# Quality of life after Abdominoperineal excision of the rectum vs intersphincteric resection in patients with low rectal malignancy

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**KEYWORDS**

Low rectal malignancy, Intersphincteric resection, abdominoperineal approach

**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 of the entire or part of the internal sphincter.
**Objectives:** is to evaluate the quality of life after surgery in patients with low rectal malignancy, the classic abdominoperineal resection (APR) compared to sphincter sparing (intersphincteric resection) (ISR) procedures.
**Methods:** This was an observational clinical study at Beni-Suef University hospital in Egypt for 6 months on patients diagnosed with low rectal malignant growth with clinical stages II (cT3-4, N0, M0) and III (cT1-4, N+, M0) based on histopathology. 20 patients were allocated in to 2 equal groups: ISR group (A) and APR group (B) according to operation technique. Intraoperative complications were recorded. The follow up of the patients was done every three months up to one year for post-operative complications and recurrence rate. Continence was evaluated in ISR group after 6 months using kirwan's grades.
**Results:** Overall the rate of complications in the ISR group was higher than APR group with no statistical significant difference. The follow up of the patients showed non-significant difference concerning recurrence rates between both groups. For the ISR group, 30% cases showed recurrence without distant metastasis, while 20% in the APR group showed local recurrence, one of them with distant metastasis. In ISR group after 6 months; 60% of patients were highly satisfied with Grade I continence according to Kirwan's grade, while 40% patients were Grade II.
**Conclusion:** In low rectal cancer, Patients with sphincter preservation have demonstrably shown enhanced functional results in terms of stoma avoidance and good continence.

## 1. Introduction:

Recent times have seen substantial progress in the management of rectal cancer. Two decades ago, the treatment of rectal cancer was solely a surgical endeavor. Today, it has transformed into a comprehensive approach to therapy. Ultimately, medical procedures are the cornerstone of therapeutic interventions **[1].**

Total mesorectal excision (TME) is a conventional technique for the precise removal of cancer. The advancement of the rectum has been pivotal, resulting in substantial enhancements in the management of this sickness **[2]**.

Although Miles' **[3]** abdominoperineal excision is considered the "highest quality level" for managing low rectal neoplasms, it necessitates a permanent colostomy. Restorative resection may now be feasible with comparable cancer control and survival rates **[4]**.

Researchers have investigated the feasibility of using advanced stapling methods and manual colo-anal anastomoses to achieve a closer connection between the gastrointestinal system and the anal region than is customary **[1]**.
Chemoradiotherapy has also enhanced local disease management **[5]** and, in few instances, has resulted in improved survival **[1]**.
Neoadjuvant therapy is administered concurrently. Chemoradiotherapy (CCRT) has become the primary treatment for locally advanced rectal adenocarcinomas. The clinical phases are II (cT3-4, N0, M0) and III (cT1-4, N+, M0). Neoadjuvant CCRT effectively reduces local recurrences. The rate of tumor down staging is rising. The frequency of sphincter-preserving surgical interventions and tumor respectability is increasing **[6]**.
In the 1980s, a distal boundary of 5 centimeters was mandated. The "2-cm rule" gained recognition in subsequent decades **[7]**. Researchers have evaluated this standard and now recommend a distal margin of 1 cm for optimal oncological results **[8]**. This indicates that rectal cancer patients possess an increased probability of sphincter preservation **[9].**
Recently, researchers have suggested intersphincteric resection (ISR) as a viable option to abdominoperineal resection (APR) for sphincter preservation in patients with low rectal injuries **[1]**.
The meticulous technique of intersphincteric resection for low rectal tumors expands the rectal resection into the intersphincteric area. This method employs a synchronous abdominoperineal approach that simultaneously excises the mesorectum and removes all or part of the internal sphincter **[7]**.
The use of the ISR approach is contingent upon the facts. Research indicates that rectal cancers infiltrate natural systems, including the rectum and the anal canal, and that an embryonic plane integrates these structures with the pelvic floor muscles. The objective is to remove the organ without damaging the skeletal muscles **[10].** Our research focused on comparing the traditional APR procedure with the contemporary SSR techniques throughout several treatment phases for this condition, emphasizing potential patient types, surgical outcomes, and complications.

