

Emergency bowel surgery in the elderly

Yaşlılarda acil barsak cerrahisi

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Background/aims: Emergency bowel operations are commonly performed in emergency units and carry high morbidity and mortality risk, particularly in elderly patients. The aim of the present study was to review the presentation, management and outcome of bowel emergencies in elderly patients. **Methods:** The records of 248 patients (91 females, 157 males) aged over 65 years, undergoing emergency bowel operation during a five-year period, were reviewed. Patient's age, sex, details of presentation, past medical history, presence of coexisting diseases, and type of surgical procedures were noted, and their effects/any unfavorable outcomes were all analyzed. Data were evaluated by using SPSS 9.0 for Windows statistical program. A p value less than 0.05 was accepted as significant. **Results:** Mean age was 72.5 years. There were 85 (34%) isolated small bowel emergencies (SBE) and 153 (62%) isolated large bowel emergencies (LBE). The most common disease in SBE was mesenteric ischemia in 67 (27%), followed by adhesions, 26 (10%). Malignant bowel disease in 59 (24%) and sigmoid volvulus in 43 (17%) accounted for the majority of LBE. Sixty-five percent (161) of patients presented with obstruction and 46 (19%) patients had bowel perforation. Malignant disease, volvulus and mesenteric ischemia carried high resection rates (82%, 78% and 76%, respectively). Overall morbidity and mortality rates were 42% (105) and 28% (70), respectively. **Conclusions:** Emergency bowel operations have poor outcome in the elderly. Nature and extent of disease, presence of coexisting cardiopulmonary disease, late admission and presence of peritonitis significantly affect management and outcome of elderly patients with bowel emergencies.

Key words: Emergency surgery, bowel, elderly

Amaç: Acil barsak ameliyatlari; acil servislerde sıklıkla uygulanan prosedürlere birisi olup, yaşlılarda yüksek morbidite ve mortalite riski taşırlar. **Yöntem:** Beş yıllık bir dönemde acil barsak ameliyatı geçirmiş 65 ve daha yaşlı 91'i kadın 248 hastanın kayıtları retrospektif incelendi. Hastalara ait yaş, cinsiyet, başvuru özellikleri, anamnez, yandaş hastalık, yapılan ameliyat tipleri kaydedilerek, sonuçları etkileyen olumsuz faktörler analiz edildi. Sonuçlar SPSS 9.0 Windows istatistik programı ile değerlendirildi, p<0.05 değerler anlamlı olarak kabul edildi. **Bulgular:** Hastaların ortalama yaşı 72.5 idi. Olguların %34 (85)'ünde izole ince barsak hastalığı, %62 (153)'sini izole kalın barsak acilleri oluşturdu. En sık görülen acil ince barsak problemi akut mezenterik iskemi %27 (67) olup, bunu intestinal yapışıklıklar izledi. Malign barsak hastalıkları %24 (59) ve sigmoid volvulus %17 (43)'e sık görülen acil kalın barsak olgularıydı. Barsak obstrüksiyonları %65 (161), barsak perforasyonları %19 (46) olguda tesbit edildi. Malign barsak hastalıklarında, volvuluslarda ve mezenter iskemi olgularında yüksek rezeksiyon oranları (sırasıyla %82, %78 ve %76) gözlemlendi. Postoperatif komplikasyon oranı %42 (105), mortalite oranı ise %28 (70) bulundu. **Sonuç:** Yaşlılarda acil barsak ameliyatlarının prognozu iyi değildir. Hastalığın natürel, tutulum genişliği, yandaş kardiyopulmoner hastalık varlığı, geç başvuru ve peritonit varlığı olumsuz prognostik faktörlerdir.

Anahtar kelimeler: Acil cerrahi, barsak, yaşlılık

INTRODUCTION

Advances in health care and rapid evolution of preventive medicine have resulted in a greater proportion of the population surviving to advanced age (1, 2). Those older than 65 years constitute 14% of the United States population and will account for about 20% in the next half century (3). Twenty-eight percent of the Western European population has already been defined as older than 75 years (2). Currently one in four surgical patients are over the age of 65 years, and half of the

individuals older than 65 years will undergo an operation during the remainder of their lifetime (3).

