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Research Article

**REVERSAL OF HARTMAN'S PROCEDURE: TIMING AND  
TECHNIQUE**<sup>1</sup>Aleena Akbar Khan, <sup>2</sup>Mohammad Ijaz Ashraf, <sup>3</sup>Namra Urooj, <sup>4</sup>Irfan ul Islam Nasir, <sup>5</sup>Raza Husnain, <sup>6</sup>Shahik Khattak, <sup>7</sup>Aamir Ali Sayyed<sup>1</sup>Medical Officer, Shaukat Khanum Memorial Hospital and Research Centre, Lahore. Pakistan<sup>2</sup>Resident General Surgery, Shaukat Khanum Memorial Hospital and Research Centre, Lahore. Pakistan<sup>3</sup>Resident General Surgery, Shaukat Khanum Memorial Hospital and Research Centre, Lahore. Pakistan<sup>4</sup>Senior Instructor, Shaukat Khanum Memorial Hospital and Research Centre, Lahore, Pakistan<sup>5</sup>Consultant Surgical Oncology, Patel Hospital, Karachi, Pakistan<sup>6</sup>Consultant Surgical Oncology, Shaukat Khanum Memorial Hospital and Research Centre, Lahore. Pakistan<sup>7</sup>Consultant Surgical Oncology, Shaukat Khanum Memorial Hospital and Research Centre, Lahore. Pakistan**Abstract:**

**Introduction:** Hartmann's procedure is normally performed for left sided colonic pathologies in emergency situations. Restoration of intestinal continuity after Hartmann's procedure has traditionally been viewed to be technically demanding and associated with significant morbidity and mortality. This study has been done to show reversal rate after Hartmann's procedure in an Asian population.

**Methods:** Data collected from database showed that 100 patients had undergone Hartmann's procedure from Jan, 2006 to Dec, 2015 due to colorectal carcinoma. Patients who subsequently underwent Hartmann's reversal were identified and their records reviewed retrospectively.

**Results:** Hartmann's procedure was done under emergency situation in 74 patients either due obstruction (64%), perforation (9%) and anastomotic leak (1%). It is done electively in 26 patients mostly due to poor bowel preparation secondary to stenosing nature of tumor. Hartmann's reversal was done in 56 (56%) patients. The reversal was not offered in remaining patients either due to disease recurrence (34.7%), metastasis (30.4%), lost of follow up (21.7%) or others (10.8%). The median interval between resection and reversal was 32 weeks.

**Conclusion:** In our population, Hartmann's procedure is more commonly performed for colorectal cancer under emergency situations. Reversal rate is 56% and the most common reasons for not reversing the disease are either locoregional recurrence or distant metastasis.

**Key Words:** Hartman's Procedure, Colorectal cancer, Hartman's Reversal, Metastasis

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**INTRODUCTION:**

Hartman's procedure (HP) is the resection of the primary rectal or sigmoid cancer with formation of an end colostomy [1,2]. It has been used to treat conditions like volvulus of the sigmoid colon, diverticular disease, traumatic colonic perforation and radiation injury. It is also used in colorectal cancers in emergency situation like obstruction or perforation and in those who are believed to be at high risk for anastomotic leak [1,2].

The colostomy affects the quality of life as compared no stoma. So reversal is important for improving the psychological and social life of the patient. It has been observed that reversal of Hartman's procedure improves the quality of life when compared with patients with primary anastomosis [11]

Re-anastomosis after Hartmann's procedure is technically demanding and associated with significant morbidity up to 25%<sup>3</sup> and mortality up to 14%<sup>4</sup>. This is why almost half the patients undergoing Hartman's procedure will not have their stoma's reversed<sup>5-7</sup>. The factors that hinder reversal are advanced age, ASA score, high-risk status, patient refusal, and a fear of postoperative complications [7-10].

In our population the most common reason of Hartman's procedure is colorectal carcinoma followed by sigmoid volvulus as compared to western world where diverticular disease is most common cause<sup>12</sup>. No evidence exists from our part of the world regarding the outcomes of the patients undergoing Hartman's procedure. We did a

retrospective analysis of our patients undergoing Hartman's procedure to see the indications, rate of reversal and the technique used to reverse the colostomy.

**METHODS:**

The medical records of all patients who underwent Hartmann's procedure between Jan 2006 to Dec 2015 were identified. Information retrieved included age of patient, indications for Hartman's procedure, stage of disease, interval between creation and reversal of Hartmann's procedure, technique used and factors which hinder the reversal. All the parameters were analyzed using the SPSS.

