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A Common Surgical Emergency İn Elderly: Acute Mechanical Bowel Obstruction

Yaşlılarda Sık Görülen Cerrahi Acil Durum: Akut Mekanik Bağırsak Tıkanıklığı

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Abstract

Aim: Acute mechanical bowel obstruction (AMBO) is a common surgical emergency. İn geriatric patients, AMBO makes up about 12-15% of emergency cases and 50% of them require urgent operation. The aim of this study is to review the etiological factors, treatment options and the outcome of elderly who had been operated for AMBO.

Materials and methods: The files of patients, over the age of 65 and operated due to AMBO between January 2015 and De-cember 2019, have been retrospectively examined. The etiologic factors of AMBO have been re-viewed in terms of age, gender, localization of obstruction, previous surgeries, surgical procedure, histopathologic findings and survival.

Results: The mean age of 281 patients with AMBO was 73.4±13,69. 53.3% (n=150) of the patients were male, and 46.7% (n=131) were female. AMSBO cases formed 54.09%, and AMLBO 45.91%. The most common reason for AMBO in females was hernias with 14.9% , while that of males was tumors with 26.6%. Tumors were the most common reason in all AMBO cases with 39.5%. Tumor was the most common mortality reason with 44.4% , followed by hernias with 22.2%. Total mortality rate was 9.6% (n=27). In 66.6% (n=18) of the patients in which mortality was detected, the diagnosis was AMLBO.

Conclusion: The findings of this study supports the current data about etiological factors of AMBO in elderly with tumors and hernias being the most common; besides the other finding -considering bezoars - that re-flect different rates of an endemic area.

Keywords: Bowel obstruction, elderly, bezoar.

Öz

Amaç: Akut mekanik bağırsak tıkanıklığı (AMBT) yaygın bir cerrahi acil durumdur. Geriatrik hastalarda AMBO acil vakaların yaklaşık% 12-15'ini oluşturur ve% 50'si acil operasyon gerektirir. Bu çalışmanın amacı AMBO için ameliyat edilen yaşlıların etiyolojik faktörlerini, tedavi seçeneklerini ve sonuçlarını gözden geçirmektir.

Gereç ve yöntem: Ocak 2015 - Aralık 2019 tarihleri arasında AMBT nedeniyle ameliyat edilen 65 yaş üstü hastaların dosyaları geriye dönük olarak incelendi. AMBT'nin etyolojik faktörleri yaş, cinsiyet, tıkanıklığın loka-lizasyonu, önceki ameliyatlar, cerrahi prosedür, histopatolojik bulgular ve sağkalım açısından gözden geçirilmiştir.

Bulgular: AMBT olan 281 hastanın yaş ortalaması 73.4 ± 13,69 saptandı. Hastaların % 53.3'ü (n = 150) erkek,% 46.7'si (n = 131) kadındı. Akut mekanik ince barsak tıkanıklığı (AMİBT) vakaların % 54.09'nu ve akut mekanik kalın barsak tıkanıklığı (AMKBT) olguların % 45.91'u oluşturmaktaydı . Kadınlarda AMBO'nun en yaygın nedeni % 14.9 ile fıtık iken, erkeklerde% 26.6 ile tümöral neden-lerdi. Tüm AMBT olgularında % 39.5 ile tümörler en sık nedendi. Tümöral nedenler % 44.4 ile en sık mortalite nedeni olarak saptandı. Takiben % 22.2 ile herniler ikinci en sık mortalite nedeni olarak bulundu. Toplam ölüm oranı% 9.6 (n = 27) idi. Mortalite saptanan hastaların % 66.6'sında (n = 18) tanı AMİBT' idi.

Sonuç: Bu çalışmada, literatürle uyumlu olarak yaşlı hasta populasyonunda AMBT'nın en sık görülen neden-leri tümöral nedenler ve fıtıklar olarak saptanmıştır; ancak endemik bölgelerde sık görülen diğer nedenler de - bezoarlar gibi- yaşlı hastalarda AMBT açısından akılda tutulmalıdır.