It is well known that increasing age seems to have adverse effect on the outcome of surgery (4). Many studies have shown that the results of elective surgery in elderly patients seem largely favorable, while those of emergency surgery are not (1). Almost regardless of the type of procedure, emergency surgery is associated with a three-fold

increase in mortality and morbidity (5). Emergency bowel operations also require an extended hospital stay and greater need for postoperative intensive care in the elderly patients (1, 6).

The purpose of this study was to review the current patterns, managements and outcomes of bowel emergencies in the elderly patients in our institution.

MATERIALS AND METHODS

The records of 248 patients aged over 65 years who underwent emergency operation for bowel emergency from January 1997 to December 2002 in the Surgical Emergency Unit of Ankara Numune Hospital, a major teaching hospital in Turkey, were reviewed.

Data recorded included: Patient's age, sex, details of presentation, past medical history, cause of bowel emergency, presence of coexisting diseases such as cardiopulmonary disease, hypertension, diabetes, prostate enlargement etc. and the type of surgical procedures. Their effects on postoperative complications, hospital stay and mortality were compared.

The results were analyzed statistically using SPSS for Windows program (SPSS, Chicago, Illinois, USA). Statistics for 2x2 grids were done by using chi-square test with Yates' correction. Comparisons between means were done with Student's t test, and p values less than 0.05 were considered as significant.

RESULTS

A total of 248 patients (157 males, 91 females) were operated on during a five-year period. The mean age was 72.5 years, ranging from 65 to 97 years. There were 85 (34%) isolated small bowel emergencies (SBE), and 153 (62%) isolated large

bowel emergencies (LBE). The remaining patients, 10 (4%), had combined bowel emergencies. Mesenteric ischemia was the most common cause of SBE, and accounted for 27% (67) of cases. Adhesion was the second common cause of SBE and comprised 10% (26) of cases. Of all patients, 151 (61%) patients admitted to hospital 48 hours or more from the onset of symptoms. Delayed presentation was significantly ($p<0.001$) more common in the patients with malignant bowel disease. Only in the patients with mesenteric ischemia were morbidity (24/46) and mortality (22/44) rates significantly correlated with late admission ($p=0.01$ and $p=0.003$, respectively).

Serious coexisting diseases were noted in 48% (119) of the patients. Congestive heart failure ($n=39$), chronic obstructive pulmonary diseases ($n=23$), previous myocardial infarction ($n=14$), hypertension ($n=35$) and diabetes mellitus ($n=18$) were common coexisting problems. Serious cardiopulmonary coexisting problems were significantly ($p<0.001$) more common in the patients with mesenteric ischemia. Presence of cardiopulmonary coexisting disease was associated with significantly higher incidence of postoperative complication and death (Table 1). shows the causes of bowel emergencies and presentation details.

One hundred and sixty-one (65%) patients were hospitalized for mechanical bowel obstruction. Malignant bowel disease was the most common cause of bowel obstruction in the elderly patients, followed by volvulus (37% and 35%, respectively). Bowel perforation was observed in 46 (19%) patients. Malignant bowel disease was the most common (35%) cause of perforation in this group of patients, followed by inflammatory bowel disease (24%). Bowel perforations caused generalized peritonitis in 39 (9%) patients. Patients with genera-

Table 1. The causes of bowel emergencies and presentation details

Causes of Bowel Emergency	Number of Patients	Male/Female Ratio	Delayed Admission	Coexisting Disease
Malignant Bowel Disease	71(29%)	38/33	57(81%)	34(48%)
Mesenteric Ischemia	67(27%)	37/30	28(42%)	52(78%)
Volvulus & Torsion	59(24%)	48/11	36(60%)	19(32%)
Adhesions	26(10%)	17/9	17(65%)	6 (25%)
Inflammatory Bowel Disease	18(7%)	12/6	9(50%)	7(40%)
Miscellaneous	7(3%)	5/2	4(57%)	1(14%)

