Hartmann Procedure for Carcinoma of the Sigmoid and Rectum

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REMOVAL OF THE SIGMOID COLON with intraperitoneal closure of the bowel below the tumor combined with an end sigmoid colostomy was first described by Henri Hartmann in 1921.[4] In 1927, his student, Soupault, reported on 31 cases with two operative deaths.[11] Hartmann reviewed his group of 34 cases in 1934.[5] In his series, there were four postoperative deaths resulting in an operative mortality of 8%.

The scope of Hartmann's operation was extended by Gabriel,[1] Rankin,[9] and Muir.[8] These surgeons used the operation for carcinomas at or below the peritoneal reflection, and left the closed rectal stump in an extraperitoneal position. Both Gabriel and Muir emphasized pelvic abscess as an important complication of the extended procedure. Golliger differentiated Hartmann's operation from "the Extended Hartmann Procedure."[3] Most surgeons, he believed, used the intraperitoneal operation. The major disadvantage cited by Golliger with the extended procedure was difficulty in establishing adequate drainage of the pelvic cavity when the rectal stump is closed in the extraperitoneal position.

This report represents a review of 100 consecutive Hartmann resections done at the Columbia-Presbyterian Medical Center and Francis Delafield Hospital from 1929–1969.

Clinical Study

Review of 100 consecutive Hartmann resections from 1929 through 1969 revealed that 61 were done after 1950. There were 56 men and 44 women in the series. The average age of the patients was 60.5 years (range 19 to 91 years).

Hartmann resection was employed as a palliative procedure in 65% of cases. Pathologic classification of tumors revealed 2% Duke's A, 26% Duke's B, 29% Duke's C, and 41 Duke's D (total 98%). Two procedures were done for gynecologic cancers. Extension of the carcinoma beyond the bowel wall was present in 43% and liver metastases were present in 27% of cases.

Hartmann's operation with intraperitoneal closure of the rectal stump was done in 43 instances. Extended Hartmann's procedure was done in 57 instances.

The indications for performing a Hartmann procedure are listed in Table 1. The procedure was chosen when anterior resection with anastomosis could not be safely accomplished and when the extended dissection of abdominoperineal resection was considered too hazardous. Often, when faced with sudden deterioration in the patient's condition during a planned anterior or abdominoperineal resection, the surgeon resorted to closure of the rectal stump and an end sigmoid colostomy to rapidly terminate the procedure. The presence of a perforated carcinoma with a pelvic abscess or locally extensive carcinoma suggesting inevitable local recurrence were also frequent indications.

Morbidity and Mortality

There were 18 hospital deaths resulting in a mortality rate of 18%. Thirteen of the patients died within 30 days of this operation. Pelvic abscess was the principal cause of death in 11 of the 18 hospital deaths. Three additional patients died of sepsis without pelvic abscess, one died of bronchopneumonia, one of pelvic hemorrhage, one of a thrombosed aorta and one of carcinomatosis. The breakdown of mortality according to type of procedure is noted in Table 2.

Postoperative pelvic infection was noted in 30% of cases with intraperitoneal closure of the rectal stump

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but was present in 75% of extended Hartmann procedures.

The average period of postoperative hospitalization for patients with intraperitoneal closure of the rectal stump was 25 days. Forty-two days were required for the extended Hartmann procedure. This longer period of hospitalization was directly related to the treatment of pelvic infection.

Long-term Follow-up

Of the 32 curative resections 10 patients, or 30% were free of tumor at 5 years. three patients had been lost to follow-up, and there were five operative deaths. The patients died of the disease an average of 31 months postoperatively.

Of the 69 palliative resections performed average survival was 11 months. Five patients in this group were lost to follow-up and one was alive at 42 months free of disease and one was alive at 31 months with recurrent disease.

Local recurrence rate for Duke's B tumors was 35% and was 48% for Duke's C tumors. This compares to a local recurrence rate of 25% for Duke's B and 38% for Duke's C following abdomino-perineal resection in cases reviewed at our institution from 1944 to 1963. During the same period, local recurrence following anterior resection was 23% for Duke's B and 33% for Duke's C cancers.[10]

Discussion

It is clear from our review that Hartmann procedures have been done at our institution primarily in the poor risk patient with advanced cancer in the hope of achieving an increased degree of palliation, in terms of longevity and comfort, over that available from colostomy alone.

The extended Hartmann procedure has been used frequently in poor risk cases where a low anastomosis was difficult and the prospect of local recurrence was high. In the recent 20-year period, 60 per cent of Hartmann resections involved extraperitoneal closure of the rectal stump whereas prior to 1950 less than half the cases were of the extended type.

Although mortality for the original type of Hartmann resection with intraperitoneal closure has declined from 30% to 9% as a result of improved preoperative preparation and postoperative management,[6] the extended Hartmann procedure still carries a 16% mortality. Despite antibiotic therapy, the extended Hartmann resection with its extraperitoneal closure of the rectal stump incurs a 75% incidence of pelvic septic complications and an average hospital stay of 42 days. Consider carefully this rate of morbidity in light of anticipated survival following palliative resection of cancer in the rectum or rectosigmoid. The average survival of less than 12 months in our series of extended Hartmann resections for incurable malignancy represents little significant palliation over simple diverting colostomy.[2]

TABLE 1. *Indications*

1.	Widespread metastases	18
2.	Locally extensive carcinoma	24
3.	Perforation with fecal spillage during surgery	9
4.	Preoperative perforation or abscess	9
5.	Technical difficulty with anastomosis	9
6.	Advanced age or "poor risk patient"	9
7.	Intraoperative physiologic emergency	6
8.	Indication not stated	16
	Total	100

If the extended Hartmann resection is to be used as an effective alternative to abdomino-perineal resection in poor risk patients, it is imperative that we reduce the risk of pelvic sepsis and mortality to more reasonable levels. Antibiotic preparation of the bowel and aseptic technic alone are not sufficient in the face of a contaminated retroperitoneal space between rectal stump and peritoneal closure. Adequate drainage of this space can best be accomplished by not closing the peritoneum at all, and by draining the pelvis with sump suction catheters either abdominally through a lower abdominal stab wound or behind the rectal stump in the presacral plane. Drainage through the rectal stump has proved unsatisfactory.

Although anterior resection, even with antibiotic preparation, carries a 12% risk of anastomotic or intrapelvic infections it is preferred to Hartmann resection if technically feasible.[10] When the patient is such a poor risk that abdomino-perineal resection is considered too hazardous, we might choose to perform a diverting colostomy and control the tumor by fulguration.[7,12] In cancer of the distal sigmoid where anastomosis is dangerous because of pelvic infection secondary to perforation of the tumor, unresectable spread within the pelvis, or intra-operative deterioration of the patient's condition we shall not hesitate to proceed expeditiously to a Hartmann type resection particularly where intraperitoneal closure with an adequate margin of resection is possible.

Summary

Hartmann's procedure for carcinoma of the pelvic colon is described and differentiated from extended

TABLE 2. *Mortality*

	1929–1950	1951–1969
Original Hartmann	7/20 = 35%	2/23 = 9%
Extended Hartmann	3/19 = 16%	6/38 = 16%

Hartmann's procedure where the distal line of resection is extraperitoneal.

The original procedure has a definite but limited place in the surgeon's repertoire when dealing with a poor risk patient with carcinoma of the distal sigmoid. Extended Hartmann's procedure should be used only rarely and with caution. Methods of decreasing the mortality and morbidity of extended Hartmann's procedure are discussed.

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