

Synchronous abdominoperineal resection without transfusion

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Blood loss and hypovolaemic shock affect the immune system significantly, and perioperative blood transfusion has been shown to be associated with a higher rate of tumour recurrence in patients with cancer and increased susceptibility to infectious complications. Data obtained from patients undergoing synchronous abdominoperineal excision of the rectum were analysed to assess whether such surgery is feasible without transfusion. Twenty-two consecutive unselected patients were studied. There were 16 men and six women of median age 66 (range 48-80) years. The tumour stage was Dukes' B in 11 patients and Dukes' C in 11. Six patients were severely obese according to body mass index. Four patients required blood transfusion (1, 1, 2 and 2 units). There was no hospital mortality and all perineal wounds healed primarily with no wound infection. Fifteen patients received radiation therapy 6 weeks after surgery. Abdominoperineal resection with minimal blood transfusion is feasible in unselected patients.

Blood transfusion may be a significant factor affecting the function of the immune system after operation and leading to an increased susceptibility to infection^{1,2} and multiple organ failure. In patients with cancer the immunosuppressive action of transfusion may be deleterious. Some have reported increased recurrence and decreased survival rates in patients with colorectal³ and breast⁴ cancer. Blood loss and hypovolaemic shock affect the immune system⁵, and hypovolaemic events significantly enhance tumour growth, independent of blood transfusion⁶.

Other deleterious effects of transfusion during surgery are related to the potential risk of transmission of human immunodeficiency virus (HIV) 1 or hepatitis B and C viruses.

From 1983 to 1991 a prospective study was carried out to examine the feasibility of performing synchronous combined abdominoperineal excision of the rectum without blood transfusion.

Patients and methods

Between September 1983 and October 1991, 22 consecutive unselected patients (16 men, six women) underwent synchronous combined abdominoperineal excision of the rectum. All patients had rectal cancer located 0-7 cm from the anal verge. The mean age was 65 (median 66; range 48-80) years. The preoperative condition of each patient was assessed using the American Society of Anesthesiologists (ASA) classification⁷.

A final decision to perform abdominoperineal resection was made at surgery when low anterior resection could not be performed safely or because of bulky local extension of the tumour. The 22 patients represented 16 per cent of a total of 139 with rectal cancer operated on during the study period. The remaining 117 patients underwent anterior resection of the rectum.

The body mass index (BMI; weight (kg)/height² (m²)) was calculated⁸ for each patient.

Complete closure of the pelvic peritoneum was performed by the abdominal operator after careful inspection of the sacral concavity for all remaining bleeding points. The perineal operator sutured the levator ani muscles in the midline, as well as fat and skin. The sacral concavity below the pelvic peritoneum was drained by two 19-Fr suction drains through separate stab wounds. All patients received broad-spectrum antibiotic therapy from the day of surgery, ending on day 4 after operation.

Results

Physical status and pathological staging

Sixteen patients were classified as ASA grade II, four as ASA III and two as ASA IV. Fourteen patients (Table 1) were considered to be moderately to severely obese at the time of surgery. Eleven patients had Dukes' B tumours and 11 Dukes' C (C₁ in ten, C₂ in one).

Postoperative complications and mortality

Morbidity was related mainly to intermittent urinary problems in elderly men with prostatic hypertrophy (urinary tract infection, one; retention, six). Primary healing of the perineal wound was obtained in all patients. The mean duration of hospital stay was 19 (median 20; range 10-37) days. One patient had a pulmonary embolus, but there were no other complications and no deaths. At 6 weeks after surgery, 15 patients received pelvic external-beam radiation therapy because of extensive rectal tumour invasion of the anal sphincters. A total dose of 45-50 Gy was administered at a rate of 9-10 Gy per week.

Blood transfusion, hypotensive episodes and drainage volumes

No patient developed intraoperative hypotension and only four received perioperative transfusion. Anaemia, related to the cancer, was the reason for preoperative transfusion in two patients (with haemoglobin levels of 4.8 and 5.0 mmol/l), who both received 2 units packed red cells. The two other patients who underwent transfusion had preoperative haemoglobin levels of 6.2 and 6.0 mmol/l, and a level of 5.5 mmol/l on day 1 after operation. They were admitted to the intensive care unit because they were ASA grade III and had ischaemic heart disease. Both received 1 unit packed red cells as a routine order