## 2. Patients and methods:

### *2.1. Patients:*

This observational clinical study has been led at Beni-Suef University hospital at Beni-Suef University in Egypt. Every one of the patients went to the outpatient facility or alluded from the oncology bureau of the doctor's facility inside a half year and determined to have low rectal malignant growth (extraperitoneal) with clinical stages II (cT3-4, N0, M0) and III (cT1-4, N+, M0) "for example the individuals who expected to get neoadjuvant treatment "were evaluated by the accompanying incorporation and prohibition criteria.

**Inclusion criteria:**

1. Low rectal malignancy: distal tumor edge inside 3-6 cm from the anal verge.
2. Stage: II (cT3-4, N0, M0) and stage III (cT1-4, N+, M0).
3. Palatable preoperative sphincter capacity and self-control (emotionally: by specifically asking the patient.

**Exclusion criteria:**

1. Unsatisfactory preoperative sphincter capacity and self-restraint (abstractly: by straightforwardly asking the patient if he/she is incontinent to stool and/or flatus).
2. Disease stage: arrange I (cT1, N0, M0)

Patients were analyzed cautiously by digital rectal examination (DRE), unbending proctoscopy, and metastatic work up as: CT of the abdomen and chest and appropriately organized. All patients at first stagesd as III got neoadjuvant corresponding

Chemoradiotherapy (CCRT). Revaluation of the patients was done after the finish of neoadjuvant CCRT to distinguish the individuals who considered possibility for intersphincteric resection (ISR) versus the individuals who didn't, as per the accompanying referenced signs and contraindications of ISR.

*** Indications of ISR:**

1. Low rectal tumors: with distal tumor edge at a separation running from 3 to 6 cm from the anal verge
2. Local spread confined to rectal divider or internal anal sphincter (IAS) (for example T2).
3. Proper preoperative sphincter capacity and self-control.
4. No evidence of distant metastases.

*** Contraindications of ISR:**

1. T4 tumors
2. Unsatisfactory preoperative sphincter capacity and self-control.
3. Tumors attacking the external anal sphincter (EAS) (for example T3).
4. Tumors with distal edge from anal verge < 3cm.

Reexamination was [physiologically (self-restraint: abstractly by asking the patient as recently referenced), clinically (DRE and unbending proctoscopy), radiologically ( pelvic X-ray, metastatic work as: CT of the abdo and chest and bloods (CBC, coagulation profile, liver and kidney capacities).

As needs be, patients were ordered preoperatively as pursues:

Group A patients (10 patients): who meet the criteria of ISR plausibility and possibility for sphincter saving operations.

Group B patients (10 patients): who didn't meet the criteria referenced above to do ISR , and were exposed to APER

*2.2. Methods:*

2.2.1. Preoperative attending chemoradiotherapy (CCRT):

Radiotherapy: Radiotherapy was performed utilizing a 3D procedure, treatment volume incorporated the rectum, the entire mesorectum.

Chemotherapy: The preoperative attending chemotherapy was managed with radiotherapy.

2.2.2. Surgical Procedure:

a. ISR

Medical procedure was done after an interim time of around two months after the finish of chemoradiation permitting the most extreme reaction of CCRT to be achieved.

Surgeries (ISR for the 10 ISR group after CCRT were performed by the techniques described by **Schiessel** and his partners **[10]**.

The primary advances were as per the following:

1) Abdominal part while the patient was in the supine position:
   - Via a midline laparotomy entry point.
   - High ligation of the IMA and resection of the left colon.
   - Total mesorectal excision (TME), sharp dissection along the embryologic avascular plane between the mesorectal plane and the pelvic sidewall and protection of the hypogastric plexus nerves (opening of the pelvic peritoneum was in a plane between the mesorectum and the fascia of Waldeyer posteriorly and that of Denonvillier anteriorly).
   - Dissection down to the levator ani under direct vision. The rectum is to be dissected to the pelvic floor as low as conceivable to allow for the peranal part
2) Peranal part while the patient was in an Lloyd Davies position:
   - Wide retraction utilizing lone star retractor or rather stay sutures in the 4 corners with extra ones in the middle of if necessary.
   - Then bring down edge of the tumor was distinguished under direct vision.

