SMALL BOWEL DISEASES REQUIRING EMERGENCY SURGICAL INTERVENTION

ACİL CERRAHİ GİRİŞİM GEREKTİREN İNCE BARSAK HASTALIKLARI

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ABSTRACT

In our study, it was aimed to determine the main indications requiring emergency surgical interventions in small intestines in daily practices of surgeons, and to analyze the data in parallel with the literature. 127 patients, who underwent emergency surgical intervention in our center due to small intestinal disease, were involved in this study. The data were obtained by retrospectively examining the files and computer records of the patients. Of the patients, demographical characteristics, diagnoses, performed emergency surgical interventions, and mortality parameters were recorded. The electively operated patients and those having no insulated small intestinal disease were excluded. The numeric variables are expressed as mean ±standard deviation.The mean age of patients was 50.3±19.2 years. The portion of females to males was 0.58. The most frequent emergency surgical intervention was the interventions that were performed due to small intestinal obstruction in 61 (48%) patients. The most frequent reason for small intestinal obstruction was found to be the lesions. Following the small intestinal obstruction, other most frequent reasons were small intestinal perforation in 28 (22%) patients, mesentery ischemia in 18 (14%) patients, malign neoplasia in 9 (7%) patients, chron disease in 8 (6%) patients, and benign neoplasms in 3 (2%) patients. The most frequently performed operations were adhesiolysis (bridectomy), small intestine resection and anastomose, and enterostomy, respectively. The total number of mortality was found to be 7 (5%). The cause of mortality was observed to be mesentery ischemia in 5 patients, followed by small intestinal perforation in 2 patients. The most frequently performed emergency surgical intervention is the operation performed due to small intestinal obstruction. The most frequent cause of obstructions was the postoperative adhesions. The most frequent cause of the small intestinal perforations was the perforations due to blunt and penetrant traumas. Lymphoma was found to be the most frequently seen small intestinal tumor. The acute mesentery ischemia was found to be the small intestinal disease with highest mortality rate. The most frequently performed operation was small intestinal resection and anastomosis.

Keywords: Emergencies, Intestine, Small, Surgery, Intestinal Obstruction, Neoplasms

ÖZET

Çalışmamızda cerrahların günlük pratiklerinde, ince barsakta acil cerrahi girişim gerektiren ana endikasyonları belirlemek, literatür desteğinde verileri analiz etmek amaçlanmıştır. Merkezimizde ince barsak hastalığı nedeniyle acil cerrahi girişim uygulanan 127 hasta çalışmaya alınmıştır. Hastaların dosya ve bilgisayar kayıtları retrospektif olarak incelenerek veriler elde edilmiştir. Hastaların demografik özellikleri, tanıları, yapılan cerrahi girişimler ve mortalite parametreleri kayıt altına alındı. Elektif opere edilen hastalar ve izole incebarsak hastalığı olmayan hastalar çalışma dışı bırakıldı Rakamsal değişkenler ise ortalama±standart sapma olarak verildi.

Hastaların ortalama yaşları 50.3±19.2 idi. Kadın erkek oranı 0.58 idi. En sık acil cerrahı girişim 61 (%48) hasta ile ince barsak obstruksiyonu nedeniyle yapıldı. En sık ince barsak obstruksiyonu nedeni olarak adezyonlar bulundu. İnce barsak obstruksiyonlarından sonra en sık acil girişim gerektiren nedenler sırasıyla 28 (%22) hasta ile ince barsak perforasyonları, 18 (%14) hasta mezenter iskemi, 9 (%7) hasta malign neoplaziler ve 8 (%6) hastada chron hastalığına, 3 (%2) hastada benign neoplazmlara bağlıydı. Hastalara en sık yapılan operasyonlar adezyolizis (bridektomi), ince barsak rezeksiyonu ve anastamoz, enterostomi idi. Toplam mortalite sayısı 7 (%5) olarak bulundu. Beş hastada mortalite nedeni mezenter iskemiye bağlı görüldü. Bunu 2 hasta ile ince barsak perforasyonu izledi.