Table 2. The distribution of bowel obstructions, bowel perforations and bowel resection rates

Causes of Bowel Emergencies	Bowel Obstruction	Bowel Perforation	Bowel Resection
	161(65%)	46(19%)	180(73%)
Malignant Bowel Disease	60(85%)	16(23%)	58(82%)
Mesenteric Ischemia	10(15%)	7(11%)	51(76%)
Volvulus	57(97%)	3(5%)	46(78%)
Adhesion	24(92%)	9(27%)	9(35%)
Inflammatory Bowel Disease	6(33%)	11(61%)	9(50%)
Miscellaneous	4(15%)	-	7(50%)

lized peritonitis had significantly higher morbidity and mortality rates (62% and 36%, respectively). Necrotic bowel resection was performed in 180 (73%) patients. Malignant bowel disease, mesenteric ischemia and sigmoid volvulus carried high resection rates (82%, 76% and 78%, respectively). Bowel resection rates together with the causes of obstruction and perforation are detailed in (Table 2).

Sixteen (24%) of the patients with mesenteric ischemia and 5 (7%) of the patients with malignant bowel disease were found to be inoperable on emergency abdominal exploration. Bowel resection and primary anastomosis were carried out in 115 (46%) patients; bowel resection with stoma procedure was performed in 65 (26%) patients. Bowel resection and stoma procedures were associated with significantly higher morbidity and mortality rates. Types of surgical procedures for bowel emergencies in the elderly patients are shown in (Table 3).

Iatrogenic bowel perforation was the most common intraoperative complication in 17 (4%) patients. It was noted in 9 (15%) patients with mesenteric ischemia and in 8 (12%) patients with malignant bowel disease.

Overall postoperative complication rate was 42% (105). Cardiopulmonary insufficiency, adult respiratory distress syndrome, pulmonary infections, myocardial infarction, renal failure, wound infection and dehiscence were common postoperative complications. Severe postoperative complications were most frequently encountered in patients with mesenteric ischemia. Bogotas' bag applications and second look laparotomies were also common and applied in 9 (13%) of those with mesenteric ischemia. Emergency surgical treatment of the patients with inflammatory bowel diseases also had a high postoperative complication rate. Incidence of postoperative complications is listed in (Table 4).

The overall mean hospital stay was 8.9 days (range 0-55 days). Malignant bowel emergencies required significantly ($p < 0.001$) longer hospitalization.

Postoperative mortality was recorded in 70 (28%) patients. Cardiopulmonary insufficiency was responsible for the deaths of 26 (37%) patients. Adult respiratory distress syndrome resulted in death in 11 (16%) patients. Sepsis and multiorgan failure was the cause of death in 15 (21%) patients. Renal failure was responsible for 5 (7%) deaths. The highest mortality rate was noted in patients with mesenteric ischemia (66%). Malignant bowel emer-

Table 3. Surgical procedures for bowel emergencies in elderly patients

Bowel Emergency	Resection & Anastomosis	Resection & Stoma	Only Stoma	Others
Malignant Bowel Disease	30 (42%)	28 (40%)	6 (8%)	5 (7%) Inoperable
Mesenteric Ischemia	43 (64%)	8 (12%)	-	16 (24%) Inoperable
Volvulus	25 (42%)	21 (36%)	-	13 (22%) Detorsion
Adhesion	8 (31%)	1 (3%)	-	175%) Adhesiolysis
Inflammatory Bowel Disease	5 (28%)	4 (22%)	2 (11%)	7 (39%) Abscess Drainage
Miscellaneous	4 (31%)	3 (19%)	-	-

Table 4. Incidence of postoperative complications

Type of Complication	Incidence	Mortality	% of all cases
Cardiopulmonary Insufficiency	32	26	13%
Adult Respiratory Distress	16	11	6 %
Pulmonary Infections	7	4	2.8%
Myocardial Infarction	4	4	1.6%
Cardiac Dysrhythmia	2	1	0.8%
Renal Failure	7	5	2.8%
Wound Dehiscence	3	-	1.2%
Wound Infection	4	-	1.6%
Intraabdominal Abscess	5	1	2%
Adhesion	2	-	0.8%
Sepsis and MOS	17	15	7%
Anastomotic Leak	5	2	2%
Intestinal Ischemia	1	1	0.4%

