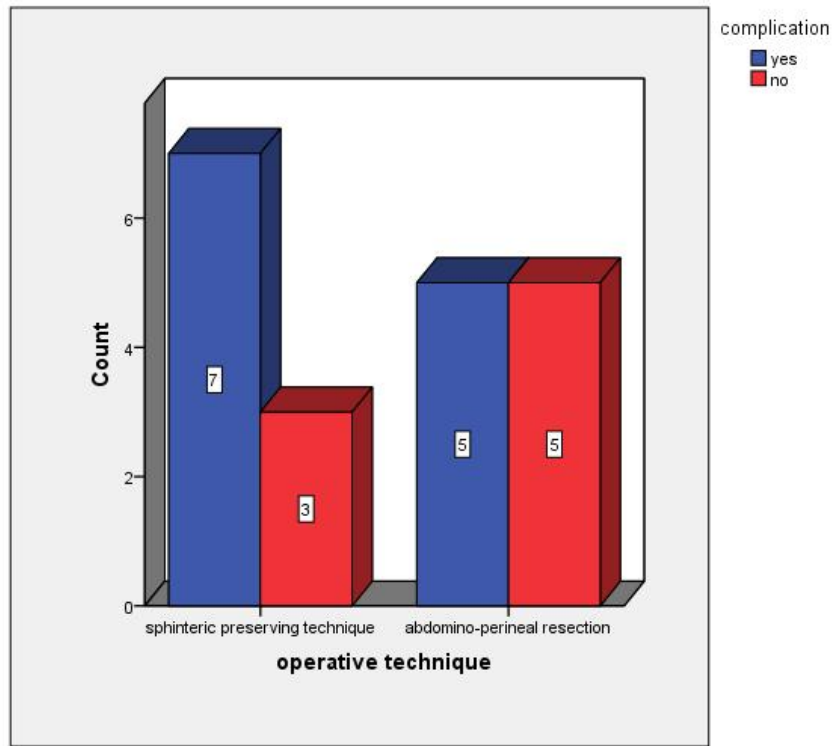


Fig. 1. Complications analysis of complications

Table 2. Analysis of complications

Type of complication	Operative technique	
	Sphincter preserving technique	Abdomino-perineal resection
Ileostomy congestion & stenosis	Count: 2 % within operative technique: 20%	Count: 0 % within operative technique: .0%
Wound infection	Count: 2 % within operative technique: 20%	Count: 2 % within operative technique: 20.0%
Dyspareunia & stenosis	Count: 1 % within operative technique: 10%	Count: 1 % within operative technique: 10.0%
Bleeding	Count: 1 % within operative technique: 10%	Count: 1 % within operative technique: 10.0%
Burst abdomen	Count: 1 % within operative technique: 10%	Count: 0 % within operative technique: .0%
Colostomy retraction	Count: 0 % within operative technique: .0%	Count: 1 % within operative technique: 10.0%

Non-significant P value 0.538

those who underwent sphincter saving procedures, the total number of the patients in their study was 111 patients. 50 patients out of them were operated upon using sphincter saving resection and the rest of the patients were operated upon using APR. Due to the fact of the high flow of the patients to the NCI and the long period of the study from 2003 to 2013), the number of

the cases is reasonable [16]. The stage and the type of the tumor was the main factor to determine the surgical technique used in surgery, in our study apart of mucinous carcinoma case, all cases were invasive adenocarcinoma in the stage TII and TIII. One case with stage 4 was included with liver metastasis in the left lobe which was resected together with APR.

