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Research Article

Ultra-Low Hartmann's Versus Intersphincteric Abdominal Perineal Resection in Distal Rectal Cancers- A Single Centre Review

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Abstract

Introduction: Patients with distal rectal cancer with predicted poor functional outcome for primary anastomosis, there are two proposed non-restorative surgical management include Ultra Low Hartmann's (ULH) and Intersphincteric abdominal perineal resection (IAPR). The aim of this study is to compare short term postoperative morbidity and mortality between the two groups.

Methods: Patients who either had a ULH or an IAPR between 2013-2019 in a single centre were included in this retrospective cohort study. Follow-up for 30 days was performed and data was collected and analysed.

Results: A total of 54 patients were included in the study, 14 in the ULH group and 40 in the IAPR group. There was no difference in age between the groups however the ULH had more patients with comorbidities and higher ASA scores compared to the IAPR group. ULH resulted in more severe complications 14% compared to IAPR with 2.5% (p=0.18). three out of 14 patients (21%) in the ULH group develop a pelvic collection compared to one out of 40 (2.5%) in the IAPR group (p=0.01). Reintervention were performed in 2 patients in the ULH group (14%) compared to 5 patients in the IAPR group (12.5%) p=0.24. The readmission rate was 14% in the ULH group and 27.5% in the IAPR group (p=0.73).

Conclusion: The results from the study suggest that IAPR can be considered an alternative to ULH in patients with low rectal cancer given that ULH was associated with a higher rate of pelvic abscesses and reoperation.

Keywords: Ultra-low hartmann's; Intersphinteric abdominal perineal resection; Rectal cancer; Surgical options; Complications

1. Introduction

The surgical treatment of distal rectal cancer which does not involve the sphincter complex or pelvic floor is total mesorectal excision (TME) with or without restoration of continuity. Surgical treatment for very low rectal cancer is very difficult because of the higher rate of local recurrence (LR) and lower rate of survival. A large majority of patients experience long term symptoms and decrease quality of life: Low anterior resection syndrome (LARS). Ultra-low hartmann's (ULH) versus intersphincteric Abdominal perineal resection (IAPR) with resection of the rectal stump and end colostomy has been proposed as an alternative to this [1].

ULH Considered a safe operation with low major complication rates and mortality. The rational being that there is a short ano-rectal stump resulting in less problems with secretion and bleeding. In recent times, there has also been an increase in number of patients undergoing procedure with about 30% in patients with metastasis. Some of the complications from this procedure include pelvic abscess with rates of 12-33% and Fistula with rates of 10-20 [2]. It has been described that the problem with blood supply to rectal stump or surgical technique could increase incidents of pelvic abscess. Pelvic abscess can be difficult to manage with management ranging from return to theatre versus radiological drainage. There is also the issue with reversal with reversal rates of <50% and with complications from the reversal ranging about 20% [3].

IAPR on the other hand avoids leaving a suture line on the rectal stump in the pelvis. This results in no risk of stump blow-out. However, the complications in this procedure are different and include perineal wound infection or necrosis. The rates of which ranges from 15-38% with higher rates after neoadjuvant radiotherapy [4]. In most centres, it is easier to perform compared to ULH given difficulty in surgery that comes with the ULH with regards to using the stapler devices on the shorter ano-rectal stump.

Some of the rationales of the study include questions like which procedure is better for patients. At present time, it is unclear as no large cohort of patients included in studies and most published papers have been retrospective. The intention of this paper is to compare patients between ULH and IAPR to investigate which method gives the lowest post-operative morbidity and is associated with the best quality of life.

2. Method

We evaluate patients in the Flinders Medical Centre Colorectal Department retrospectively who underwent either an ULH or an IAPR from 2013-2019 using the hospital systems electronic database. The primary objective of this study is to observe the rate of local surgical complications (as graded by the Clavien-Dindo scale) within 30 days [5]. Secondary endpoint include: Post-operative length of hospital stay, re-admission frequency, re-operation and re-intervention (eg,

percutaneous and transanal drainage) rate, late local complications from the perineum or ano-rectal area within 1 year follow-up. Data was prospectively collected from the unit's database. Approval from the institutional ethics board was obtained. All patients, 18 years or older, who underwent surgery for rectal cancer either based on initial biopsy or intraoperatively with tumour within 5cm of the anorectal junction. Total mesorectal excision (TME) was performed in all cases. ULH consist of an oncological resection with the creation of an end colostomy and a stapled rectal remnant. IAPR is performed with dissection of the intersphinteric plane, preservinf the external sphinter with closure of the perineal region with layered suturing.

