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Quality of Life after Emergency Hartmann's Procedure: A Single Centre Retrospective Study

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Abstract

Background: Hartmann's Procedure (HP) is the resection of the recto-sigmoid colon and creation of an end colostomy. Quality of Life (QoL) is increasingly considered before surgical intervention. This study assesses the patient's perspective (QoL) before the HP, while the stoma is present and after reversal.

Methods: Considered were patients who underwent emergency HP at our institution, between March 2014 and September 2017. The World Health Organization quality of life abbreviated questionnaire (WHOQOL-BREF) was used. An invitation letter and a copy of the questionnaire were sent to the patients, followed by a phone interview.

Each patient completed the same questionnaire in relation to three time periods: Before Hartmann's HP (BH), after Hartmann's HP with Stoma Present (SP) and after Stoma Reversal (SR). Twice or 3 times, if the stoma was not reversed or was reversed.

Results: Eighty-seven patients underwent emergency HP; 38 (43.7%) participated in the study. Fourteen (36.8%) patients had their stomas reversed.

No difference in Qol, satisfaction with health, physical health, social relationships and environment between the periods BH *vs.* SP and BH *vs.* SR. There was an improvement from SP to SR.

Psychological health scores were worse from BH to SP, but better from the SP to SR periods.

Complications were the only predictor of outcome, except in psychological health and only after reversal of stoma.

Conclusion: Emergency HP does not lower the general QoL but has a negative impact on psychological health. Stoma reversal engenders positive changes in QoL perception, while morbidity after stoma reversal predicts poorer outcomes.

Keywords: Emergency; Hartmann's Procedure; Quality of Life; Patients Experience; Predictors

Novel Aspects

1. Assesses patients own perception.

2. Assess quality of life over three periods in the same patient and not compared to other patients that had a different procedure as in previous studies.

3. Looks for predictors of quality of life in these patients.

Introduction

Hartmann's Procedure (HP) consists of the resection of the recto-sigmoid colon and the creation of an end colostomy. It was first described by Henri Albert Hartmann in 1921, following the high mortality associated with abdominoperineal resection described by Miles in 1908 [1].

It was initially described for the elective treatment of complicated recto-sigmoid cancer, but now mostly performed in the emergency setting to treat a variety of pathologies including perforated diverticulitis, traumatic perforations, volvulus, inflammatory colitis, postoperative anastomotic leaks and stercoral perforations [2,3]. With complicated diverticulitis followed by rectosigmoid cancer representing the most common indications for it [1,3].

The main advantage of HP is the immediate resection of the pathological bowel segment while

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Table 1: WHOQOL-BREF Domains. The WHOQOL group, program on mental health, WHO, CH-1211 Geneva 27, Switzerland.

Domain	Facets incorporated within domains
1. Physical health	Activities of daily living Dependence on medicinal substances and medical aids energy and fatigue Mobility Pain and discomfort Sleep and rest Work Capacity
2. Psychological	Bodily image and appearance Negative feelings Positive feelings Self-esteem Spirituality/Religion/Personal beliefs Thinking, learning, memory and concentration
3. Social relationships	Personal relationships Social support Sexual activity
4. Environment	Financial resources Freedom, physical safety and security Health and social care: accessibility and quality Home environment Opportunities for acquiring new information and skills Participation in and opportunities for recreation / leisure activities Physical environment (pollution/noise/traffic/climate) Transport

avoiding the potential complications of a colorectal anastomosis [4]. Its disadvantages include the presence of a stoma and a low reversal rate [2,3,5].

Quality of Life (QoL) after treatment, defined as a state of well-being composed of the ability to perform everyday activities and patient satisfaction with levels of functioning together with satisfactory disease and symptom control [6], is increasingly regarded as an important factor in determining surgical outcomes and considered before surgical intervention [6,7].

This study attempts to assess the patient's perspective (QoL) before the HP, while the stoma is present and after reversal.