En sık acil cerrahi girişim ince barsak obstrüksiyonları nedeniyle olmaktadır. Obstrüksiyonların en sık sebebi ise postoperative adezyonlardı. İnce barsak perforasyonlarının en sık sebebi künt ve penetran travmalara bağlı perforasyonlardı. Lenfomalar en sık görülen malign ince barsak tümörü olarak bulundu. Akut mezenter iskemi en fazla mortalitenin görüldüğü ince barsak hastalığı olarak bulundu. En sık yapılan cerrahi girişim ince barsak rezeksiyon ve anastamozu idi.

Anahtar Kelimeler: Acil, İnce barsak, Cerrahi, İntestinal Obstrüksiyon,Neoplazi,

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INTRODUCTION AND OBJECTIVE

Nowadays, the surgical interventions to small intestines still constitute a problem. The most important reason for this is that the small intestines are affected from a wide range of diseases. Moreover, small intestine is a complex organ having many important tasks such as digestion, absorbing, secretion, and endocrine function. For this reason, the small intestinal diseases may lead to life-threatening clinic conditions. Some of the small intestinal diseases are treated medically, while some others may require surgical treatment. Emergency surgical interventions are performed due to mechanical obstruction, perforation, ischemia, inflammatory intestinal disease, and tumors.

The small intestinal obstruction is the most frequent cause of emergency surgical intervention. The rate of emergency surgical intervention is 16%.[1] The most frequent cause of small intestinal obstruction is the postoperative adhesions.[2] Among other causes, the hernias, invagination, tumors, parasites, and volvulus can be given as examples.[3, 4] Small intestinal perforation is another cause of emergency surgical intervention. Delayed diagnosis and treatment lead to the increase in mortality. The most frequent causes for the perforations are the ischemia, foreign bodies, tumors, blunt and penetrant trauma, iatrogenic injuries, and diverticulitis.[5-9]

Small intestinal tumors constitute 1% of all the gastrointestinal tumors. Despite that they are observed very rarely, they may lead to life-threatening conditions such as obstruction, perforation, and hemorrhage. Lymphomas, neuro-endocrinal tumors, sarcomas, and adenocarcinomas are the tumors that are seen in small intestines and may lead to the highest rate of emergency surgical intervention.[10] Furthermore, leiomyomas and metastatic tumors may also lead to emergency surgical intervention to the small intestines.[11-13]

Chron disease is another important disease requiring emergency intervention in small intestines. Even though its main therapy is medical, the causes such as hemorrhage, perforation, and structure may also require emergency surgical interventions.[14, 15]

Acute mesenteric ischemia is a rare clinic condition constituting 1 of every 1000 applications to the hospital. The most frequent reason for it is the obstruction of superior mesenteric artery or its branches due thromboembolism. Immediate diagnosis and treatment decrease the mortality and morbidity rates. The main treatment is performed via interventional radiology, while the emergency surgical intervention is required in cases such as acute abdomen, perforation or necrosis.[16] Other rare causes of emergency surgical interventions are Meckel's diverticulitis and jejunoileal diverticulosis.[17, 18]

In our study, it was aimed to determine the main indications requiring emergency surgical intervention to small intestines in daily routines of surgeons, and to analyze the data with the support of literature. In parallel with this objective, our clinic experiences are shared.

MATERIAL AND METHOD

127 patients, who underwent emergency surgical intervention in our center due to small intestinal disease between 2015 and 2016, were involved in this study. The data were obtained by retrospectively examining the files and computer records of the patients. Of the patients, demographical characteristics, diagnoses, performed emergency surgical interventions, and mortality parameters were recorded. The electively operated patients and those having no insulated small intestinal disease were excluded. The duodenal diseases were not involved. The patients were operated by 4 general surgeons working at our center. The numbers of cases are presented without any statistical comparison between the groups. The numeric variables are expressed as mean±standard deviation. Ethical approval was not required because of the retrospective study.

RESULTS AND DISCUSSION

Mean age of the patients was 50.3±19.2 years. The portion of females to males was 0.58. The characteristics of patients are presented in Table 1.

