ORIGINAL ARTICLE

OUTCOME OF EMERGENCY COLORECTAL CANCER ADMISSIONS IS DETERMINED PRIMARILY BY PHYSICAL STATUS

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ABSTRACT: **A retrospective cohort study of 206 consecutive patients with colorectal cancer presenting to three general surgeons in the University Hospital, Kuala Lumpur over a 3-year period is reported. In all, 184 patients had an operation and are grouped according to whether their operation was within 24 hours of admission (n=16), more than 24 hours after admission (n=38), or elective (n=130). Operative mortalities for these groups were 15.9%, 15.2% and 6.5%, respectively, significantly higher in both the emergency groups. Delayed surgery to allow complete resuscitation did not improve the operative mortality when compared with those patients having urgent surgery. Both groups of emergency patients, delayed (27%) and urgent (19%), showed poorer 5-year survival than the electively treated patients (36%), many dying of non-cancer causes.**

Patients who undergo emergency surgery for colorectal carcinoma are more likely to be in poorer physical condition than the patients undergoing elective surgery for the same condition. It appears that the physical status is the principal determinant of outcome after emergency colorectal surgery rather than any other factor. *(JUMMEC 1996 1(1):29-32)*

KEYWORDS: **colorectal cancer, emergency, outcome**

Introduction

The three principal reasons why patients with large bowel cancer undergo emergency operation are obstruction, perforation and, much less commonly, bleeding. Most authors report an increase in operative mortality, a lower rate of curative resection and worse 5-year survival in such patients (1,2,3).

Emergency surgery for colorectal cancer differs from elective surgery in that:

There is little opportunity to assess and improve the patient's physical status.

1. The surgeon is more likely to be a trainee.
2. The tumour is less likely to be resectable.
3. The tumour is more likely to be at a more advanced stage.

It is not clear from the literature which, if any, of these factors are responsible for the poor outcome in patients undergoing emergency operations. Precise definition of the factors which increase operative mortality may allow patients with greater risk to be identified and thus their care optimised.

In an attempt to define an easily identifiable subgroup of patients, we have analysed the outcome of treating two groups of emergency patients, those operated upon within 24 hours (urgent) and those whose operation was delayed for more than 24 hours after admission (delayed).

Materials and Method

All patients presenting with colorectal cancer to three general surgeons at the University Hospital, Kuala Lumpur, and who had operations over a 3-year period (1990-1992), were analysed and the information stored on a database. We obtained a detailed history and recorded investigations, operative findings and pathology in all cases. The patients were followed up (2 years) to obtain evidence about recurrence, and where death had occurred, the cause was established either from a clinician or a pathologist.

On entry into the study it was recorded whether the patient was admitted as an emergency or electively. Within the emergency group a subset of patients who were operated on within 24 hours of admission was identified.

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The performance status of each patient was noted according to the Eastern Co-operative Oncology Group (USA) (4) criteria:

Stage 0 - Fully active, pre-disease status.

Stage 1 - Ambulatory, capable of light work.

Stage 2 - Capable of self-care, not able to work.

Stage 3 - In bed 50% of time, limited self-care.

Stage 4 - Completely bed-ridden, incapable of self-care.

Other data recorded were the type of operation, the grade of surgeon, and whether the operation, in the opinion of the surgeon, was curative.

Based on the depth of penetration and local spread, tumours were given a *Dukes' staging*. All histology reports were reviewed and graded by one clinician.

The number of post-operative days spent in hospital before discharge was recorded. Details of wound infection, chest, urinary and abdominal sepsis (including faecal fistulas) were recorded. A *minor* wound infection was defined as a purulent wound discharge with positive bacteriology. A *major* wound infection was defined as being present when there was also pain, pyrexia and, if taken, a positive blood culture. Non-septic complications were also recorded.

All patients have been followed up (5 years) to determine whether they are alive and well, alive with recurrent disease, or dead. In all cases of death it was determined whether death was due to large bowel cancer or other cause. Survival analyses were performed, first using uncensored data, i.e. end-point defined as death due to any cause and, secondly, with data censored according to whether death was due to colorectal cancer. The 5-year survival statistics are shown for both methods of analysis.

Table 1: ***Demography of Colorectal Cancer Patients Admitted to the University Hospital Kuala Lumpur 1990 -1992***

	Urgent	Delayed	Elective
Patients operated	16(8.7%)	38(20.6%)	130 (70.7%)
Sex:			
Male	9	18	68
Female	7	20	62
Age:			
Median	73.6	73.5	70.8
Range	37-93	37-101	32-101
Performance status*:			
0	2	8	49
1	6	10	49
2, 3 or 4	8	20	32

Performance status X^2 = 14.4; df = 4; p=0.0061

Data analysis was conducted by using the statistical package SPSS-X. The significance of difference between the groups has been assessed by Mann-Whitney *"U"* test, the *Chi-square* test & *Fischer's* exact test, as appropriate, a

p value of less than 0.05 was accepted as significant.