- Circumferential entry point of the mucosa and interior anal sphincter was begun at 2 cm distal to the distal tumor edge.
- Dissection was proceeded by preparing the rectum proximally through the intersphincteric plane (i.e., between the interior sphincter and the outside sphincter).
- The inner sphincter is distinguished as a thin white structure and the outer sphincter as a thick red structure, with an avascular space between them.
- Once the intersphincteric space was entered, watchful dissection proceeded upward between the smooth and striated sphincters to meet with the pelvic dismemberment done through the stomach part.
- We for the most part relied upon the obvious lower tumor edge and ensured 2 cm distal safety edge and began our entry point, hence we had a) add up to: where we resected the IAS totally, b) subtotal: where we left a piece of the IAS. and c) incomplete: where we left a large portion of the IAS and totally with flawless dentate line.
- Removal of the rectum was done in combination with the internal sphincter per anally. All cases had a neurotic free distal edge.

Fig 1 : Exposure of anus

1. **Reconstruction of the bowel continuity:**

The decision whether a pouch was to be performed or not depended on the available length of colon and the volume of the mesenteric fat in relation to the capacity of the pelvis; Which was not performed therefore. Thereafter continuity was restored with a coloanal anastomosis. It is important to restore the anal canal and to avoid a mucosal prolapse. This was possible by putting the stitches first through the anal skin, then through the external sphincter and then through the full thickness of the colon. Before tightening the knots an exact adaptation of the mucosa to the skin was ensured. After the anastomosis was finished, the stay sutures were removed. Contraction of the sphincter was usually observed after removal of the stay sutures. Pelvic drains were inserted.

Fig. 2 : Delivery of the specimen and restoration of continuity

Fig. 3: After anastomosis

**2. The creation of a protective stoma:**

A temporary diverting stoma was made according to the patient general condition and doubtfulness about the anastomosis. It was done in all cases. Two to three months later the stoma was taken down after a normal double- contrast Barium enema study introduced through the stoma was obtained.

Fig. 4: Protective stoma

2.2.3. Postoperative care:

All patients started sphincter-fortifying activities two weeks after medical procedure by contracting and loosening up the outer anal sphincter for 30 minutes, four to six times each day). The utilization of building specialists and low fiber diet were prompted.

a. APER patients:

The abdominal part is done as referenced in the ISR group, yet the anal part we did wide careful extraction of the rectum after elliptical incision and excision of anus, finishing by an end colostomy.

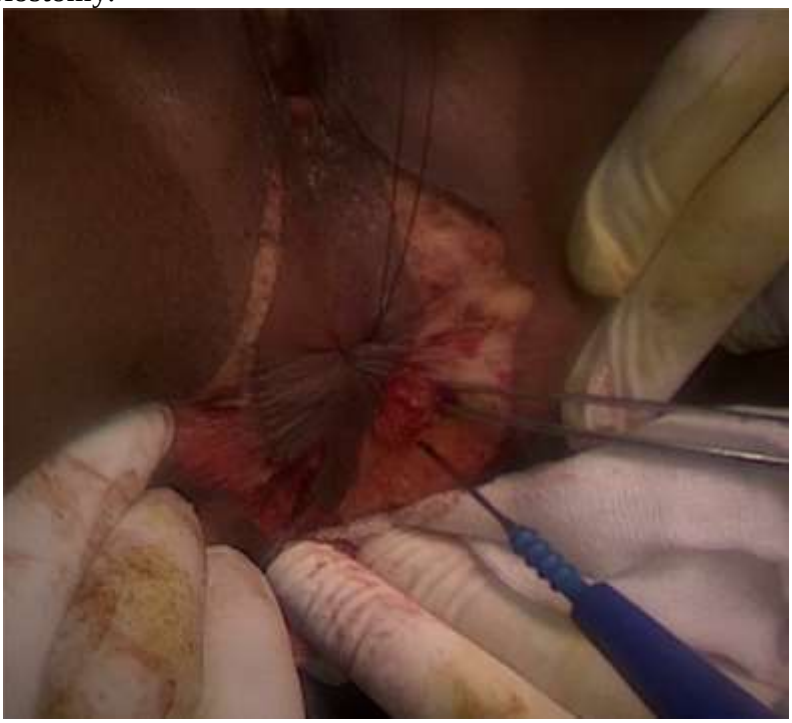

Fig. 5: Anus excision with wide ellipse

2.2.4. Pathology of the surgical specimen:

We followed the pathological reports of the surgical specimens for all the patients (whom underwent ISR or other types of surgery) to aid us in assessment of CCRT response and in the comparisons, we needed to asses the technique of ISR.