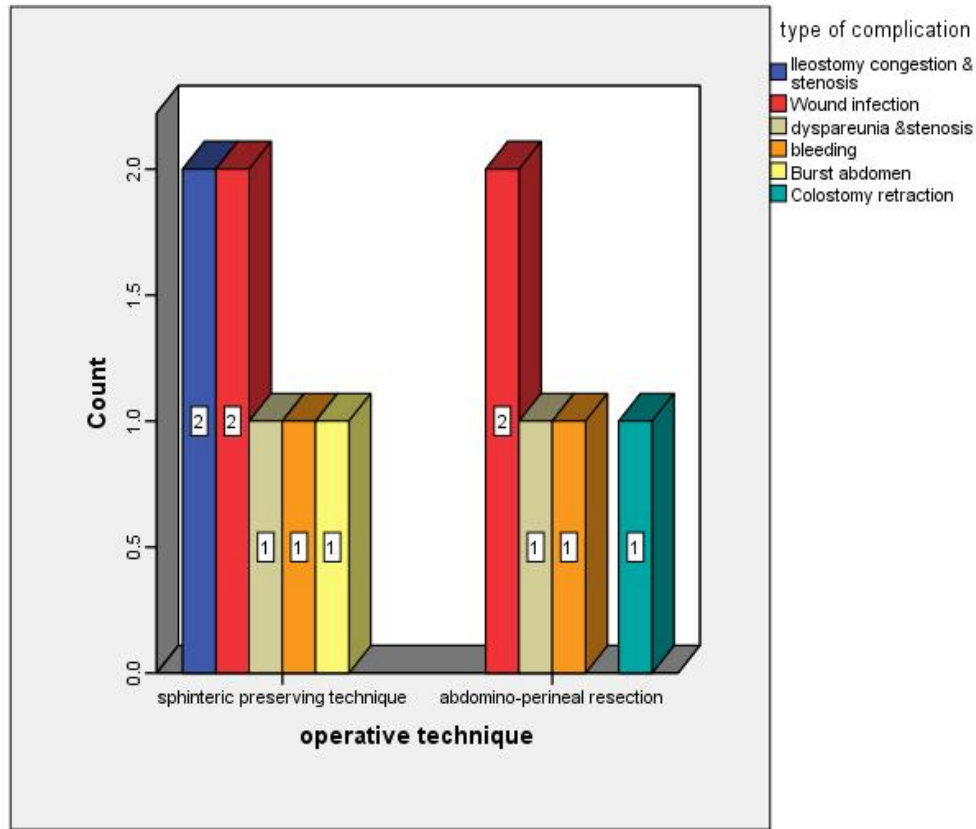


Fig. 2. Complication details in both groups

The ISR group included 7 cases staged TII and 3 cases staged TIII N0 M0, while APR group included 9 patients staged TIII N0 or N1 M0, and one case T4. When coming to data analysis, the stage of the tumor was a significant factor in determination of the surgical technique used in addition to the outcome of the surgery, the p value was 0.004. Gawad and his colleagues' study included 36 to 64% of patient with TII and TIII respectively for ISR group, and 38 to 62% respectively for APR group, which was insignificant. Their study did not include any T4 patients [16]. In our study, the rate of complication was reasonable in sight of the small sample size and the short period of the study. Overall the rate of complications in the ISR group of patients was higher from a statistical point of view, not taking into consideration the type of the complications which was not major in both groups. The main complication in ISR group was wound infection and was linked mainly to the comorbidity of the patients. Two diabetic patients underwent wound infection and one hepatic patient underwent burst

abdomen. Other non-major complications were noticed which were paralytic ileus, skin maceration after ileostomy, dyspareunia, stoma congestion and mild intraoperative bleeding. The continence outcome will be discussed later. On the other side, the APR group was less in complications which were mainly mild complications: Ileus, wound infection, dyspareunia, urinary tract infection. But one case witnessed severe malnutrition and was subjected to dietician after readmission with severe malnutrition. According to a study conducted on 75 patients by Bujko and his colleagues, the main complications reported were wound infection, chronic pelvic infection, sacral pain, and anastomotic leakage owing to fact that they did not do protective stoma as a routine [17,18].

6. CONCLUSION

In low rectal cancer, the sphincter saving appears to be feasible with little complications that worth the avoidance of APR permanent dysfunctions.

CONSENT AND ETHICAL APPROVAL

We got approval from the ethical committee in our faculty prior to start the study with a written informed consent from every patient.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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