Table 1 Body mass index before operation in 22 patients

Grade	Body mass index (kg/m ²)	No. of patients
0 (normal)	20.0-24.9	8
I (moderately obese)	25.0-29.9	8
II (severely obese)	30.0-40.0	6

from the coronary intensive care unit team. The remaining 18 patients, who did not undergo transfusion, had a mean preoperative haemoglobin level of 7.8 (median 8.0; range 6.4–9.0) mmol/l. At discharge the mean level was 7.2 (median 7.4; range 6.2–8.0) mmol/l. Meticulous control of all bleeding points and careful surgical dissection enabled blood loss to be kept to a minimum without increasing the length of surgery. The mean duration of surgery was 270 (median 240; range 200–420) min. The total volume of drainage fluid was recorded for each patient (mean 220 (median 320; range 125–400) ml). The mean duration of perineal drainage was 4 (range 3–5) days. The volume of drainage fluid for the four patients who underwent transfusion was 130, 150, 200 and 260 ml.

Discussion

Synchronous combined abdominoperineal excision of the rectum for tumours located 0–7 cm from the anal verge was the standard operation for most surgeons⁹. Despite current use of sphincter-saving operations, combined excision of the rectum is an important operative treatment for very low tumours⁹. This type of resection leaves a large perineal wound that can be slow to heal if primary closure has been impossible or considered unsafe. The synchronous approach may be more traumatic than other types of rectal excision, because the total surgical trauma is inflicted in a shorter length of time in two surgical areas. Provided the synchronous method is practised under good conditions by fully trained surgeons it is possible to obtain primary healing of the perineal wound. It is also possible to perform an almost bloodless operation and to avoid blood transfusion. Positioning of the patient in the lithotomy–Trendelenburg position with Lloyd-Davies' leg rests offers a satisfactory approach for the abdominal and perineal dissections, even in overweight patients. None of the six severely obese patients (BMI \geq 30 kg/m²) in this series required transfusion.

Blood transfusion during and after surgery in patients undergoing elective colorectal procedures is followed by infection in 23 per cent of cases². Others have shown that, in patients with various malignancies^{3,4}, there is a higher rate of tumour recurrence in those who received blood transfusion. These findings are not uniformly observed¹⁰, and a more recent study⁵ has shown that the most significant single factor affecting recurrence rate is the number of hypotensive episodes during

the operative procedure. Whichever is the most detrimental variable (blood loss, blood transfusion, hypotensive episodes, or all three), the surgeon must try to avoid all of them.

There are theoretical potential risks of infecting the patient with HIV-1 or hepatitis B and C viruses transmitted by blood transfusion. Such a risk should be sufficient to stimulate surgeons to perform bloodless operations.

These results demonstrate that extensive abdominoperineal resection with minimal transfusion can be performed in unselected patients with low rectal tumours.

References

1. George CD, Morello PJ. Immunological effects of blood transfusion upon renal transplantation, tumor operation and bacterial infections. *Am J Surg* 1986; **152**: 329–37.
2. Jensen LS, Andersen AJ, Christiansen PM *et al.* Postoperative infection and natural killer cell function following blood transfusion in patients undergoing elective colorectal surgery. *Br J Surg* 1992; **79**: 513–16.
3. Foster RS, Costanza MC, Foster JC *et al.* Adverse relationship between blood transfusions and survival after colectomy for colon cancer. *Cancer* 1985; **55**: 1195–201.
4. Tartter PI, Burrows L, Papatestas AE, Lesnick G, Aufses AH. Perioperative blood transfusion has prognostic significance for breast cancer. *Surgery* 1985; **97**: 225–9.
5. Younes RN, Rogatko A, Brennan MF. The influence of intraoperative hypotension and perioperative blood transfusion on disease-free survival in patients with complete resection of colorectal liver metastases. *Ann Surg* 1991; **214**: 107–13.
6. Younes RN, Rogatko A, Vydelingum NA, Brennan MF. Effects of hypovolemia and transfusion on tumor growth in MCA-tumor bearing rats. *Surgery* 1991; **109**: 307–12.
7. Lewin I, Lerner AG, Green SH, Del Guercio LRM, Siegel JH. Physical class and physiologic status in the prediction of operative mortality in the aged sick. *Ann Surg* 1971; **174**: 217–31.
8. Hautvast FG, Deurenberg P. The risks associated with obesity: epidemiological studies. In: Bender AE, Brookes LJ, eds. *Bodyweight Control*. Edinburgh: Churchill Livingstone, 1987: 65–71.
9. Goligher J. *Surgery of the Anus, Rectum and Colon*. 5th ed. London: Baillière Tindall, 1984: 590–779.
10. Francis DMA, Judson RT. Blood transfusion and recurrence of cancer of the colon and rectum. *Br J Surg* 1979; **74**: 26–30.

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