2.2.5. Postoperative chemotherapy:

Chemotherapy was given for a period that finishes a sum of a half year (the time of neoadjuvant treatment and that of the adjuvant treatment) which was commonly around four months or marginally somewhat more and was given as capecitabine and oxaliplatin.

2.2.6. Follow up:

Follow-up was carried out each month for the initial 6 postoperative months and afterward at regular intervals as far as possible of the investigation. In each visit: the patients experienced advanced rectal examination, research facility evaluation. Radiological examinations were done at regular intervals (liver ultrasound, chest x-beam). Incontinence results were surveyed by the characterization of **Kirwan and his associates [11]**. A questionnaire was done to the patients after reversal of the stoma was done.

Patients were gotten some information about:

a. The side effects of the front resection disorder:
   - Stool escape every day
   - Urgency (capacity to withhold stool over 15 minutes).
   - Stool frequency (multiple clearings in a single hour) .
   - Dyschezia (extending to clear or taking over 15 minutes to empty).
   - Nocturnal motions.
b. Feces and flatus segregation.
c. The self-control status as indicated by **Kirwan's [11]**: It has five evaluations as pursues:

I: perfect self-control.
II: incontinence of flatus.
III: intermittent minor dirtying.
IV: major real dirtying.
V: incontinence requiring colostomy

2.2.7. Outcomes:

- Primary outcomes: Patient quality of life and Continence.
- Secondary outcome: Recurrence

**2.3. Statistical analysis:**

The collected data were coded then entered and analyzed using the SPSS version 21 (Statistical package for social science) for windows 10.

The following tests were used:

* Descriptive analysis of the results in the form of percentage distribution for qualitative data and (minimum, maximum, mean and standard deviation) calculation for quantitative data.
* Cross tabulation and Chi Square test ($\chi 2$): For comparison between categorical variables and percentage values.
* Student t- test: For comparison between means of two unrelated groups with a normal distribution.
* P-values equal to or less than 0.05 were considered statistically significant.
* Simple graphs were used to illustrate some information.

**3. Results:**

In table (1): Ages of the patients included were from 21 to 69 years, and the age factor was found to be non- significant in both groups of the study.

**Table (1): Ages among participants**

| Age | N | Minimum | Maximum | Mean | Std. Deviation | P value |
|---|---|---|---|---|---|---|
| sphinteric preserving technique | 10 | 22 | 62 | 38.20 | 13.620 | 0.977 |
| (Valid N (listwise)) | 10 | | | | | |
| abdomino-perineal resection (Valid N (listwise)) | 10<br>10 | 21 | 69 | 38.40 | 16.998 | |

In table (2): The study included 7females and 13 males, who underwent either APER or Sphincter preserving procedures, and the sex factor was found non- significant as regard the outcome of the surgery

**In table (2): Sex distribution among study participants**

| | | | operative technique | | | P value |
|---|---|---|---|---|---|---|
| | | | sphinteric preserving technique | abdomino-perineal resection | Total | |
| sex | male | Count | 7 | 6 | 13 | |
| | | % within operative technique | 70.0% | 60.0% | 65.0% | 0.639 |
| | | % of Total | 35.0% | 30.0% | 65.0% | |
| | female | Count | 3 | 4 | 7 | |
| | | % within operative technique | 30.0% | 40.0% | 35.0% | |
| | | % of Total | 15.0% | 20.0% | 35.0% | |

In table (3): Type of the tumor effect on the outcome of the surgery was found to be non- significant.

