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## Emergency surgery for recurrent intraabdominal cancer

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### Abstract

**Background:** Recurrent abdominal cancer can manifest in many ways but there are certain situations that are a great challenge to clinicians. Emergency presentation is one such situation. Surgeons are faced with a therapeutic dilemma that on the one hand most of these patients have a limited life expectancy, and on the other surgical procedures are unavoidable. We reviewed our experience of recurrent abdominal cancers presenting with acute abdominal symptoms requiring emergency.

**Patients and methods:** Over the last 10 years, 81 patients with recurrent abdominal cancer presented with an abdominal emergency. Case records, operative notes and histology were reviewed. Frequency distributions were prepared for clinical, hematological, biochemical parameters, treatment and complications. Surgical analysis was carried out by the Kaplan Meier method and groups were compared using a log-rank test.

**Results:** The mean age of the patients was 70.1 years with a female to male ratio of 1.25. An overall postoperative mortality of 11.1% and morbidity of 27.1% was observed. Postoperative infections and respiratory complications were the most common causes of morbidity and mortality. Emergency resections carried the same risk of mortality and morbidity as the other surgical procedures ( $p > 0.05$ ). Patients who underwent radical or palliative resections had a better survival than patients undergoing other procedures ( $p < 0.05$ ). Preoperative Apache II score was found to be single most important predictor of postoperative mortality and morbidity.

**Conclusions:** We conclude that surgical resection offers the best chance for improvement in survival after emergency surgery for recurrent abdominal cancer. If resection is not feasible, the possibility of creating a bypass or enterostomies should be considered to improve the patients' quality of life.

### Background

Recurrence in abdominal cancer can manifest in number of ways, however, there are certain groups of patients that present clinicians with a diagnostic and therapeutic chal-

lenge. Emergency surgical presentation is one such situation where the surgeon is faced with a therapeutic dilemma. On the one hand, it is clear that most of these patients may have a limited life expectancy, while, on the

other, surgical intervention appears to be unavoidable in these circumstances. The most common emergency surgical presentation is a bowel obstruction [1]. Other common presentations are perforations and bleeding.

These emergencies can be caused by a number of different malignant neoplasms like gynecological cancers, colorectal cancer, and stomach cancer etc. Malignant bowel obstruction is a well-recognized complication in advanced gynecological cancer but the most common cause of intestinal obstruction is colorectal cancer [2].

Before the patient is taken up for surgery a preoperative work-up for accurate staging and optimization for hematological and biochemical derangements is essential. An aggressive attitude leads to an increased resectability rates, however a significant number of patients develop postoperative complications and thus results in significantly increased morbidity and mortality [3].

Oncological operations as such carry a higher mortality and morbidity than other standard abdominal procedures. This risk is further increased in recurrent disease and in emergency situations. Hence, to obtain the best possible survival results the risk factors must be weighed against possible benefits before deciding to operate on a patient with emergency complication of abdominal cancer recurrence. Literature is abound with surgical resection of recurrent abdominal cancers [4] however, the literature on emergency presentation of recurrence is scarce. A recent multidisciplinary working group of the European Association of Palliative Care reviewed issues regarding bowel obstruction and has published clinical practice recommendations for the management of bowel obstruction in patients with terminal stage cancer [5].

The aim of the present study was to evaluate the mortality and morbidity of emergency surgery in recurrent abdominal cancers and to identify the factors predicting the mortality and morbidity.

### **Patients and methods**

Between 1995 and 2004, 93 consecutive patients that were admitted as an emergency as a result of recurrent abdominal cancers to our department were retrospectively evaluated. Of these 93 patients, 81(87%) were operated on, whereas 12 were treated conservatively. This latter group was excluded from the analysis and hence the final sample comprised of 81 patients.

Clinical records, operative notes and histological examinations were retrospectively reviewed. APACHE II scores were calculated for all patients. All surgeries were performed within 24 hours from admission. Majority of the recurrences were from colon (32; 39.5%) followed by 13

(16 %) from stomach, 12 (14.8 %) from ovary, 8 (9.8%) from uterus, 6 (7.4%) from bladder, 4 (4.9%) from gallbladder, 3 (3.7 %) from kidney, 2 (2.4%) retroperitoneal sarcoma and one cancer of the anal canal.

The mean age was 70.1 years ranging from 48 to 96 years. The female/male ratio was 1.25. All patients underwent a detailed clinical examination followed by routine hematological and biochemical work-up. An erect and supine abdominal roentgenogram was obtained, followed by staging work-up.

After a detailed laparotomy surgery including radical resections or palliative resections (with documented metastasis or residual tumor), or palliative by-pass, and enterostomies were carried out.