Table 1. Characteristics of the patients

Characteristics of the	patients
Female/Male	0.58
Mean Age	50.3±19.2
Duration of hospital stay (day)	12.1±9.4
Mean operation time (hour)	2.3±1.2
Total mortality n (%)	7 (5.5)

Result were given mean ±standard deviation

While 120 of the patients were taken into emergency operation by hospitalizing in emergency service or polyclinic, 7 patients were taken into operation due to small intestinal pathology developing after the primary intervention. Of these, 2 were due to iatrogenic injury and 5 were due to post-operative early-phase ileus. The most frequent diagnosis tool was computerized abdominal tomography. 15 of the patients were diagnosed with physical examinations and conventional graphs. The most frequently performed emergency surgical intervention was performed due to the small intestinal obstruction. The most frequent reason for the small intestinal obstruction was found to be the adhesions. Following the small intestinal obstructions, other most frequent causes of emergency surgical intervention are small intestinal perforations, mesentery ischemia, neoplasia, and chron disease. The most frequently performed operations were adhesiolysis (bridectomy), small intestine resection and anastomose, and enterostomy, respectively. The total number of mortality was found to be 7 (5%). The cause of mortality was observed to be mesentery ischemia in 5 patients, followed by small intestinal perforation in 2 patients. Small bowel pathologies requiring emergency surgical intervention are presented in Table 2.

Table 2. Small bowel pathologies requiring emergency surgical intervention

Pathology	n	%
Small Bowel Obstruction		
Postoperative Adhesion	38	30
Strangulated hernia	14	11
Intussusception	3	3.1
Volvulus	4	2.3
Foreign bodies	1	0.78
Tumor	1	0.78
Small Bowel Perforation		
Ileus secondary to perforation	5	3.9
Blunt Trauma	5	3.9
Foreign bodies	4	3.1
Penetrating trauma	4	3.1
Weapons Injury	4	3.1
Ischemia	3	2.3
Iatrogenic injury	2	1.6
Tumor	1	0.78
Small Bowel Tumor		
Malignant		
Lymphoma	3	2.3
Adenocarcinoma	2	1.6
Metastatic	2	1.6
Neuroendocrine	1	0.78
Leiomyosarcoma	1	0.78
Benign		
Adenoma	2	1.6
Leiyomyoma	1	0.78
Mesenteric ischemia	18	14.1
Crohn's Disease	8	6.2
Total	**127**	**100**

The reasons for the surgical interventions to small intestines cover a wide range of diseases. It is very important to protect this vital organ during the surgical interventions. In cases, where the small intestines cannot be protected, the small intestinal syndromes may appear. For this reason, the sensitive balance between the treatment of primary diseases and the protection of small intestines should be ensured.

The leading one of diseases requiring emergency surgical intervention is the mechanical obstruction of small intestines. A delay in diagnosis and treatment may lead to ischemia, necrosis, and perforation. The main cause of the mechanical obstruction of small intestines in adults is the adhesions and inguinal hernia.[19] In developed countries, 67-75% of the small intestinal obstructions are constituted by the adhesions.[20, 21] In our study, among the small intestinal diseases requiring emergency surgical intervention, the small intestinal obstruction took first place with 61 (48%) patients. The most frequent cause of small intestinal obstruction was found to be the adhesions in 38 (62%) patients. Our findings were in harmony with the literature.

In 14 of the patients, the cause of small intestinal obstruction was found to be the incarcerated hernia in frontal abdominal wall. The most frequent strangulation was observed in inguinal hernias. In 2 of these patients, the incarceration belonged to femoral hernia. Others were caused from incisional hernia, umbilical hernia, and internal herniation, respectively. Also the rare cases resulting in small intestinal obstruction such as paraduodenal and lumbar hernia have also been reported.[22, 23] But, in our study, no lumbar or paraduodenal hernia was observed in any of the patients.

In 7 of the patients underwent emergency surgical intervention due to small intestinal obstruction, the cause was related with small intestinal invagination and volvulus. Small intestinal volvulus was observed in 4 patients. In a study, it has been reported that small intestinal volvulus represents less than 5% of all the intestinal obstructions and 25% of all the small intestinal obstructions.[24, 25] In a study examining the adult intussuscepts, it has been determined that 5% of all the intussusceptions were observed among adult individuals and these 5% of the intestinal intussusceptions were causes of the intestinal obstruction.[26, 27] The findings of our study were in harmony with literature data.