**Table (3): Type of the tumor among study participants**

| type of tumor | | operative technique | | Total | P value |
|---|---|---|---|---|---|
| | | sphinteric preserving technique | abdomino-perineal resection | | |
| adenocarcinoma | Count | 9 | 10 | 19 | 0.305 |
| | % within operative technique | 90.0% | 100.0% | 95.0% | |
| | % of Total | 45.0% | 50.0% | 95.0% | |
| Mucinous carcinoma | Count | 1 | 0 | 1 | |
| | % within operative technique | 10.0% | .0% | 5.0% | |
| | % of Total | 5.0% | .0% | 5.0% | |

In table (4): Most patients who underwent abdomino-perineal resection had stage III malignancy, while stage II was prevalent in patients who had sphinteric preserving technique with statistical significant difference among groups.

**Table (4): Stage of the malignancy among study participants**

| | | | operative technique | | | P value |
|---|---|---|---|---|---|---|
| | | | sphinteric preserving technique | abdomino-perineal resection | Total | |
| stage | stage II | Count | 7 | 0 | 7 | 0.004* |
| | | % within operative technique | 70.0% | .0% | 35.0% | |
| | | % of Total | 35.0% | .0% | 35.0% | |
| | stage III | Count | 3 | 9 | 12 | |
| | | % within operative technique | 30.0% | 90.0% | 60.0% | |
| | | % of Total | 15.0% | 45.0% | 60.0% | |
| | stage IIII | Count | 0 | 1 | 1 | |
| | | % within operative technique | .0% | 10.0% | 5.0% | |
| | | % of Total | .0% | 5.0% | 5.0% | |

In table (5): Comorbidity factors and complications of surgeries were found to be non-significant.

**Table (5): Comorbidity factors and complications of surgeries among study participants**

| | | | operative technique | | Total | P value |
|---|---|---|---|---|---|---|
| | | | sphinteric preserving technique | abdomino-perineal resection | | |
| morbidity | yes | Count | 3 | 2 | 5 | 0.606 |
| | | % within operative technique | 30.0% | 20.0% | 25.0% | |
| | | % of Total | 15.0% | 10.0% | 25.0% | |
| | no | Count | 7 | 8 | 15 | |
| | | % within operative technique | 70.0% | 80.0% | 75.0% | |
| | | % of Total | 35.0% | 40.0% | 75.0% | |
| complication | yes | Count | 7 | 5 | 12 | 0.388 |
| | | % 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% | |

In figure (7): no statistical significant difference between groups regarding types of complications (P-value = 0.538).

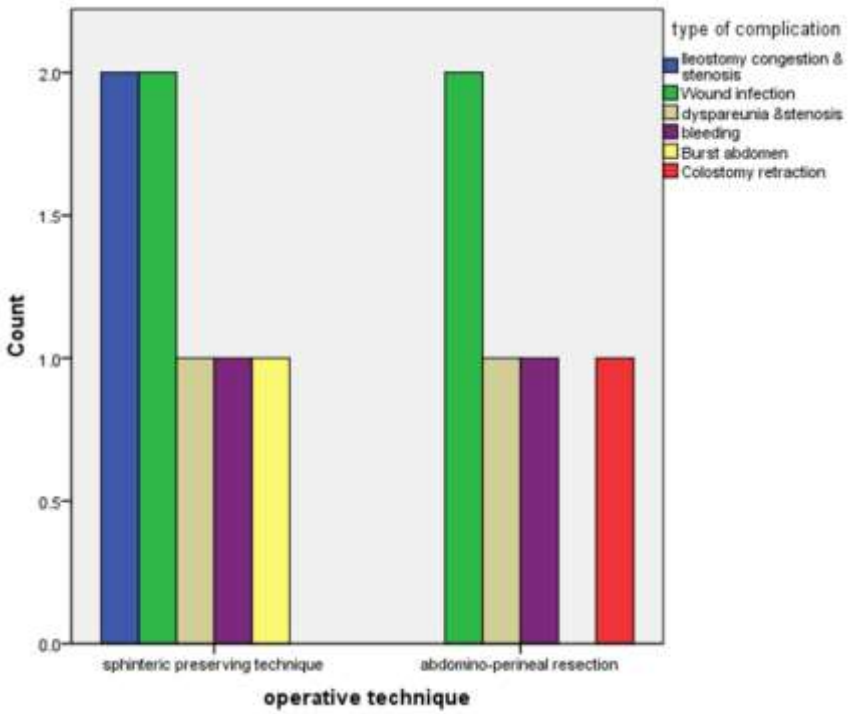


Fig.7: Type of complications in relation to the operation type

In figure (8): no statistical significant difference between groups regarding recurrence rate of malignancy after one year of follow up (P-value = 1). For the sphinteric preserving technique group, 3 cases showed recurrence during the 1st year follow up postoperative period without distant metastasis, while 7 patients did not witness recurrence during this period. On the other side 2 out of 10 patients of the abdomino-perineal resection group showed local recurrence, one of them with distant metastasis.