The term radical resection was used when there was no microscopic disease foci left behind otherwise it was classified as palliative. In presence of metastatic disease too the resection was classified as palliative.

Postoperative morbidity, mortality (at 30 days) and survival after 2-year of follow-up was considered as end points. These end points were examined in terms of gender, cancer stage and type, symptoms, duration of symptoms, age, weight loss, mode of recurrence, anemia, serum albumin and Apache II scores. Duration of operation, blood loss, contamination, type of surgery and intra-operative transfusions were also considered. All the patients received adjuvant treatment as per the institutional protocol.

The statistical analysis was carried out using chi-square test (Fisher exact test when appropriate), Student- Newman- Keuls test. Survival was estimated using Kaplan-Meier method and differences in survival between groups was estimated using long-rank test.

### **Results**

Of the 81 patients treated by emergency surgery for recurrent abdominal cancer, 68 were obstructed, 10 were perforated and 3 subjects had an uncontrollable bleeding. A high-degree of obstruction was present in 48 (70.5%) patients. The preoperative Apache II score was higher than 10 in 66 subjects (81.4%). Patients who had undergone non resective procedures had a poor Apache II score ( $18.9 \pm 2.6$ ) compared to patients undergoing radical or palliative resections ( $10.6 \pm 1.7$ ;  $p < 0.05$ ).

For the patients presenting with bleeding a colonoscopy was performed but it failed to reach a diagnosis (1 patient had an ileal bleeding and in the other cases there were technical failures due to poor colon preparation).

Preoperative computed tomographic (CT) scan was performed in 71 cases (87%), a recurrence was suspected in majority of the patients, 55 (74%) of these had a palpable abdominal mass. A total of 31 (38.2%) patients underwent resections, 24 (29.6%) enterostomies, 15 (18.5%) intestinal by-passes and 11 (13.5%) exploratory laparotomy alone. Of the 31 surgical resective procedures only 13 (16%) were radical. The overall morbidity was 27.1%, while mortality was 11.1%. Univariate analysis of preoperative and operative factors affecting mortality and morbidity are shown in table 1. The Apache II score was the only statistically significant predictor affecting morbidity. ( $p < 0.05$ ). In all 9 patients died during 30-day postoperative period of these 3 died of respiratory insufficiency secondary to infection, 2 died from pulmonary embolism, 2 from multisystem organ failure and one each from acute myocardial infection and abdominal sepsis leading to fistula formation and death. The morbidity is detailed in table 2. Pulmonary and wound infections were the most common causes of morbidity, followed by intestinal fistula and wound dehiscence. Emergency resections carried the same risk of mortality and morbidity when compared to other surgical procedures ( $>0.05$ ) (Table 2).

The mean survival time was 21.3 months (95% CI 17.4–24.8) in patients undergoing radical resection while it was 15.3 months (95% CI 11.8–18.9) in palliative resections and 8 months (95% CI 6.1–9.8) for other procedures ( $p < 0.05$ ). Patients who underwent radical and palliative resections had a better 2-year survival when compared to patients submitted to other surgical procedures ( $p < 0.05$ ) (Figure 1 and 2).

## Discussion

Emergency surgery for abdominal cancer recurrence represents a challenge to surgeons.

Such operations are not only difficult they also carry a higher morbidity and mortality than other standard abdominal procedures [3]. Majority of these patients are severely debilitated. About 80% of our patients had an Apache II score of more than 10. Above all these patients have an advanced cancer with a limited life expectancy, and surgical intervention is unavoidable because of a life threatening situation. What should be the best surgical approach? Is an aggressive re-operative approach justified? What are the clinical risk factors affecting morbidity and mortality? All these questions need be answered before making a therapeutic decision. The extent of malignant disease must be evaluated before surgery: the metastatic disease often rules out a curative procedure. Peritoneal carcinomatosis is often difficult to diagnosis by imaging modalities and its presence too rules out a curative procedure.

Many authors suggest an aggressive surgical approach that may lead to an increased resectability rate but a significant number of patients will develop postoperative complications [4]. The effect of such an aggressive approach on the long-term outcome too is not clear except in ovarian cancer [6]. Survival benefit of debulking surgery results from radicality, avoidance of life threatening complications and treatment of these complications if they occur. In our series there were no differences in morbidity and mortality between resective (radical or palliative) and non resective procedures. Besides, survival was statistically better for patients submitted to resective (radical and palliative) procedures compared to non-resective procedures, even though radical resection was possible only in few cases.