Anahtar kelimeler: Barsak tıkanıklığı, yaşlı hasta, bezoar.

INTRODUCTION

Acute mechanical bowel obstruction (AMBO) is a condition where the passage interrupted and so congested due to various reasons[1]. AMBO is one of the most common surgical emergencies and generally requires urgent surgical intervention. Twenty percent of all urgent surgical interventions are recorded as AMBO[2]. AMBO may involve small or large intestine and complete or partial obstruction according to gas discharge.

İn geriatric patient group, AMBO makes up about 12-15% of emergency cases and 50% of them require urgent operation[3]. Urgent abdominal operations are associated increased morbidity and mortality due to comorbidities among geriatric patients. Risk factors regarding mortality in AMBO are age, etiology, intestinal necrosis and comorbidities[4]. İn last decade geriatric patient population has been increasing, there are few studies investigating the surgical treatment results among geriatric patients with AMBO[5]. The aim of this study is to review the etiological factors, treatment options and the outcome of patients over the age of 65 who had been operated for AMBO.

MATERIAL and METHODS

The files of patients, who were over the age of 65 and operated due to AMBO in Sakarya University Medical Faculty Department of General Surgery between January 2015 and December 2019, have been retrospectively examined. AMBO cases that were treated medically have been excluded. The data of the cases have been evaluated in terms of acute mechanical small bowel obstruction (AMSBO), acute mechanical large bowel obstruction (AMLBO), age, sex, surgical procedure (bridectomy, herniorrhaphy ± mesh, resection ± anastomosis ± ostomy, enterotomy, or milking) and mortality.

Tumoral obstructions have been evaluated in terms of localization, surgical procedure, histopathologic findings and perioperative mortality. Anatomical localization of tumors were listed as they were recorded on the files. Choice of surgical procedure (definitive or palliative treatment) and the need of ostomy have been evaluated. Histopathologic reports have been evaluated in terms of tumor type AMBO cases due to adhesion have been classified according to primary surgical operations, surgical procedure and survival. Mechanical obstructions due to bezoar reasons have been evaluated in location, type of surgery and mortality. Hernias have been examined in terms of type, localization, treatment approach, and survival. Incisional hernias have been classified as originated from gastrointestinal, gynecological or previous hernia surgery.

The statistical analysis was performed with SPSS for Windows, Version 16.0 (SPSS Inc., Chicago, IL, USA). The study has been completed with the approval of the Ethics Committee of Sakarya University Medical Faculty.

RESULTS

The mean age of 281 patients with AMBO was 73.4±13,69. 53.3% (n=150) of the patients were male (distribution: 65-94; average: 72,7±14,2), and 46.7% (n=131) were female (distribution: 65-93; average: 74,4±12,01). It has been observed that 54.09% (n=152) of patients were AMSBO (mean 69.5 ± 14.79), and 45.91% (n=129) were AMLBO (mean 74.6±14.3). The most common reason for AMBO among females was hernias with 14.9% (n=42), while that of males was tumoral reasons with 26.6% (n=75). Tumors were the most common reason for AMBO with 39.5% (n=111). Following rates were; hernias with 23.8% (n=67), bezoar with 13.5% (n=38) and adhesions with 12.8% (n=36) re-garding etiology. The most common etiological factor among AMSBO was hernias with 43.04% (n=65), other common factors were bezoars with 25.1% (n=38) and adhesions with 23.8% (n=36). Tumors were the most common etiology among AMLBO patients with 80% (n=104). Sigmoid volvulus was the second most common etiological factor with 13.8% (n=18) in this group (Table 1).

Mortality rate was detected as 9.6% (n=27). Tumors was the most common mortality reason with 44.4% (n=12), followed by hernias with 22.2% (n=6) and sigmoid volvulus with 14.8% (n=4). In 66.6% (n=18) of the patients in which mortality was detected, the diagnosis was AMLBO. Mortality rates were 44.4% and 22.2%, respectively in tumor and sigmoid volvulus associated AMLBO cases. The 55.5% of the mortality rate of AMSBO cases include inguinal hernia patients.