Results

Demography

A total of 206 consecutive patients with colorectal cancer presented to three general surgeons in the University Hospital over a period of 3 years (1990-1992). Of these, 145 patients (70%) were admitted electively and 61 patients (30%) as emergencies. In all, 14 elective patients and 8 emergency patients had advanced disease and were unfit for surgery. The 184 patients who were offered surgical treatment were analysed.

Three main groups were identified:

Table 2: ***Presenting Symptoms***

	Urgent	Delayed	Elective
Altered bowel habits:			
Decrease	10/16(62%)	16/38(43%)	29/130(23%)
Increase	3/16(21%)	9/38 (24%)	53/130(41%)
Tenesmus	1/16	4/38	29/130
Rectal bleeding	3/16	10/38	66/130
Vomiting	10/16	14/38	13/130
Abdominal pain:			
Colic	6/16(38%)	17/38(44%)	45/130(35%)
Constant	6/16(38%)	10/38(27%)	20/130(16%)

"urgent" group, i.e. surgery within 24 hours of admission, 16 patients.

"delayed" group, i.e. surgery more than 24 hours after admission, 38 patients.

"elective" group, 130 patients.

Demographic details are shown in Table 1. The age and sex distributions for all groups were very similar. Patients in both emergency groups are of a poorer performance status when admitted compared with the elective group ($p=0.0061$).

Presenting symptoms

In the "urgent" group, 10 patients (62%) had a decrease in bowel habit, and in the "delayed" group 16 patients (43%). This was less common in the "elective" group ($X^2=58.8, df=6, p<0.0001$). However, the elective patients

were more likely to report tenesmus and rectal bleeding than were those in the emergency groups (Table 2).

10 patients (62%) in the "urgent" group and 14 patients (37%) in the "delayed" group presented with vomiting. This difference was significant (X^2=11.9, df=1, p=0.0009).

More than 35% of all groups had experienced some colicky pain; however, patients in the "urgent" group were much more likely to have constant pain (38%) compared with the "elective" group (16%). Constant pain was also experienced in 10 (27%) of the "delayed" group.

Operative details

The "urgent" group cases were less likely to have been operated on by the general surgeon, whereas 77% of all operations in the "elective" group were performed by the surgeon (X^2=19.6, df=2, p<0.0001).

Table 3: ***Operative Details***

	Urgent	Delayed	Elective
Grade of Surgeon*:			
Lecturer (Surgeon)	4	25	101
Medical Officer	12	13	29
Not operated	2	3	5
Resection*:			
None performed	4	4	7
Resections performed	10	31	120
(curative resections)	8/10 (80%)	24/31 (77%)	84/120 (70%)
Wound infections:			
None	10	28	94
Minor type	4	8	26
Major type	2 (12%)	2 (5%)	10 (8%)
Dukes' classification#:			
A	1	2	15
B	8	21	69
C	5	13	42
Undefined	2	2	4
Operative mortality rate:	3/16 (18%)	6/38 (16%)	9/130 (7%)

*grade of surgeon (X^2=19.6, df=2, p<0.0001)
#A vrs B vrs C (X^2=1.39, df=4, p=0.8459)

Of the elective patients, 120 (92%) had a resection performed at first operation compared with 10 (62%) and 31 (82%) in the "urgent" and "delayed" groups, respectively. A high number of patients in the "urgent" group were not able to have a resection at the time of admission due to severely obstructed bowel. If a resection was performed at operation, there were no significant differences between the three groups in the resulting number classed as "curative" (X^2=1.36, df=2, p=0.51) (Table 3).

The incidence of minor wound infections was similar, and although the rate for major infections in the "urgent" group was slightly higher (12%), it was not statistically significant compared with the "delayed" (5%) or "elective" (8%) groups.

The operative mortality rate for both the "emergency" groups was significantly higher (15%) than for the "elective" group (7%) (Table 3) (X^2=14.4, df=2, p=0.001).

Survival

Using uncensored data, 5-year survival rates for elective patients was significantly better than for patients in both emergency groups (X^2=15.5, df=2, p=0.0004) (Figure 1). There was an apparent difference in survival between the "urgent" and "delayed" groups; the "urgent" group fairing worse at 5 years, although this difference was not statistically significant (Table 4).