A selection bias is evidenced from the results as the subjects were not randomized and patients with a limited disease have had a resective procedure. As a matter of fact the difference observed in survival of this group of patients is a reflection of the disease stage [7]. In the palliative resections group, the good result is probably due to the high percentage of ovarian cancers where the role of debulking surgery is well established [8]. As a matter of fact debulking operations for cancer are quite reasonable in order to provide the optimum volume of cytoreduction and perform chemo- and radiation treatment [3]. Palliative resection may also improve the quality of life by reducing the danger of other complications such as obstruction, bleeding and perforation. [9].

Endoscopic stents may be considered for palliation of selected patients excluded from resective operations [10], however, in an emergency setting it is not easy to decide which patient is not suitable for resective procedures. Not only in emergency setting but even other wise when a recurrence is diagnosed palliative resection of the tumor is indicated to improve the quality of the patient's remaining life by reducing the danger of acute complications [5].

According to the results of the present series, there is no difference in morbidity and mortality between bypass procedures and enterostomies, even though enterostomies seem to be somewhat safer. Nearly 14% of our cases underwent laparotomies alone, the morbidity concerning laparotomy is extremely high as these patients had very poor general conditions due to the advanced unresectable cancer. Laparoscopy may have a role under these circumstances. Position emission tomography (PET) has evolved as a useful strategy. Improved results can only be expected if more effective and sensitive diagnostic modalities are developed. However, in many cases even an intensive follow-up may not affect the long-term outcome of local recurrence [2].

**Table 1: Preoperative and operative factors affecting mortality and morbidity**

Clinical Factor	Subgroups	Morbidity	p	Mortality	p
Duration of symptoms	< 1 day	12/ 42 (28.5%)	n.s.	5/ 42 (11.9%)	n.s.
	1–3 days	6/ 25 (24%)	n.s.	3/ 25 (12%)	n.s.
	> 3 days	4/ 14 (28.5%)	n.s.	1/ 14 (7.1%)	n.s.
Gender	Female	11/36 (30.5%)	n.s.	3/36 (8.3%)	
	Male	11/45 (24.4%)		6/45 (13.3%)	
Age	< 50 yrs	3/ 12 (25%)	n.s.	1/12 (8.3%)	n.s.
	51–70 yrs	7/ 28 (25%)	n.s.	3/28 (10.7%)	n.s.
	> 70 yrs	12/ 41 (29.2%)	n.s.	5/41 (12.1%)	n.s.
Stage of the disease	No residual Ca	3/13 (23%)		0/13	
	Residual Ca	19/68 (27.9%)	n.s.	9/68 (13.2%)	n.s.
Mode of recurrence	Local	9/36 (25%)	n.s.	4/36 (11.1%)	n.s.
	Distant	8/30 (26.6%)	n.s.	3/30 (10%)	n.s.
	Metastasis	5/15 (33.3%)	n.s.	2/15 (13.3%)	n.s.
Cancer type	Colon	10/32 (31.2%)	n.s.	5/32 (15.6%)	n.s.
	Stomach	4/13 (30.7%)	n.s.	2/13 (15.3%)	n.s.
	Ovary	3/12 (25%)	n.s.	2/12 (16.6%)	n.s.
	Uterus	2/8 (25%)	n.s.		
	Bladder	2/6 (33.3%)	n.s.		
	Gallbladder	1/4 (25%)	n.s.		
	Preoperative symptoms	Obstruction	19/68 (27.9%)	n.s.	7/68 (10.2%)
	Perforation	2/10 (20%)	n.s.	2/10 (20%)	n.s.
	Bleeding	1/3 (33.3%)	n.s.	0/3 (0%)	n.s.
Apache II score	> 10	22/66 (33.3%)	<b>&lt; 0.05</b>	8/66 (12.1%)	n.s.
	< 10	0/15		1/15 (6.6%)	
Loss of weight	> 10 kg	8/25 (32%)	n.s.	2/25 (8%)	n.s.
	< 10 kg	14/56 (25%)		7/56 (12.5%)	
Preoperative albumin level	< 2 mg/dL	9/28 (32.1%)	n.s.	3/28 (10.7%)	n.s.
	> 2 mg/dL	13/53 (24.5%)		6/53 (11.3%)	
Anemia	< 10 mg/dL	9/29 (31%)	n.s.	3/29 (10.3%)	n.s.
	> 10 mg/ dL	13/52 (25%)		6/52 (11.5%)	
Operation time	< 120 min.	10/34 (29.4%)	n.s.	4/34 (11.7%)	n.s.
	> 120 min.	12/47 (25.5%)		5/47 (10.6%)	
Blood loss	> 500 cc	9/38 (23.6%)	n.s.	4/38 (10.5%)	n.s.
	< 500 cc	13/43 (30.2%)		5/43 (11.6%)	
Intraoperative transfusions	Yes	19/70 (27.1%)	n.s.	8/70 (11.4%)	n.s.
	No	3/11 (27.2%)		1/11 (9.0%)	
Contamination	Dirty	2/10 (20%)	n.s.	1/10 (10%)	n.s.
	Contaminated	17/60 (28.3%)		7/60 (11.6%)	
	Clean	3/11 (27.2%)		1/11 (9%)	
Operative Procedure	Resections	7/31 (22.5%)	n.s.	2/31 (6.4%)	n.s.
	Ex. Laparotomy	4/11 (36.3%)		2/11 (18.1%)	
	By-Pass	5/15 (33.3%)		2/15 (13.3%)	
	Enterostomy	6/24 (25%)		3/24 (12.5%)	