Aims

This study aims to quantify QoL changes with emergency HP. Primary objective is the comparison of patients' well-being before and after surgery (HP); with the stoma in situ and after reversal of stoma. Secondary objective is to identify potential predictors of QoL outcomes.

Methods

Local board approval was obtained. All the patients who underwent emergency HP at the Royal Devon and Exeter NHS Foundation Trust, United Kingdom, between March 2014 and September 2017, were considered for the study.

Inclusion criteria were age of 18 yrs and above, exclusion criteria were inability or unwillingness to take part to the study and elective surgery.

Patients were identified via the local National Emergency Laparotomy Audit (NELA) database [8].

The World Health Organization quality of life abbreviated questionnaire (WHOQOL-BREF) was used [9]; it is a non-disease specific survey that can be applied to a variety of clinical conditions [9], reflecting patients' experience and allowing an accurate measurement of their QoL [10].

All communications with the patients were vetted by the trust Governance department.

The questionnaire consists of 26 questions on a 5-point Likert scale. Questions 1 and 2 assess directly patients' perception of their general QoL and satisfaction with their health, while the remaining questions assess 4 domains – physical health, psychological health, social relationships and environment (Table 1).

The interview was conducted by phone, but prior to that, an invitation letter and a copy of the questionnaire were sent to the patients a week or two before the interview to allow them get familiar with the survey questions and format.

In order to assess participants' QoL perception before and after surgery, each patient answered the same questionnaire in relation to three time periods: Before Hartmann's HP (BH), after Hartmann's HP with stoma in situ or present (SP) and after Stoma Reversal (SR). Therefore the questionnaire was administered twice to patients who still had their stoma at the time of the survey, and three times to those who had undergone stoma reversal.

The scores obtained were then imputed on an Excel spread sheet. The domain scores were computed and the raw domain scores transformed according to the WHOQOL-BREF domain score transforming tables using the 0 to 100 transforming tables.

Statistical analysis

Statistical analysis was performed using R (2020) R Foundation for Statistical Computing, Vienna, Austria.

Categorical variables were compared using the Pearsons chi-square test and means by the student's t test.

Scores were compared using the Friedmans test and the Wilcoxon post-hoc Friedman test to compare the paired samples.

Predictors were searched for using the brms package and using a Bayesian multivariate linear regression analysis of variance and using a non-informative prior. Statistical significance was set at $p \leq 0.05$.

Results

Demographics

Eighty-seven patients had HP over this period and 60 were alive at the time of study. Thirty-eight patients participated in the study giving us a response rate of 63%. There was no difference in age (p=0.58) and sex (p=0.34) between responders and non-responders. Only 14 patients (36.8%) had their stomas reversed. Males were 18 (47.4%) and the median age of responders at surgery was 68 years (range 34 to 86 years), while median duration from HP to study was 50 months. All responders indicated white British as their ethnicity. Of the 22 patients that did not participate, 9 could not be contacted, 2 had dementia, 2 had severe hearing difficulties and 9 declined to participate.

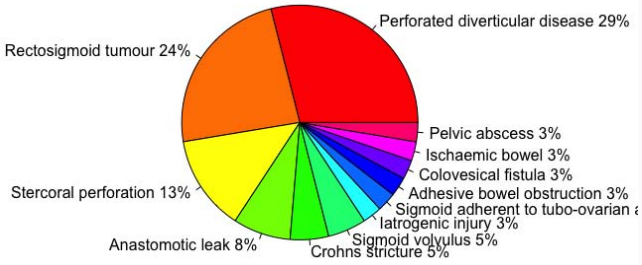

Figure 1: Indications for surgery.

Perforated sigmoid diverticulitis was the main indication of surgery, followed by obstructing recto-sigmoid cancer (Figure 1).

Quality of Life

In question 1, patients were asked to rate their quality of life for the period before the Hartman's procedure (BH), the period after the Hartmann's procedure with the Stoma Present (SP) and the period after the stoma had been reversed (SR).

The only significant difference was with higher median scores in the SR period compared with SP period. P-value 0.007 (Table 2).

