

Abdominal surgical emergency in the elderly

Yaşlılardaki abdominal cerrahi aciller

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Background/aims: Longer life expectancy has created an increasing demand for surgical care of the elderly. Abdominal surgical emergencies are potentially serious and life-threatening conditions for this group of patients. The aim of this study was to evaluate the records of elderly patients undergoing emergency surgical treatment. **Methods:** A total of 181 patients aged 60 years and above who had undergone emergency surgical interventions were retrospectively analysed according to demographic features, indications for emergency surgery, postoperative clinical course and outcome. **Results:** Sixty-one percent of the patients were male, with an average age of 70.3 (range 60-95) years. Octogenarians constituted 19% of our series. Causes of surgical emergency were acute cholecystitis (31.5%), strangulated hernia (18.2%), hollow viscus perforation (17.1%), bowel obstruction (10.5%), acute mesenteric ischaemia (9.4%), acute appendicitis (8.3%) and upper gastrointestinal haemorrhage (5%). Gallstones had been previously detected by ultrasound in 25 (45.5%) of 55 patients with acute calculous cholecystitis. Thirty (93.8%) of 32 patients were aware of their external hernias prior to incarceration. Twenty seven patients (14.4%) died in the early postoperative period, with acute mesenteric vascular occlusion being the leading cause of death: A higher mortality rate was noted in mesenteric ischaemia (76.5%), gastrointestinal bleeding (22.2%) and in perforation (19.4%) cases, being 36.8% (21/57) in patients with these three severe conditions and 4.8% (6/124) in the remaining patients. **Conclusions:** Acute calculous cholecystitis and external strangulated hernias, which are generally preventable, were the most common surgical emergencies. Surgical treatment of acute mesenteric ischaemia, gastrointestinal haemorrhage and peritonitis secondary to free perforation had a worse prognosis in older patients.

Key words: Advanced age, surgery, acute abdomen, emergency, morbidity, mortality.

Amaç: Ortalama yaşam süresinin uzamasına bağlı olarak cerrahi girişim gereken yaşlı insan sayısı artmaktadır. Abdominal cerrahi aciller yaşlılar için ciddi ve yaşamı tehdit eden durumlar olabilmektedir. Bu çalışmanın amacı acil cerrahi girişim uygulanan yaşlı olgulardaki sonuçlarımızı bildirmektir. **Yöntem:** Acil cerrahi girişim uygulanan 181 yaşlı olgu (60 yaş ve üzeri), demografik özellikleri, acil cerrahi indikasyonlar, postoperatif klinik seyir ve akıbetleri açısından geriye dönük olarak incelendi. **Bulgular:** Olgularımızın % 61'i erkek ve ortalama yaş 70.3 (60-95) bulundu. Serimizin %19'unu seksen yaş üzerindeki oluşturdular. Acil ameliyat indikasyonları akut kolesistit (%31.5), inkarsere fıtıklar (%18.2), içi boş organ delinmesi (%17.1), barsak tıkanması (%10.5), akut mezenter iskemi (%9.4), üst gastrointestinal kanama (%5) olarak saptandı. Akut taşlı kolesistitli olguların %45.5'inde safra taşları ultrason ile daha önceden tespit edilmişti. Fıtık olgularının %93.8'i inkarasyon öncesi dış karın fıtığı varlığından haberdardı. Erken postoperatif dönemde 27 (%14.4) olgu öldü. Ölen olgularda önde gelen neden mezenterik damar tıkanmasıydı. Mezenter iskemi (%76.5), gastrointestinal kanama (%22.2), ve perforasyonlu (%19.4) olgularda yüksek mortalite gözlemlendi. Bu üç hastalık grubuna dahil olgularda ortalama mortalite %36.8 (21/57) iken diğer olgularda %4.8 (6/124) olarak bulundu. **Sonuç:** Akut taşlı kolesistit ve inkarsere dış fıtıklar yaşlı grupta sık rastlanan ve önlenabilir cerrahi aciller olarak görüldü. Akut mezenter iskemi, gastrointestinal kanama ve serbest perforasyona bağlı peritonit cerrahi tedavisi prognozunu yaşlı olgularda kötü olduğu sonucuna varıldı.

Anahtar kelimeler: İleri yaş, cerrahi, akut karın, acil, mobidite, mortalite.

INTRODUCTION

The causes, frequency and consequences of non-traumatic abdominal surgical emergencies differ greatly according to patient age. Emergency surgery may be life threatening for the older person with a severe concomitant systemic disorder and this abdominal emergency merits more careful evaluation than in the younger patient. In the second half of this century, life expectancy has increased significantly and it may consequently be

expected that demand for surgical care of the elderly is rising and will rise in the future (1-6). Today's surgeons must be more familiar with the increasing number of surgical conditions of the elderly and those dealing with abdominal surgery should have special interest, knowledge and experience of the elderly with surgical emergencies. In this study, the outcome of emergency abdominal surgery in the elderly is presented.