The Chi^2-test was used for comparison of frequency distributions and the Mann–Whitney U test was used for the nonparametric variables. Data were analyzed using GraphPad Prism Version 8 (GraphPad software Inc., San Diego, CA, USA) and SPSS version 26 (SPSS Inc., Chicago, IL, USA). A significant difference was assumed for a probability value of <0.05.

3. Definitions

Pelvic abscess is defined as fluid/pus collection in the pelvic cavity or a clinical/endoscopic defect in the suture line that is diagnosed via a computer tomography (CT) scan. Perineal wound complications include perineal dehiscence or necrosis.

4. Results

A total of 53 patients was included in this study with 14 patients (26%) having undergone an ULH and 39 patients (74%) undergoing an IAPR during the study period in elective setting. There were more male patients in both group with 85% in the ULH group and 62.5% in the IAPR group. Both groups had similar distribution of age of patients with a median of 69 years in the ULH group and 62 years in the IAPR. There was a higher rate of comorbidities in the ULH group compared to the IAPR group with all patients in the ULH having at least one comorbidity while 42.5% of patients in the IAPR group had comorbidities. We also found a higher ASA score for the ULH group. 62.5% of patients in the IAPR group had pre-operative chemoradiotherapy compared to none in the ULH group. 92.5% of patients in the IAPR group had pelvic drains inserted compared to 64% in the ULH group. We noted that patient in the IAPR group had significantly longer operative time with an average of 560mins compared to patients in the ULH group with an average of 315mins ($p<0.001$). Patients who underwent IAPR had longer hospital stays with a median of 18 days compared to 15 days in the ULH group ($p=0.750$. Baseline characteristics are described in Table 1.

	Ultra-low hartmann's (ULH) n=14	**Intersphinteric abdominal perineal resection (IAPR)** N= 40	**P-value**
Gender (%)			
Male	12(86)	25(62.5)	0.34
Female	2(14)	15(37.5)	
Age in years, median (range)	69 (58-87)	62 (34-87)	0.27
Number of comorbidities per patient (%)			
0	-	23(57.5)	0.35
1	5 (35.5)	6(15)	
2	8(57.5)	8(20)	
>2	1(7)	3(7.5)	
ASA score (%)			
1	-	14(35)	0.56
2	3(21)	-	
3	8(58)	24(60)	
4	3(21)	2(5)	
Duration of surgery, Minutes	315	560	<0.001
Pre-operative chemoradiotherapy (%)			-
Yes	-	25(62.5)	
No	14(100)	15(37.5)	
Pelvic drain (%)	9(64)	37(92.5)	0.21
Length of stay, median (days)	15	18	0.75

Table 1: Patient demographics.

There were almost similar total complication rate post operatively between the group with 11 patients (78.5%) in the ULH group and 29 patients (72.5%) in the IAPR group (p= 0.18). However, the ULH group had more severe complication with 2 patients (14%) having grade 4 complications and 1 death compared to the IAPR with only 2.5% of patients with grade 4 complication. 3 patients (21%) in the ULH group

developed pelvic abscess compared to 1 patient (2.5%) in the IAPR group (p<0.01). The single patient in the IAPR group required CT guided drainage of the pelvic collection, 2 patients from the ULH group required a return to theatre for a wash-out and drain insertion and one was managed with CT guided drainage. There were 2 patients (14%) in the ULH required a return to theater while 5 patients (12.5%) from the IAPR group required a return to theatre, two of which was for issues with their perineal wound flaps, two for a perineal wound breakdown, and one from a seroma. There were 12 patients (30%) in the IAPR group developed perineal complications. In terms of minor complications, 3 patients (21%) in the ULH group developed abdominal wound complications compared to 3 patients (7.5%) in the IAPR group. We also saw 2 patients readmit within 30 days in the ULH group compared to 11 patients (27.5%) in the IAPR group. Post-operative outcomes and complications are described in table 2.