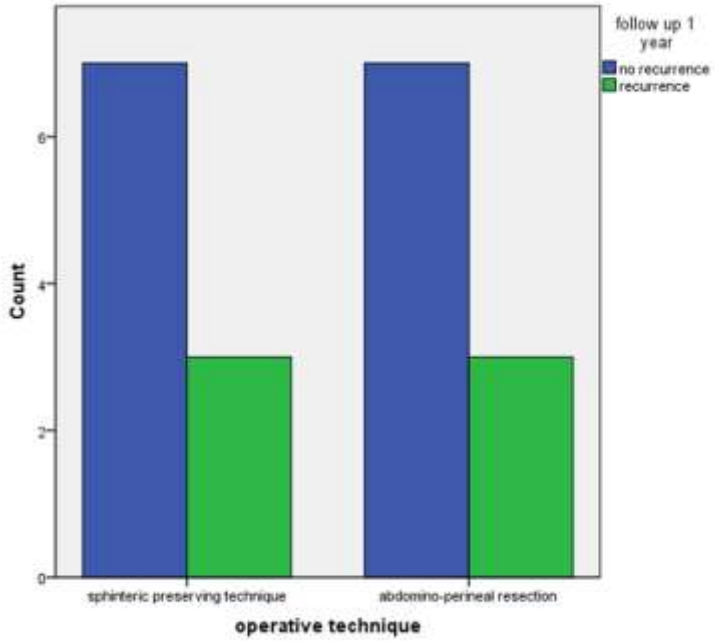


Fig.8: Recurrence rate among both groups

In table (6): after 6 months, out of 10 patients underwent ISR, 6 patients were highly satisfied with Grade I continence according to Kirwan's grade **[11]**. While 4 patients were Grade II, i.e.: Incontinent to flatus.

**Table (6): Continence grade after 6 months follow up in ISR according to kirwan's [11]**.

| | | Frequency | Percent | Valid percent |
|---|---|---|---|---|
| Valid | Grade 1 | 6 | 30. | 40. |
| | Grade 2 | 4 | 20. | 60. |
| | Total | 10 | 50. | 100. |

**4. Discussion:**

The advancement of surgical procedures, along with CCRT, has facilitated sphincter preservation for a greater number of patients with low rectal cancer **[12]**. Our research intended to evaluate the oncological and functional outcomes in individuals with low rectal cancer who had ISR vs. those who received APR. Total mesorectal excision was essential in both groups, along with the accurate determination of a free circumferential resection margin.

**Gawad and his colleagues [13]** indicated in their research that the oncological and functional results of SSR were significantly altered by the acknowledgment of the significance of circumferential margin involvement. Upon the discovery that cancer first disseminates laterally into the mesorectum, the primary surgical approach for mid and low rectal malignancies became complete mesorectal excision. Thus, patients with extremely low-lying rectal tumors who react to preoperative chemoradiation may have an advanced sphincter-sparing operation rather than abdominoperineal resection, achieving good oncologic and functional outcomes.

In our study, a total of 20 patients were selected according to clinical and radiological criteria consistent with the inclusion criteria mentioned above. Subsequently the decision of inclusion the patients into one of the two subgroups were according MRI findings which showed the sphincter complex state. The small sample size which is 20 patients is considered a reasonable number when taking into consideration the short period of the study and the flow of the patients who have the mentioned criteria. Due to lack of the screening programs and early diagnosis centers, many patients with rectal cancer come having already distant metastasis and incompatible with the inclusion criteria of our study.