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Table 1. Demographic features of patients.

Age groups	Patients	Mean age	Male	Female
60-79	147 (81)*	67.2	94 (64)	53 (36)
+80	34 (19)	84	16 (47)	18 (53)
Total	181 (100)	70.3	110 (61)	71 (39)

p<0.05

*Numbers in parentheses are percentages.

MATERIALS AND METHODS

A review of operative records was undertaken in order to determine older patients (60 years of age and above) who had undergone emergency abdominal surgery. Between January 1995 and August 2000, 203 elderly patients were found to have undergone emergency abdominal surgery. When the records of these patients were retrospectively evaluated, 181 cases were found to have satisfactory data and were included in the study. They were divided into two age groups: between 60 and 79 years and 80 years and above. Demographic features, indications for surgery, postoperative clinical course, morbidity and mortality were analysed as main criteria. Statistical analysis was performed using Fisher's exact test and probability of less than 0.05 was accepted as significant.

RESULTS

The mean age of patients was 70.3 (range 60-95) years; 19% of the cases were 80 years and above and men constituted 61% of the series. There were significant gender difference between the two groups; females outnumbered males in octogenarians in contrast to the 60-79 years group (Table 1). Two leading causes (50%) of surgical emergency were acute cholecystitis and strangulated hernias

(Table 2). Two cases (3.5%) of acute cholecystitis were acalculous. These two patients were over 80 years old, and the rate of acalculous cholecystitis was thus 18% (2/11) in octogenarians. Twenty five of 55 (45.5%) patients with acute calculous cholecystitis had previous ultrasonic confirmation of gallstones. The entrapped bowel segment was gangrenous in two (6%) strangulated hernia cases and 30 of 32 (93.8%) hernia patients were already aware of the presence of their external abdominal hernia. Six (40%) of 15 acute appendicitis cases were perforated. The cause of upper gastrointestinal haemorrhage was peptic ulcer in six and erosive gastritis in three patients. Duodenal ulcer constituted 71% of hollow viscus perforations and the site of mechanical obstruction was the large bowel in 63% of such cases. Bowel necrosis occurred mainly in the small bowel and in the right colon in 10 (52.8%) of 17 patients with mesenteric vascular occlusion (Table 3). A total of 201 emergency operations were performed on 181 patients and 20 patients requiring repeated surgery were as follows: eight planned second look and two planned third look in patients with vascular occlusion and 10 operations for treatment of postoperative complications. The length of hospital stay was 13 (five to 40) days for living patients. Twenty seven (14.4%) patients died during the early postoperative period with the leading cause of surgical emergency being mesenteric vascular occlusion (48.2%) in these patients (Table 4). It was found that mesenteric vascular occlusion, gastrointestinal bleeding and hollow viscus perforation constituted 30% of our series and 77.8% of fatal cases. Twenty one (37%) of 57 patients with these three serious diseases died, while the mortality rate was 4.8% (6/124; p<10-6) in the remaining majority of our cases.

Table 2. Indications for emergency abdominal surgery.

Indications	Patients (n:181)	Age 60-79 (n:147)	Age 80+ (n:34)
Acute cholecystitis	57 (31.5)*	46 (31.3)	11 (32.4)
Strangulated hernia	33 (18.2)	24 (16.3)	9 (26.5)
Hollow viscus perforation	31 (17.1)	24 (16.3)	7 (20.6)
Mechanical bowel obstruction	19 (10.5)	15 (10.2)	4 (11.7)
Mesenteric vascular occlusion	17 (9.4)	16 (10.9)	1 (2.9)
Acute appendicitis	15 (8.3)	13 (8.8)	2 (5.9)
Upper GIS haemorrhage	9 (5)	9 (6.2)	--

*Numbers in parentheses are percentages.

Table 3. Detailed analysis of four common causes of abdominal surgical emergency.

<i>Incarcerated H. (n:33)</i>	<i>Hollow viscus perf. (n:31)</i>	<i>Bowel obstruction (n:19)</i>	<i>Vascular occlusion(n:17)</i>
Inguinal 19 (57)* (58.8)	Duodenal ulcer 22 (71)	Adhesions 6 (31.6)	Small+large bowel 10
Femoral 5 (15) (35.3)	Colonic malignancy 3 (9.6)	Sigmoid volvulus 6 (31.6)	Small bowel 6
Umbilical 5 (15) (5.9)	Colonic diverticulitis 3 (9.6)	Colonic malignancy 6 (31.6)	Left colon 1
Incisional 2 (6.5)	Gastric malignancy 2 (6.5)	Bezoar 1 (5.2)	
Epigastric 2 (6.5)	Gastric ulcer 1 (3.3)		

*Numbers in parentheses are percentages.