	Ultra-low hartmann's (ULH) n=14	**Intersphinteric abdominal perineal resection (IAPR)** N= 40	**P-value**
Complication (%) Yes No	 11(78.5) 3(21.5)	 29(72.5) 11(27.5)	 0.18
Complications grade (%) 1 2 3 4 5	 - 8(57) - 2(14) 1(7)	 5(12.5) 18(45) 5(12.5) 1(2.5) -	 0.18
Pelvic abscess/Pelvic collection (%)	3(21)	1(2.5)	0.01
Return to theatre (%)	2(14)	5(12.5)	0.24
Abdominal wound complication (%)	3(21)	3(7.5)	0.38
Perineal wound complication (%)	-	12(30)	-
Readmission in 30 days (%)	2(14)	11(27.5)	0.73

Table 2: Post-operative outcomes and complications.

5. Discussion

This single center retrospective cohort study showed that there was no significant difference in major complication rates (Clavien-dindo classification 3 or higher) between the groups (p= 0.18) There was however a significant difference in rates of pelvic abscess between the group with the ULH being more likely to develop pelvic collections. (p<0.01) There is a greater variability in literature with respect to the rates of pelvic sepsis after both ULH and IAPR. Sverrisson et al. reported a rate of only 3% in patients that underwent ULH [6]. Tøttrup et al. found that ULH was associated with a pelvic abscess rate of 19% which was higher in the group with a shorter rectal stump [7]. Frye et al. found a pelvic abscess rate of 17% in the ULH group. [4] In another study, the rate was recorded as 12% [8]. In our study, the rate was recorded as 21% in the ULH group. Some of the reason that have been considered for this variability could potentially be related to the rectal stump length, however in our study, we could not evaluate the length of the stump reliably.

IAPR has been proposed as an alternative to ULH as it avoids the risk of leakage from the rectal stump. However, studies have shown high incidence of infection in the pelvis with both techniques and did not show a superiority in either one [9]. In comparison to the normal Abdominal perineal resection (APR), IAPR has the potential to reduce the perineal wound complications by preserving the external sphincter and pelvic floor [10].

In our center, ULH is usually performed in patients with cancer free sphincters and contraindications for a colorectal anastomosis because of comorbidities, advanced age, high ASA score or low rectal cancer with extended metastatic disease [11]. Because of the non- randomization between the groups, we saw that the patients who had ULH were more comorbid and older compared to the IAPR group.

In current practice, IAPR has always been considered a procedure with longer operative time and higher morbidity compared to ULH. We found that to be the case with IAPR taking significantly longer (p<0.001) compared to ULH. The reasons are multifactorial, IAPR is a more complicated technique with both an abdominal and perineal phase, comparatively, ULH has only an abdominal phase [12]. In some centers, surgeons prefer to have their patients in a prone position which requires additional time [13].

IAPR however did result in longer hospital stay although not clinically significant, this could potentially cause a significant delay in the patients receiving adjuvant chemotherapy. The complications that result from both surgery also carries this potential for delays of adjuvant therapy. A longer period of follow-up beyond the scope of 30 days post-operatively is necessary when assessing complications of surgery, particularly with pelvic surgery, since there is more clinical complexity resulting in multiple reintervention and readmission over a longer period of time. In literature, patients particularly those that have had neoadjuvant radiotherapy are at higher risk of pelvic collections and delayed wound healing [14].

Some of the limiting factor in this study is that it is a retrospective study, which can result in incomplete data. The sample size for the ULH group was small given the case load in one center resulting in reduced power to find significant difference between the groups. There is limited data at present regarding this comparison and our study will help better understand

that relationship and pave the way for future prospective study.

6. Conclusion

Our study shows that in patients with low rectal cancer without sphincter involvement and who are unsuitable for anastomosis, IAPR can be considered a valid option to ULH. The lower rates of complication and better post-operative outcome seem to favor the former of the two options. Further multicenter randomized control trials are necessary to assess the suitable of this in the long term.

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