Tumors that cause AMBO have been evaluated in terms of localization, gender, type of surgery, pathology and mortality. Tumor localization was colon in 93.6% (n=104), and small intestine in 6.4% (n=7) of patients. The mean age of patients operated for tumor was 76.8±11.79; 67.5% (n=75) were male and 32.5% (n=36) were female. Obstruction was mostly detected in sigmoid colon with 36.9% (n=28), followed by rectum and descending colon with 21.1% (n=22) both. Obstruction in ileum was in 74.4% (n=5) of patients with tumor associated AMSBO, while jejunal obstruction was in 28.6% (n=2). In 96.1% (n=100) of patients operated for colonic obstruction, definitive surgical process was performed in the first operation. 4 patients with rectum localization were subjected to ostomy and directed to adjuvant chemoradiotherapy procedure. Adenocarcinoma was the most common diagnosis with 88.2%, followed by mucinous carcinoma with 8.1%, lymphoma and metastasis of ovarian carcinoma with 1.8% both. Mortality rate among tumoral AMBO patients was 10.8% (n=12) (Table 2).

Sixtyseven patients (23.8%) operated for hernia were summarized in Table 3. The mean age of the patients was 76.2±11.4, and 37.3% (n=25) of them were male, while 62.7% (n=42) were female. The most common hernia reasons were incisional and inguinal hernia with 43.2% and 35.4%, respectively. 56.6% of inguinal and femoral hernias were located on the right side. Previous gastrointestinal sur-gery was detected to be the most common surgical operation that caused incisional hernia with 55.1%. This is followed by hernia surgery with 31%, and surgeries for gynecological reasons with 13.7%. The mortality rate was 8.9% (n=6) and most of them were inguinal hernia 83.3% (n=5).

The etiology in 25.1% (n=38) of AMSBO cases was bezoar. 65.7% (n=25) of these patients were male and 44.3% (n=13) were female, while the mean age was 74.1±12.3. Bezoar localization was recorded as jejunum in 55.2% (n=21) and as ileum in 44.8% (n=17). Milking and enterotomy were the surgical procedure performed in 55.2% (n=21) and 44.8% (n=17) of patients, respectively. Mor-tality rate was 2.63% (n=1) (Table 4).

The mean age of 36 patients operated for adhesion was 74.3±12.04; 44.4% (n=16) were male and 55.6% (n=20) were female. The most common previous surgical operation was gastrointestinal surgery with 30.5% (n=11). This is followed by gynecological surgery with 27.7% (n=10), colorectal surgery with 22.2% (n=8), hepatobiliary surgery with 11.1% (n=4), and operations due to trauma with 8.3% (n=3). Adhesiolysis procedure was applied to 58.3% (n=21) of patients. Small bowel resection was performed in 38.8% (n=14) of patients. Anastomosis and ileostomy were performed in 84.8% (n=12) and 14.2% (n=2) of resection patients, respectively. Mortality rate was 2.7% (n=1) (Table 5).

The AMBO incidence of colonic volvulus was % 6.4 (n=18). The male/female proportion was 2:1 (12/6) and the mean age was 74.88±12.3. Resection with Hartmann colostomy, resection with anastomosis, and detorsion with sigmoidopexy were the surgical procedures in 61.1% (n=11), 27.7% (n=5), and 11.1% (n=2) of patients, respectively. The mortality rate was % 22.2 (n=4).