DISCUSSION

This series reveals that over a five year period a considerable number of older patients needed emergency abdominal surgery. The number of elderly people requiring surgical management is continuously rising, secondary to the significant increase in life expectancy in recent times. Surgery in the elderly is therefore outlined in a separate chapter in recent textbooks. In general, 65 years of age is accepted as a baseline for geriatric surgery (7). Surgery may be performed on the elderly in an unfavourable clinical situation in an emergency and the consequent increase in operative and postoperative morbidity considerably affects the patients' clinical course and outcome. The present study showed that male patients underwent emergency abdominal surgery more frequently in this population, while females were a majority in octogenarians. This finding may be explained by the longer average lifespan of women than men. A previous report confirmed that the proportion of males is decreasing in octogenarian patients (6). Isbister (8) has also reported that

women comprised 44% of patients younger than 50 years and 56% of those older than 80 years.

Acute calculous cholecystitis is the most common indication for surgery in both age groups. Previous studies have also reported our finding that acute biliary diseases are leading causes of abdominal emergency in the elderly (9,10), with acute cholecystitis accounting for up to 36% (17-36%) of cases in the spectrum of gallstone disease (11-14). Gallstones had been previously detected in approximately half of our patients with calculous cholecystitis, which indicates the need to focus attention on elective surgery of cholelithiasis. The diagnosis and elective removal of symptomatic gallbladders containing stones may result in a clear reduction in the rate of acute infectious complications due to gallstones in older people. Glaskow et al (11) has reported that over half of patients requiring cholecystectomy for complications initially presented with biliary colic and had ultrasonic confirmation of gallstones. They concluded that complications of gallstone disease are common and potentially preventable. Our results support the argument that the high frequency of acute cholecystitis in older people must be taken into account when evaluating the need for elective cholecystectomy. Removal of gallbladders at a proper time following diagnosis of symptomatic gallstones eliminates the need for surgery in advanced age for complications of cholelithiasis (15).

Strangulated hernia takes second place in surgical emergencies of older patients and its rate rises significantly in octogenarians. Its frequency was reported as 10 to 25% in previous studies, with an even higher rate of 36.4% among surgical emergencies in nonagenarian patients (5,9,10). The great majority of our patients were aware of the presence of an external hernia for a long time before the occurrence of strangulation which sug-

Table 4. Mortality in elderly patients with surgical emergency.

<i>Abdominal emergency</i>	<i>Mortality</i>	<i>Rate in fatal cases</i>
Vascular occlusion (n:17)	13 (76.5%)	13 (48.2%)
Upper GI haemorrhage (n:9)	2 (22.2%)	2 (7.4%)
Hollow viscus perforation (n:31)	6 (19.4%)	6 (22.2%)
Duodenal ulcer (n:22)	4 (18.2%)	
Tumour perf. (n:5)	2 (40%)	
Strangulated hernia (n:33)	2 (6%)	2 (7.4%)
Acute cholecystitis (n:57)	3 (5.3%)	3 (11.1%)
Bowel obstruction (n:19)	1 (5.3%)	1 (3.7%)
Total (n:181)	27 (14.4%)	27 (100%)

gests that irreducible hernia is a preventable surgical emergency. Elective surgical management of abdominal hernias at an appropriate time prevents an emergency in the majority of hernia cases. Fortunately, there was a low incidence of necrosis entrapped bowel segment in our series. Adesunkami *et al* (16) reported that 25% of hernias presented with strangulation and 14% contained gangrenous bowel segments, mortality occurring mainly in elderly patients.

Hollow viscus perforations are another common group of surgical emergencies in older people. While the leading cause was peptic ulcer, perforations of gastrointestinal malignancies and colonic diverticulitis also appeared as age-related causes of secondary peritonitis in our elderly patients. Complicated malignant neoplasm was identified more frequently with advanced age (1-3,9,10), while diverticulitis of the colon was also encountered more commonly in the elderly (17). Our evaluation of the clinical course revealed that tumour perforations have a worse progress and outcome. Free perforations into the peritoneal cavity and abdominal sepsis still carry a considerably high rate of mortality in advanced age. Older patients with secondary peritonitis extending over the entire abdomen and a greater degree of physiologic compromise are at higher risk for complications and mortality (18).

Mechanical obstructions constituted an important group in this study. It was recently reported that the frequency of intestinal obstructions is 15 to 20% in the elderly with surgical emergency (2,5,10). Our most significant finding was the frequency of colonic obstruction. In general, small bowel obstruction due to postoperative adhesions is the leading cause of intestinal obstruction but in this study, it was observed that in older people, large bowel obstruction accounted for two-thirds of cases. Obstructive malignancies have been reported as an advanced age-related pathology in many previous series (2,3,9). Another important finding in this study was the significance of geographical region. Volvulus was the main cause of bowel obstruction in older people of Turkey in contrast to Western Countries. Consequently, obstructive tumours and sigmoid volvulus increase the frequency of colonic obstruction in our elderly patients.