**RESULTS:**

A total of 100 patients underwent Hartman's procedure from Jan 2006 to Dec, 2015. The median age was 49.5 years. There were 67 males and 33 females. All procedures were done on patients with colorectal cancer. Procedure was done under emergency situation in 74 patients either due to obstruction (86.4%), perforation (12.1%) and anastomotic leak (1.3%). It is done electively in 26 patients mostly due to poor bowel preparation secondary to stenosing nature of tumor (92.3%) and extensive local disease (7.6%).

Hartmann's reversal was done in 56(56%) patients. The reversal was not offered in remaining patients (44%) in whom the most common cause was disease recurrence found in 34.7% followed by metastasis (30.4%). The median interval between resection and reversal was 36 weeks.

**Table 1: Indications, techniques and reason for failure of Hartman procedure**

Variables		N=100	%
<b>Diagnosis</b>	Colorectal Cancer	100	100
<b>Gender</b>	Male	67	67
	Female	33	33
<b>Setting</b>	Emergency	74	74.0
	Elective	26	26.0
<b>Indication</b>	Obstruction	64	64.0
	Poor Bowel Prep	24	24.0
	Perforation	9	9.0
	Advanced Disease	2	2.0
	Anastomotic Leak	1	1.0
<b>Site of Tumor</b>	Sigmoid	49	49.0
	Rectosigmoid	23	23.0
	Descending	16	16.0
	Transverse colon	5	5.0
	Splenic flexure	7	7.0
<b>Stage of Disease</b>	Dukes B	38	38.0
	Dukes C	62	62.0

<b>Reversal Done</b>	Yes	56	56.0
	No	44	44.0
<b>Reason for failure of reversal</b>	Metastatic Disease	14	30.4
	Lost of follow up	10	21.7
	Death of patient	2	4.3
	Recurrence	16	34.7
	Fibrosed stump	3	6.5
	Advanced age	1	2.1
<b>Technique of reversal</b>	Open	44	78.5
	Laparoscopic	9	16.7
	Lap to open	3	5.3

### DISCUSSION:

For left sided colonic cancer, primary resection and anastomosis is an ideal option except in case of complications like perforation or obstruction where Hartman's procedure is preferable option. In these conditions survival of patient is more important than restoring bowel continuity. In our Hartmann's procedure was done in 100 patients with colon cancer. 74 patients underwent it in emergency due obstruction (65.1%), perforation (9.4%) and anastomotic leak (1.9%). It is done electively in 26 patients mostly due to poor bowel preparation secondary to stenosing nature of tumor. Because ours is a cancer hospital so we didn't see any other causes for Hartman procedure.

Reversal was done in 56% of our patients. Procedure was done either open or laparoscopically. 56% reversal rate is much higher as compared to other studies. Rate of reversal depends on multiple options like disease status, age of patient, expected length of survival, patient's general condition and also on patient choice. So reversal of Hartman's procedure is difficult procedure with reversal rate of 4-85%. It is higher for diverticular disease as compared to colonic cancers. (31-85% vs 4-53%)<sup>13-16</sup>. This is why almost half the patients undergoing Hartman's procedure will not have their stoma's reversed<sup>5-7</sup>. The factors that hinder reversal are advanced age, ASA score, high-risk status, patient refusal, and a fear of postoperative complications<sup>5-7</sup>. In our study the reason for failure of stoma reversal were disease recurrence (34.7%), metastasis (30.4%), lost of follow up (21.7 %). The benign causes for failure were fibrosed distal stump secondary to radiation (6.5%) and advanced age (2.1%).

The average time to reversal was 36 weeks. Delayed reversal is advocated in several studies because less dense adhesions, lower risk of bowel injury and more time to optimize patient nutritional and clinical status making them more suitable candidate for reversal [18-

20]. While some studies favor early reversal within one month due to lower complication rate [21]. Most common reason for delay in our patients was adjuvant therapy administered after operation and pathological staging of disease.

Reversal was done laparoscopically only in 9 patients. In remaining patients it was done directly open or laparoscopic trial and then converted to open secondary to dense adhesion. The conversion rate for this procedure in literature is 15 to 23.5 % [22-24]. In our study 83.9 % patients underwent open surgery due to adhesions and short distal stump. As 74 % patients underwent Hartman's procedure under emergency situation either due to perforation or obstruction so these dense adhesions were mainly from inflammatory sequelae from initial procedures.

### CONCLUSION:

Our Asian population has a high incidence of colorectal cancer, and hence, Hartmann's procedures are more commonly performed for colorectal cancer rather than for diverticular disease. Although the reversal is more challenging due to short rectal stump, emergency nature of disease and post adjuvant therapy effects but still reversal is done in almost all the patients who have non recurrent and non metastatic disease.

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