Other rare AMBO reasons formed the 3.91% of the cases (n=11). 2 patients (0.7%) were operated for Ogilvie's syndrome. Caecostomy was the surgery for one patient, and sigmoid loop colostomy was the procedure for the other patient. This patient, -sigmoid loop colostomy- died on the

Table 1: Distrubition of etiology for AMBO

	Age,years (Mean±SD)	Sex M/F	AMLBO	AMSBO	Mortality	Total	%
Tumor	76.8±11.79	75/36	104	7	12	111	39.5
Hernia	76.2±11.4	25/42	2	65	6	67	23.8
Bezoar	74.1±12.3	25/13	-	38	1	38	13.5
Adhesion	74.3±12.04	16/20	-	36	1	36	12.8
Volvulus	74.88±12.3	12/6	18	-	4	18	6.4
Inflammatory bowel disease	73.5±9.19	1/1	-	2	1	2	0.7
Diverticulitis	77	1/-	1	-	-	1	0.35
Acute colonic pseudo-obstruction (Oglivi's syndrom)	90±5.65	1/1	2	-	1	2	0.7
Caecum torsion	85	-/1	1	-	-	1	0.35
İntramural hematoma	77	-/1	-	1	1	1	0.35
Gallstone İleus	85±11.3	2/-	-	2	-	2	0.7
Foreing body	84	1/-	1	-	-	1	0.35
Intestinal fibrosis	73	_/1	-	1	-	1	0.35
Total	73.4±13,69	150/131	129	152	27	281	100

AMBO: Acute mechanical bowel obstruction, AMLBO: Acute mechanical large bowel obstruction, AMSBO: Acute mechanical small bowel obstruction; M: Male F: Female; SD: standard deviation.

Table 2 : Evaluation of AMBO duo to tumor		
Tumor reasons for AMBO n=111	**AMLBO n=104**	**AMBSO n=7**
Sex (M/F)	72/32	3/4
Tumor localisation		
Ceacum	12	-
Right colon	16	-
Transverse colon	6	-
Left colon	22	-
Sigmoid colon	28	-
Rectum	22	-
Jejunum	-	2
İleum	-	5
Surgical treatment		
Definitive	100	3
Paliative	4	4
Ostomy	51	1
Pathology		
Adeno cancer	94	4
Mucinous cancer	9	-
İnvasion of primary tumor	1	1
Lymphoma	-	2
Survival		
Yes	93	6
No	11	1
Total	104	7
AMBO: Acute mechanical bowel obstruction, AMLBO: Acute mechanical large bowel obstruction, AMSBO: Acute mechanical small bowel obstruction		

Table 3 : Evaluation of AMBO duo to hernia											
			Treatment			Survival		Primary Surgery			Total
Type of Hernia	Sex M/F	Resection	Ostomy	Mesh (+)	Mesh (-)	Yes	No	GIS	Gynoco-logical	Hernia	
İncisional	4/25	14	1	10	19	28	1	16	4	9	29
İnguinal R:13 L: 11	18/6	12	1	9	15	19	5	-	-	-	24
Umblical	2/4	1	-	1	5	6	-	-	-	-	6
Femoral R: 4 L: 2	1/5	1	-	2	4	6	-	-	-	-	6
İnternal											
Obturatuvar	-/1	-	-	-	1	1	-	-	-	-	1
Diapragmatic	-/1	-	-	-	1	1	-	-	-	-	1
Total	25/42	28	2	22	45	61	6	16	4	9	67
GIS: Gastrointestinal system, M: Male F: Female											

Table 4: Evaluation of AMBO duo to bezoars	
Bezoars (n=38)	
Age,years (Mean±SD)	74.1±12.3
Sex (M/F)	13/25
Localization of the obstruction	
Jejuneum	21
İleum	17
Surgical Treatment	
Enterotomy	17
Milking	21
Mortality	1
M: Male F: Female; SD: standard deviation.	