Table 5. Morbidity and mortality rates of bowel emergencies in elderly patients

Causes of Bowel Emergency	Morbidity	Mortality
Malignant Bowel Disease	23 (32%)	16 (23%)
Mesenteric Ischemia	46 (69%)	44 (66%)
Volvulus & Torsion	18 (30%)	5 (8%)
Adhesions	8 (31%)	2 (8%)
Inflammatory Bowel Disease	8 (46%)	3 (16%)
Miscellaneous	2 (28%)	-

gencies also have a high mortality rate (22%). Morbidity and mortality rates are shown in (Table 5).

The effects of factors that may be related with unfavorable outcomes were analyzed statistically and are detailed in (Table 6).

ased percentage of operations in elderly patients is not only due to the increase in the number of older patients, but also a reflection of a reluctance to offer surgical treatment to the elderly (4). Nearly 50% of surgical admissions in this age group will be as an emergency (1).

Despite advances in perioperative care, emergency operations on elderly patients are still challenging problems for surgeons because of the high morbidity and mortality risk. Previous studies have showed that mortality rates in elderly patients who underwent emergency operation consistently ranged between 20% and 37%. Morbidity varies between 10% and 58% (7). In our series morbidity and mortality rates were 28% and 42%, respectively.

Many factors are likely to be responsible for poor outcomes (8). It is widely accepted that emergency surgery increases the morbidity and mortality in the elderly (8). Elderly patients are more vulnerable to emergency operations because of the overall decline in physiologic reserve (4, 7). The pre-operative incidence of coexisting diseases rose steadily with age and only 5% of the patients had no comorbid illnesses in the eighth decade (5). Many authors have shown that most deaths after emergency surgery resulted from complications of co-existing cardiovascular or respiratory diseases or thrombo-embolic complications (2, 9). In the present series, 65% of all deaths were due to cardiac

Table 6. Statistical (unvaried) analyses of factors responsible for unfavorable outcomes

Factors	Morbidity	Mortality	Longer hospitalization (>10 days)
Coexisting disease (cardiopulmonary)	p<0.001 64% vs. 20%	p<0.001 49% vs. 14%	p<0.005 42% vs. 19%
Delayed admission >48 hours (mesenteric ischemia)	p<0.005 85% vs. 51%	p<0.05 50% vs. 22%	NS*
Presence of peritonitis (generalized)	p<0.004 68% vs. 39%	p<0.001 50% vs. 22%	p<0.02 46% vs. 21%
Presence of bowel resection	NS	NS	p<0.001 43% vs. 23%
Type of operation (resection & stoma)	NS	NS	p=0.008 46% vs. 22%
Nature and extent of b.d.# (ischemic or malignant)	p<0.001 69% vs. 32%	p<0.001 66% vs. 32% 23% vs. 16%	p<0.008 46% vs. 31% 40% vs. 26%

*NS: non significant, #b.d: bowel disease.

DISCUSSION

As the population ages, increasing numbers of elderly people will present for surgery (3). From 1980 to 1996, the percentage of operations in elderly patients increased from 19% to 36%. Incre-

and respiratory complications. Morbidity and mortality rates and length of hospital stay were significantly influenced by presence of coexisting cardiopulmonary diseases.

The relationship between delay in operation and

the development of complications has been previously reported, particularly in elderly patients with incarcerated hernia or small bowel obstruction. It has also been previously reported that delay over 24 hours increases hospital stay by an average of one week (10, 11). In our series delay in operation was entirely due to late admission. Although there was no significant correlation between delayed presentation and length of hospital stay, morbidity and mortality were significantly correlated with late admission in the patients with mesenteric ischemia.