Indicating a better score and a more favorable view of their quality of life only after the stoma had been reversed.

No difference was noted in QoL scores between those who had never been reversed and those that were reversed while they were still in the SP period with P=0.84.

No difference was also noted in QoL scores between those who had cancer and those that had benign disease while they were still in the SP period with p=0.90.

Satisfaction with your health

The same finding was noted with question 2 which explored how satisfied the patients were with their health. Median scores were again noted to be higher in SR period compared to SP period. P-value 0.011 (Table 2). This also indicated a better score and a better satisfaction with their health after the stoma had been reversed.

Table 3 shows the median scores for each period for each domain and the p-values on comparing the different periods.

Domain 1 – Physical health

In domain 1 which assessed the physical health of the patient, no significant difference was noted in the median scores between BH *vs.* SP and BH *vs.* SR but was noted with SP *vs.* SR with a p-value of 0.027. This suggested an improvement in physical health with reversal of the stoma.

Domain 2 – Psychological health

In domain 2 which assessed the psychological health of the patients, a significant difference was noted in the median scores between BH *vs.* SP with a p-value of 0.005. The smaller median score of the SP period indicated a worse psychological health of the patient over the period.

There was also a significant difference between the SP *vs.* SR periods with a p-value of 0.0076. Indicating a better psychological health after the stoma was reversed compared to when it was present (Table 3).

Domain 3 – Social relationships

Domain 3 assessed the social relationships. There was a significant difference only when SP was compared to SR. The difference in median scores was significant with a p-value of 0.015. There was therefore no difference in social relationships between BH *vs.* SP or BH *vs.* SR (Table 3).

Domain 4 – Patients environment

Domain 4 assessed the patient's environment. Again, there was no difference in social relationships and environment between BH *vs.* SP or BH *vs.* SR. There was a significant difference between SP *vs.* SR with a p-value of 0.0048 (Table 3).

Outcome predictors

Across all the domains except domain 2, complications', was the only predictor of outcome and only after reversal of the stoma (Table 4).

Discussion

Hartmann's Procedure HP is a well-established mode of management of upper rectal and distal sigmoid pathologies [2]. It is a life-saving procedure when a primary anastomosis is contraindicated [2].

Quality of Life (QoL) after surgery is increasingly considered an

Table 2: Perception of QoL and Satisfaction with health scores.

	Before HP BH (Median)	After HP (stoma present) SP (Median)	After stoma reversal SR (Median)	P-value BH *vs.* SP	P-value BH *vs.* SR	P-value SP *vs.* SR
Q1. How would you rate your quality of life	4	4	5	0.35	0.15	0.007
Q2. How satisfied are you with your health	4	3.5	5	0.10	0.058	0.011

QoL: Quality of life; HP: Hartmann's procedure; Q: Question

Table 3: Domain scores.

Domains	Before HP BH (Median)	After HP (stoma present) SP (Median)	After stoma reversal SR (Median)	P-value BH *vs.* SP	P-value BH *vs.* SR	P-value SP *vs.* SR
Domain1 Physical health	75	69	88	0.33	0.075	0.027
Domain2 Psychological	69	63	72	0.005	0.959	0.0076
Domain3 Social relationships	81	75	94	0.055	0.26	0.015
Domain4 Environment	81	75	88	0.17	0.065	0.0048

HP: Hartmann's Procedure

Table 4: Bayesian Multivariate linear regression with 3 outcomes to determine predictors.