Mesenteric vascular occlusion is an expected surgical emergency in the elderly, especially in those with cardiovascular disorders. Findings of the present study and other recent reports have shown the frequency of acute mesenteric ischaemia to be under 10% (9,10). The clinical course and outcome

is disastrous and worse than any other abdominal emergency. In this study, bowel necrosis after vascular occlusion was fifth in terms of incidence but first in mortality among surgical emergencies. A group of our patients (four cases) were cardiovascular surgery cases and presented with complications following previous surgery. The incidence of abdominal complications after cardiac and pulmonary surgery is low but associated with high mortality. Simic *et al* (19) reported a 1.4% incidence of abdominal complications after cardiac surgery and 12% of these were acute mesenteric ischaemia. Our results suggested that surgical treatment is very limited and rarely successful once bowel necrosis has occurred due to mesenteric vascular occlusion. Mamode *et al* (20) had similar findings, with a mortality rate of 81%.

Acute appendicitis, rarely occurring in the elderly, had a higher perforation rate of 40% in our patients, which concurs with findings of previous series. Abdominal sepsis secondary to appendiceal perforation increases morbidity and the mortality (21-24). No fatal outcomes were observed due to perforated appendicitis in this study although in large series, mortality secondary to perforated appendicitis in the elderly has reached up to 12% (21,23).

Finally, acute gastrointestinal bleeding requiring surgical intervention has grave consequences in older people with concomitant diseases. Despite the relatively rare occurrence of surgically treated gastrointestinal hemorrhage, mortality is higher than in more common causes of surgical emergency. Ageing is associated with an increased rate of comorbidity; an ageing population makes the evaluation of gastrointestinal bleeding in older people a common clinical challenge (25). The prognosis of upper gastrointestinal haemorrhage was found to be poorer in elderly patients with associated serious comorbidity and the mortality rate reached 22.4%. Patients who are at highest risk of re-bleeding and death are the elderly and those in shock at presentation (27,27). Among bleeding causes, erosive gastritis was observed to be highly fatal in the elderly. The presence of severe underlying diseases as stress factors, diffuse, massive and uncontrollable haemorrhage and extensive surgery (gastric resection) to control ongoing hemorrhage lead to undesirable outcomes in older patients. As found in our three patients, cardiac surgery is an important factor in gastrointestinal bleeding due to surgical stress. Simic *et al* (19) has reported that 59 of 4288 patients with cardiac surgery had abdominal complications and that 39% of these complications presented with

acute hemorrhage.

Another point to consider is early re-laparotomy. Excluding the planned ones for mesenteric vascular occlusion, relaparotomies were performed for surgical treatment of postoperative complications in 5.5% of our patients. Miettinen et al (9) found a 4.5% incidence of re-operations for complications after emergency surgery in the elderly. In our series, anastomotic suture leakage and evisceration were complications leading to early re-laparotomy.

The most important consideration following emergency abdominal surgery is mortality. Firstly, a considerable number of older patients have pre-existing concomitant diseases, which increase operative risk. In large series of the elderly having abdominal emergency, more than half of patients had serious comorbidity prior to emergency operations (5,6,28) and this rate has reached 87.5% in nonagenarian (5) patients. Mortality is higher in the elderly who undergo emergency operations and the overall mortality has been reported as between 5.3% and 25% in different series (2-5,8,9,29). Detailed analysis of abdominal emergency with a higher risk of mortality showed that hemorrhage, secondary peritonitis and acute

mesenteric ischaemia are the leading causes of fatal outcome. The mortality rate of 37% in our patients with these three severe causes of abdominal emergency focused our attention on these pathologies. Emergency surgery was relatively safe for the remaining 124 patients with a mortality of 4.8%.

Conclusions: 1. The two common causes of surgical emergency in the elderly, acute calculous cholecystitis and strangulated external hernia are two potentially preventable emergencies by elective surgery. 2. Surgical treatment of acute mesenteric ischaemia is unsuccessful and a fatal outcome is likely once massive bowel necrosis has occurred. 3. It is hard for elderly patients to tolerate hypovolemic shock and abdominal sepsis and upper gastrointestinal hemorrhage and peritonitis secondary to hollow viscus perforations therefore have a worse prognosis in the older person. 4. Excluding some severe conditions, the overall success of surgical interventions for abdominal emergencies is satisfactory in the majority of older people. This study confirmed that active surgery is safe for a considerable number of older people with abdominal surgical emergency.

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