Using censored data, there remained a highly significant difference in survival between the three groups (X^2=10.3, df=2, p=0.006) (Figure 2), although this was largely due to the low survival rate in the "urgent" group. The "delayed" group (40% survival) and the "elective" group (44% survival) were much more comparable after censoring for deaths arising due to other medical causes.

Table 4: ***5-Year Survival Rate***

	Urgent	Delayed	Elective
Uncensored			
any cause of death	19%	27%	36%
Censored			
cancer-associated death	26%	40%	44%

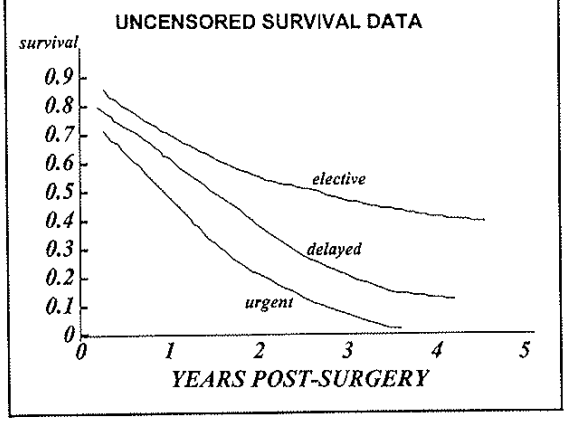
Discussion

The purpose of this study was to compare three well-defined sub-groups of patients treated electively or as emergencies, looking at their demography, symptoms and outcome.

Patients admitted as emergencies were of a significantly worse performance status than patients admitted electively. Similarly, there were significantly more early stage cancers in the "elective" group and less Dukes' C patients. Performance status and Dukes' staging are both closely associated with survival outcome, which in this study was significantly better for patients in the "elective" group. Many of the patients die of medical conditions and not cancer, reflecting the influence of non-cancer factor on the outcome of surgery and is particularly prominent in the "delayed" patient group.

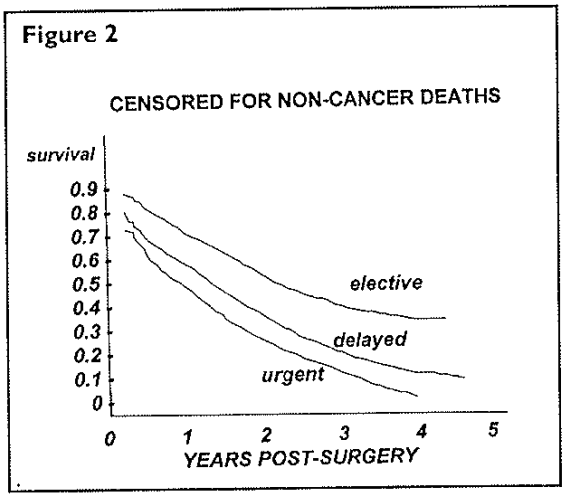
Operative mortality was significantly higher in the "emergency" groups when compared with the "elective" group, but similar to the rate reported in other series (5,6).

Figure 1



The operative mortality rate for the "urgent" operations was not higher than that reported for the "delayed" group, despite a greater proportion being operated on by junior staff. This finding is not in agreement with Chester and Britton (1) or Fielding et. al. (7), who noted an increase in post-operative deaths in patients undergoing emergency operation or operation for obstruction when operated by junior staff. In neither of these studies did the authors study emergency patients as we have done by looking at the outcome of immediate and delayed operation for these patients. It is our practice to put the delayed emergency patients onto the next elective list when the majority would have an operation performed by the surgeon.

Figure 2



To delay cases until resuscitation is complete is advised by Darby et. al. (5) as being beneficial, reducing the number of unprepared patients being opearted on during the night by junior staff. However, we found no difference in operative mortality between delayed and urgent cases. Chester and Britton (1) found no difference in the outcome of elective surgery whether undertaken by a surgeon or junior, but they indicated that the especially frail and ill patients presenting for elective surgery may have been dealt with by surgeons. In our practice it is likely that those emergency patients requiring operation within 24 hours are chosen not only on the basis of signs of obstruction or perforation, but on their physical status, is the more ill and frail being delayed. The majority of patients dying in the post-operative period were operated on by surgeons, as also noted by Darby et. al. (5). Poor physical status patients are frequently discussed in "Audit" meetings when the surgeon finds it difficult to know how to avoid death in patients with poor physical status. The confidential enquiry into peri-operative deaths ny Buck et. al. (8) recommended that the elderly and frail should be more critically examined as their fitness for operation. In other study by Kingston et. al. (9), of patients undergoing elective colonic surgery, multivariate analysis was used to conclude that age, performance status and operative faecal contamination were statistically significant factors influencing post-operative death.

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