Table 5 : Evaluation of AMBO duo to adhesions							
		Surgical Treatment				Mortality	Total
Primary surgery	M/F	Adhesiolysis	Laparoscopy	Bowel resection	Ileostomy		
Colorectal	5/3	5	1	2	1	-	8
Upper GIS	7/4	6	-	5	1	-	11
Gynecologic	-/10	6	-	4	-	1	10
Hepatobiliary	3/1	2	-	2	-	-	4
Trauma	2/1	2	-	1	-	-	3
Total	16/20	21	1	14	2	1	36
GIS: Gastrointestinal system, M: Male F: Female							

postoperative second day. Gallstone ileus was the case in 2 male patients (0.7%). Enterotomy was performed in these patients. Two of the patients (0.7%) were operated due to stricture in terminal ileum who already has the diagnosis of Crohn's disease. Small bowel resection was performed for one of them, and right hemicolectomy was performed for the other patient; this patient died on the post operative 7th day. A patient with obstruction in sigmoid colon due to diverticulitis was operated, sigmoid colon resection with Hartmann colostomy procedure was the choice of surgery for this patient. Foreign body extraction was performed for a patient with an obstruction due to foreign body in the rectum. A case of caecum torsion was operated with right hemicolectomy and ileotransversostomy procedure. Jejunostomy due to intestinal fibrosis was the surgical procedure for a 73-year-old female patient receiving radio-therapy for ovarian carcinoma. Jejunum resection and jejunostomy was performed for a 77-year-old patient receiving anticoagulant treatment in whom obstruction was due to intramural hematoma. The patient died on the postoperative second day.

DISCUSSION

With the increase in life expectancy, the incidence of acute mechanical bowel obstruction also increases. There are a few studies that evaluate the etiological factors and the surgical treatment outcomes of AMBO in geriatric patient group[5-7]. One of the factors increasing the incidence of AMBO is the in-crease in tumor incidence in geriatric age group.

The average age at which AMBO was seen in the late 19th century was 35.5. This average age currently is 63.88. The average age in AMBO due to tumors was reported as 58±13, while average age in AMBO due to non-tumoral reasons was reported as 49±209. Only patients age 65 and over were included in our study; the average age of these patients is 73.4±13,69, where that of AMSBO is 69.5 ±14.79 and that of AMLBO is 74.6±12.3. It is observed that 28.8% (n=81) of patients and 75% (n=21) of patients who showed a fatal course were at the age of 80 and over.

There are studies in the literature reporting that the ratio of male patients was higher in AMBO[10], while some other studies report that the ratio of female patients was higher[9]. There is no gender different in our patient group. It has been observed that the small bowel obstruction were higher among female patient population in accordance with the literature[11]. It is reported that the obstruction level in 75% of AMBO cases including all age groups is small bowel[10.] The ratio of small bowel originated cases are half the all cases in our study. This difference can be explained with the high incidence of malignity in geriatric patient group, and with the fact that medically treated AMBO patients were not included in the study.

Etiological factors causing AMBO may depend on geographical locations. Sigmoid volvulus is the most common AMBO reason reported in Middle Africa[12], while strangulated external hernias the most common AMBO reason in Turkey. In our study, the most important etiology of AMBO in geriatric group are tumors, hernias, adhesions, and bezoars. It is expected to observe AMBO in elder patients due to tumoral reasons more frequently. However, different from the literature, AMBO cases due to bezoars are common in our region which is a natural region of growth for Persimmon, and thus, where phytobezoars are endemically observed.

Adhesions due to previous operations is the most common reason for all age groups in the literature[13]. In the study of ten Broek et al. that includes 19 studies, the incidence of small bowel obstruction after abdominal surgery was reported 9% and only 2% of them needed surgical intervention[14]. The incidence of adhesion also depends on the type of previous operation[15]. The types of abdominal surgery that mostly cause adhesion are gynecological surgery with 24%, colorectal surgery with 19%, and upper gastrointestinal surgery (GIS) with 15.6%[16]. The rate of adhesion in AMBO and AMSBO pa-tients in our study are 12.8%

and 23.8%, respectively. Different from the literature, the most common previous surgical operation is GIS surgery with a rate of 30.5%. The surgical mortality rate of AMSBO patients due to adhesions is 2.7%, similar with the reported rates, which were 3-5%[17,18].