**Di Bietta and his colleagues [14]** conducted a study comparing both groups, they analyzed the results of 43 studies that were conducted including 6750 patients since 1990, however their study included 50 patients who had the accepted inclusion criteria**.**

**Khalil and his colleagues [15]** in NCI conducted another study to compare both groups, the total number of the patients was 79 (43 ssp , and 36 APR ) , in a period of 5 years .

Many factors were taken into consideration during management of the cases and analysis of the results of our study, these factors included the age, sex , stage and type of the tumor , operative technique , intra and postoperative long term and short term complications and local or distant recurrence .

In our study, when talking about the age and sex of the included patients, the data analysis showed insignificant p value as regard these two factors. For the ages of the patients, the ISR group's youngest patient was 22, and the oldest was 62 years old, with the mean age 38.2 yrs. APR group of patients ages were almost the same, with youngest and oldest patients were 21 and 69 respectively, the mean age of this group was 38.4. In comparison the p value proved to be insignificant.

In **Gawad and his colleagues's** study **[13]**, The mean ages of the patients of both groups were 48.4 for ISR group and 48 for APR group , with insignificant p value also .The sex of the patients according to their study was insignificant factor as regard data analysis; the male to female ration in their study was 3:1.

In our study, the number of females who underwent ISR was 3, and those who underwent APR were 4. While the male patients who underwent ISR were 7 compared

to 6 who underwent APR. The male to female ratio in our study was almost 2:1 with insignificant p value.

**Gawad and his colleagues [13]** conducted a study to compare groups included in our study, the group which underwent APR and 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 using sphincter saving resection and the rest of the patients were operated 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.

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.

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' [13]** 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.

In our study, the rate of complication was reasonable due to the small sample size and the short period of the study. Overall the rate of complications in the ISR group pf 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, and 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 [16]**, 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**.**

The main aim of the ISR technique is to provide a better quality of life keeping the patient continent compared to the permanent stoma in APR.

Assessment of the continence after ISR was done using Kirwan's grade mentioned above **[11]** , and the results showed that after 6 months, out of 10 patients underwent ISR , 6 patients were highly satisfied with Grade I continence according to Kirwan's grade **[11]** . While 4 patients were Grade II, i.e.: Incontinent to flatus. This result was not the same during the first 5 months owing to the presence of protective stoma which was usually closed within three months maximalluy and the patients needed a period for physiotherapy to regain their anal sphincter function.

In **Gawad and his colleagues'** study **[13]**, 70 %of patients were kirwan's **[11]** grade one, 20% were Grade II, while 10 % were Grade 4 with frequent major soiling. The above mentioned results were obtained after 12 months post stoma closure.

Another subjective study conducted by **Bujko and his colleagues [16]** which included 100 patients after ISR who subjected into a questionnaire about the continence , anal

stenosis , the need to use enema , feeling of incomplete defecation and the overall life quality reduction due to incontinence , the results should that that 44 % were highly satisfied with their life style after the operation , 38% reported slight reduction in their quality of life , while 18% reported a" very much reduction "in their quality of life according to their own words**.**

In our study, the follow up of the patients that was done every three months up to one year showed non significant recurrence rates between both groups of the study. For the ISR group, 3 cases showed recurrence during the 1st year follow up postoperative period without distant mets, while 7 patients did not witness recurrence during this period. On the other side 2 out of 10 patients of the APR group showed local recurrence, one of them with distant mets . Our statistical data analysis showed insignificant p value.

**Gawad and his colleagues [13]** stated in their study that the recurrence rate of both compared group was also statistically insignificant (p = 0.107, and 0.948, for ISR and APR groups respectively).

The limitations of this study may be attributed to the restricted sample size and short follow-up period. The primary tumor biology (stage, histologic grade, and lymphovascular invasion), was not examined in this study, may possibly influence this outcome.

**5. Conclusion:**

In low rectal cancer, sphincter preservation exhibits oncologic results similar to abdominoperineal resection. Patients with sphincter preservation have demonstrably shown enhanced functional results in terms of stoma avoidance and good continence.

**6. Conflict of interest:**

None

**7. Author contribution:**

**Mohamed Amin:** data collection, analysis and writing. ***Mohamed Salama*:** data analysis and writing. **Ahmed saad Ahmed:** supervision. All authors revise and approve the final manuscript

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