## Conclusions

To obtain the best survival for emergency surgery for recurrent abdominal cancer, contributory risk factors such as Apache II score must be weighed against possible benefits when deciding to operate on a patient. Resective surgery offers the best chance to improve survival in emergency surgery in these circumstances. If resection is not feasible, the possibility of creating a bypass or enterostomy should be considered to improve the patient's quality of life. Resectable recurrent cancer carries a good

outlook. The surgeon must evaluate patient's conditions to decide the extent of the operation [12].

## Competing interests

None declared.

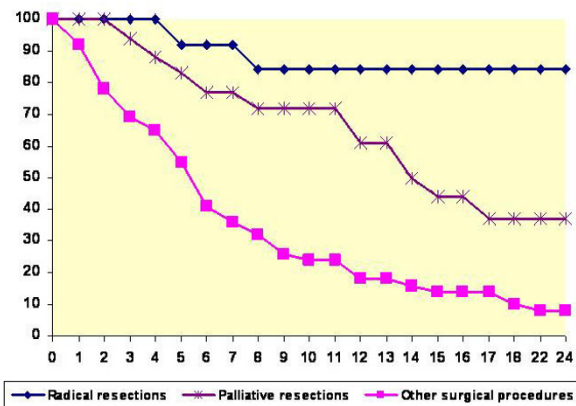
## Authors contributions

FC conceived the study and prepared the manuscript

**Table 2: Morbidity in pts submitted to emergency surgery for recurrent abdominal cancer**

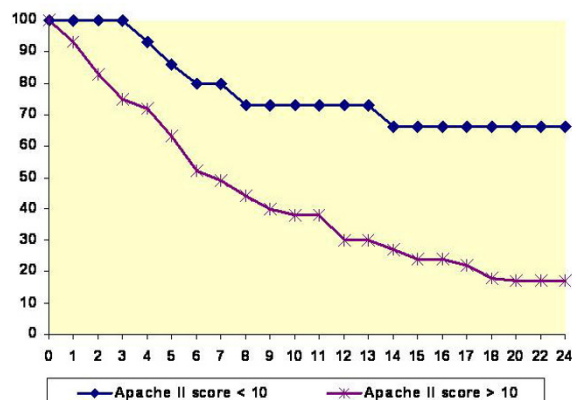
Complications	N°	%
Pulmonary infections	6	7.4
Wound infection	6	7.4
Wound dehiscence	2	2.4
Intestinal fistula	3	3.7
AMI	2	2.4
Pulmonary embolus	2	2.4
Abdominal bleeding	1	1.2
Early re-obstruction	1	1.2
Intrabdominal infection	1	1.2
MOF	1	1.2
Cerebral vascular accident	1	1.2
Stomal necrosis	1	1.2
Overall*	22*	27.1

\*5 patients had more than 1 complication



**Figure 1**  
Survival after radical and palliative resections versus other surgical procedures in patients undergoing emergency surgery for recurrent abdominal cancers. Radical resections Mean Survival Time = 21.3; 95% CI intervals (17.86–24.75); Palliative resections Mean Survival Time = 15.3; 95% CI intervals (11.74–18.89); other surgical procedures Mean Survival Time = 7.98; 95% CI intervals (6.12–9.84). p < 0.05 radical and palliative resections versus other surgical procedures and palliative versus radical resections.

FG, SA, LA and ADC carried out the retrospective collection and analysis of data and helped in preparation of the manuscript.



**Figure 2**  
Survival by preoperative Apache II Scores. Apache II score < 10 Mean Survival Time = 18.4; 95% CI intervals (14.37–22.56); Apache II score > 10 Mean Survival Time = 10.2; 95% CI intervals (8.30–12.12), p < 0.05 patients with APACHE II score < 10 vs. patients with Apache II score > 10

LD and MT participated in the design of the study, and edited the manuscript for its scientific content.

All authors have read and approved the final version of the manuscript.

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