Tumors are reported as the second most common reason for AMBO in all ages. In our study including geriatric patients, tumors are the most common etiology of AMBO. The most frequent cancer types that reported to cause AMBO are colorectal cancers with 10-28%[19] and ovarian cancer with 5-51%[20]. The most common reported extraperitoneal tumors leading to AMBO are breast and lung can-cer metastases. Small bowel primary tumors are observed at a rate of 1-2%, and 51% of them are di-agnosed with the obstruction[19]. Sigmoid colon is reported as the most frequent part in case of tumor associated large bowel obstruction[21]. The most common tumor localization in our study is also the sigmoid colon with 26.9%. The most common histologic type in colonic tumors is adenocarcinoma with 80%, which is similar with our rate 80.2%[22]. Mortality rate in colorectal cancers that cause AMBO has been reported as 14%[23]. The mortality rate in our study was 10.8%. İn our study, definitive surgery could be achieved in most of these tumor patients. Palliative surgery rate was only 7.3%.

Hernias are still the most common AMBO reasons in developing countries8. Hernia associated AMBO is reported 15-30%[9]. Hernias that cause AMBO are inguinal hernias in 75%, and the strangulation rate was reported 29% for inguinal and 60% for umblikal hernias[24]. In our study, hernia associated AMBO rate is in between the publish range 23.8%. The most common types of hernia are, incisional hernia and inguinal hernia.

Bezoar is a rare reason for 4.5% of AMBO. Nevertheless, the bowel obstruction is reported as 60% in patients with bezoar[25]. In our study, bezoars make up 25.1% of AMBSO cases and 13.5% of total AMBO cases. The mortality rate of bezoar-related-AMBO is reported 4% in the literature, which is similar with our mortality rate (2.63%)[25].

Sigmoid volvulus incidence as a reason of AMBO in developed countries is 5%, while that rate in developing countries is stated as 13%[26]. The incidence in elderly increase in developed countries. In our study, sigmoid volvulus associated AMBO rate was 6.8%, with a mean age of 74.8. The mortality rate of colonic volvulus has been reported as 9.44% in the literature, which is 22.2% in our study, higher than the rate mentioned in the literature[26].

It is reported that 35-54% of inflamatory bowel disease patients require surgical intervention with the diagnosis of AMSBO[27]. The mortality rates, caused by obstruction, in Crohn's disease and ulcerative colitis were reported 1.2% and 0.8%, respectively[27]. The mortality rate, caused by IBD, is detected as 0.3% in our study.

Gallstone ileus is a rare AMBO reason with 1-4% rate[28]. The obstruction is often at the level of terminal ileum . The mortality rate is stated as 5.5% in the literature[28]. In our study, the AMSBO rate due to gallstone ileus is 1.32%. No mortality is recorded.

The incidence rate and mortality rate of diverticular AMBO are 2.3% and 2.3%, respectively[29]. In our study, Hartmann procedure was applied to one patient with sigmoid colon diverticular AMLBO. No mortality was monitored.

Ogilvie syndrome that causes AMLBO is a pseudoobstruction developed secondary to the functional large bowel motility disorder. The treatment is medical in general. The mortality rate among surgical treated patients is 40%[30]. In our study, the AMLBO incidence related to Ogilvie was detected as 0.7%. Caecostomy was the surgical procedure in both of these patients. These patients made up the eldest cases (90-y-o).

AMBO is still one of the most common diagnosis for ad-

mission to hospital among geriatric patients, and make up 10% of all surgical intervention. Our study shows that tumoral reasons should be the first diferential diagnosis in geriatric patients in case of AMBO. Hernias are the other top reasons of AMBO in geriatric patients. Bezoars are the third most common reason in geriatric patients operated for AMBO in this study, which is different than the literature. As a conclusion, the findings of this study supports the current data about etiological factors of AMBO in geriatric patients, besides the other finding -considering bezoars - that reflect different rates of an endemic area.

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