	Predictor	Outcome	Estimate	Est. Error	L 95% CI	U 95% CI
Q1 How would you rate your quality of life	Complications	BH	-0.79	2.23	-5.13	3.46
		SP	-1.88	1.33	-4.43	0.83
		SR	-1.48	0.57	-2.59	-0.25
Q2 How satisfied are you with your health	Complications	BH	-0.05	1.69	-3.24	3.51
		SP	-1.30	1.34	-3.73	1.27
		SR	-1.03	0.52	-2.04	-0.04
Domain 1 Physical health	Complications	BH	-0.86	26.49	-66.85	47.95
		SP	-35.07	21.14	-78.88	7.30
		SR	-30.43	11.92	-54.04	-6.63
Domain 2 Psychological	Complications	BH	-6.94	13.25	-35.08	20.25
		SP	-22.94	18.40	-62.95	14.00
		SR	-14.47	10.98	-36.59	2.65
Domain 3 Social relationships	Complications	BH	-4.53	19.66	-43.17	35.81
		SP	-11.12	32.28	-87.30	51.85
		SR	-39.78	9.17	-58.82	-21.03
Domain 4 Environment	Complications	BH	-12.13	13.32	-36.35	14.32
		SP	-18.28	14.85	-46.10	11.22
		SR	-16.70	7.03	-29.98	-2.63

Q: Question

important determinant to be factored into surgical decision making, besides the postoperative risk of complications and death [7].

QoL after HP has been compared to that of patients that had Primary Anastomosis (PA) in published series [7,11,12].

The present study set out to assess the QoL in the same patients that had emergency HP at different stages – before surgery, after surgery with colostomy in situ and after restoration of bowel continuity. To our knowledge this has not been assessed.

In this study all the HP were emergency procedures with complicated diverticular disease, the commonest indication which is consistent with published literature [1,3]. Our stoma reversal rate of 36.8% is less than the 57% to 61% reported in literature [3,5]. This difference may be due to our small sample size.

Several studies have tried to compare the QoL between non-homogenous groups of patients with a stoma and without a stoma, with some reporting a worse outcome in patients with a stoma while others did not [7,11,12].

Comparing BH and SP periods, general QoL, physical health, social relationships and the environment were not adversely affected by HP and creation of a stoma. This lack of negative change in QoL after HP and on siting the stoma could reflect patient's positive attitude after surviving a life-threatening condition, as stressful events tend to effect a change in life perspective and stimulate the pursuance of an acceptable QoL [13,14]. The presence of a stoma has also been shown to have minimal or no impact on ability to work or find work and to maintain good social relationships, particularly in the presence of strong family support and social networks [15,16]. With the environmental scores, the lack of variation could be because most patients' financial status and home environment did not change as most were retirees.

On the other hand, in our study, psychological health scores were lower when the stoma was in place. This may be related to the patient's new body image perception. The presence of a stoma has been shown to cause body image disruption, embarrassment and anxiety [15,17]. Support from postoperative counseling teams has been shown to lead to positive alterations in self- concept and esteem [18].

Among the patients who had their bowel continuity restored, scores in all domains were higher after stoma reversal than when the stoma was in place. Such a result could indicate an improved perception of body image and involvement in more engaging activities without the anxiety of possible stoma problems (i.e. bag leakage), thus resulting in less social isolation. Published literature report contradictory results on general QoL scores, whereas stoma reversal is associated with improved perceived physical and psychological health [7,14,19,20]. Interestingly, occurrence of altered bowel function after stoma reversal had been described as a possible cause of persisting lower psychological scores [18]; the authors cannot comment on that, since function after restoration of bowel continuity was not assessed in this study.

In our series, patients' demographics, comorbidities, post-Hartmann's complications, did not predict score outcomes in all the domains. Some authors have reported lower scores in female and young adults, due to body image issues [12,21]. However, among those who had their bowel continuity restored complications after stoma reversal surgery did seem to predict lower QoL scores. In the existing literature predictors of QoL had been evaluated in the context of different surgical procedures performed in the elective setting; young age, female gender, fear of surgery, prolonged operative time and postoperative pain were reported to have a negative impact on postoperative QoL [21-23].

Limitations

The study is limited by its retrospective nature, its small sample size and the possible presence of recall bias in patients. A large prospective study would help assess this better.

Conclusion

In conclusion, the present study shows that emergency HP is not associated with deterioration of general QoL, physical health, social function and environment, but has a negative impact on psychological health. Restoration of bowel continuity engenders positive changes in QoL perception, while morbidity after stoma reversal predicts poorer outcomes.

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