In our series, a majority (65%) of the elderly patients admitted to emergency unit with the complaints of bowel obstruction. Emergency presentations of colorectal cancers are common surgical problems in the elderly and carry high perioperative mortality risk. Irvin and Waldron et al. (9,12) have reported perioperative mortality rates of 16% and 38%, respectively. In the present study, colorectal cancers comprised the most common cause of bowel emergencies. The perioperative mortality rate was 22% and was frequently associated with perforation and peritonitis. Presence of intra-abdominal sepsis and coexisting cardiopulmonary diseases accounted for deaths. Similar findings have also been suggested in previous reports (12, 14).

Primary resection with anastomosis was our procedure of choice in the elderly patients with necrotic bowel. However, in the presence of generalized peritonitis or gross peritoneal contamination, resection and stoma was the procedure of choice. According to McIntyre et al. (1) mortality seems to be

related to the severity and nature of the surgical condition. The surgical procedure carried out does not influence the outcome for a given condition. Karanikas et al. (2) have recommended that conservative surgery should be performed in elderly patients who have serious concomitant problems. In our series, type of surgical procedure and presence of bowel resection seemed to be related with unfavorable outcomes.

Our experience demonstrates that colorectal cancer is the most common cause of bowel obstruction in elderly patients, followed by sigmoid volvulus. Acute mesenteric ischemia is the most serious emergency problem for the elderly patient because of its high morbidity and mortality rate.

Delayed admission, nature and extent of bowel disease, presence of coexisting cardiopulmonary disease, presence of generalized peritonitis, requirement of bowel resection and the procedure of choice significantly affect the outcomes of emergency surgical treatment in elderly patients. Definitive surgery may be performed safely in selected elderly patients. It is wise to perform conservative surgery in geriatric patients with coexisting unsuitable factors as mentioned above. Early diagnosis accompanied by timely elective surgery is the best and most cost-effective treatment.

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REFERENCES

- McIntyre R, Reinbach D, Cushieri RJ. Emergency abdominal surgery in the elderly. *JR Coll Surg Edinb* 1997; 42: 1738.
- Karanikas IO, Liakakos TD, Koundourakis SS, et al. Emergency operations in the elderly: management of outcome. *Int Surg* 1996; 81: 158-62.
- Oskvig RM. Special problems in the elderly. *Chest* 1999; 115 (suppl): 158-64.
- Rosenthal RA, Zenilman ME. Surgery in the elderly. In: *The Biological Basis of Modern Surgical Practice*. Townsend CM, Beauchamp RD, Evers MB, Mattox KL (eds). 16th ed. Philadelphia: WB Saunders; 2001:226-46.
- Rosenthal RA, Andersen DK. Physiologic considerations in the elderly surgical patient. In: *Modern Surgical Care*. Miller TA (ed). 2nd ed. St Louis, MO: Quality Medical Publishing Inc; 1998: 1362-84.
- Mendes da Costa PR, Lurquin P. Gastrointestinal surgery in the aged. *Br J Surg* 1993; 80: 329.
- Keller SM, Markowitz LJ, Wilder JR, Aufses AH. Emergency and elective surgery in patients over age 70. *Am Surg* 1987; 53: 636-40.
- Seymour DG, Pringle R. Post-operative complications in the elderly surgical patient. *Gerontology* 1983;29:262-70.
- Irvin TT. Prognosis of colorectal cancer in the elderly. *Br J Surg* 1988; 75: 419-21.
- Bender JS, Busuito MJ, Graham C, et al. Small bowel obstruction in the elderly. *Am Surg* 1989; 55: 385-8.
- Andrews NJ. Presentation and outcome of strangulated external hernia in a district general hospital. *Br J Surg* 1981; 68: 329-32.
- Waldron RP, Donovan IA, Drumm J, et al. Emergency presentation and mortality from colorectal cancer in the elderly. *Br J Surg* 1986; 73: 2214-6.
- Kyllonen LEJ. Obstruction and perforation complicating colorectal carcinoma. *Acta Chir Scand* 1987;153:607-14.
- Runkel NS, Schlag P, Schwarz V, et al. Outcome after emergency surgery for cancer of the large intestine. *Br J Surg* 1991; 78: 183-8.