Among the patients having no strangulation, perforation and complete obstruction in adhesion-caused mechanical obstruction of small intestines, who couldn't be healed via 48h conservative follow-up and medical treatment, the emergency surgical intervention is necessary in cases of increases in clinic symptoms.[28] In our study, the mean conservative follow-up duration in adhesion-related small intestinal obstructions was

found to be 28 ± 2.1 hours. As the surgical intervention, the recommended surgical methods are adhesiolysis and resection to inviable segments.[29] While the most frequently used method in our study was adhesiolysis, the small intestinal resection and anastomosis was applied to 6 patients, jujunostomia to 1 patient, and ileostomy to 2 patients.

The small intestinal perforations may develop due to various reasons. In our study, the small intestinal perforations developing secondary to blunt and penetrant trauma and the small intestinal perforations developing secondary to ileus were found to be the most frequent causes. The delayed diagnosis and treatment in small intestinal perforations decrease the mortality rate. The blunt-trauma-related small intestinal perforations are observed rarely.[30] In our study, in contrast with the literature, it was found to be one of the most frequently observed perforation causes. The small intestinal perforations related to the swallow of foreign body is very rare at the rate of <1%.[8] In our study, there were 4 perforation cases caused from foreign body swallow. The small intestinal perforations rarely develop due to the tumors.[31] In our study, the perforation was observed in 1 patient with small intestinal adenocarcinoma. The iatrogenic small intestinal injuries are among the reasons for small intestinal perforations. In a study, the rate of intestinal injury after the laparoscopic cholecystectomy has been found to be 0.07–0.7%.[32] In our study, the iatrogenic injury of small intestines developed only in 2 patients, one with laparoscopic cholecystectomy and one with laparoscopic ventral hernia restoration. The primary restoration and the drainage were performed in small intestinal perforations most frequently. The small intestinal resection and anastomosis were performed for 9 of the patients, while jujunostomy was performed for 1 patient and ileostomy for 4 patients.

Malign small intestinal tumors are observed very rarely. Many various histological types of malign tumors can be seen in small intestines. But the adenocarcinoma, leiomyosarcoma, neuro-endocrine tumors, lymphoma and sarcoma constitute the majority of cases.[10] In our study, the small intestinal lymphoma was found to be the most frequent malign tumor type with 3 patients. It is followed by the small intestinal adenocarcinoma with 2 patients. Since the small intestinal tumors have no specific symptom or clinic condition, the delays in diagnosis may occur. The diagnosis can be made through the symptoms such as obstruction, perforation and hemorrhage.[10, 33] In our study, the small intestinal tumors were observed in 1 patient due to small intestinal obstruction and 1 patient due to small intestinal perforation. But, leiomyomasarcoma is a very rarely-seen malign tumor.[11] It was observed in only one of the patients in our study. The metastatic tumors may appear due to small intestinal perforation or obstruction.[13] In our study, the tumoral masses metastatic small intestines were found only in 2 patients. In one of the cases, the metastasis was due to lung cancer, and it was due to the epithelial malign tumor with unknown primary focus in other case. The incidence of neuroendocrine tumors in small intestines is approximately 0.7%.[12] In our study, jujunal neuroendocrine tumor was observed in 1 patient. Plasmablastic lymphoma and gastrointestinal stromal tumors can also be seen in small intestines.[34] One patient having recurrent hemorrhage attacks was operated due to leiomyoma and 2 patients with partial small intestinal obstruction were operated due to adenoma.

Acute mesentery ischemia is a rarely seen clinic condition observed in 1 of every 1000 applications to hospital.[29] Arterial embolism is the main cause of acute mesentery ischemia. Angiography plays important role in both of diagnosis and treatment.[35] But, in advanced ischemia cases, the intestinal necrosis and perforation may develop. In such cases accompanied by the acute abdomen symptoms, the surgical treatment is preferred.[36] In our study, emergency surgical intervention was performed due to acute

mesenteric ischemia for 18 patients. 5 of these patients had small intestinal necrosis. Mortality was observed in postoperative period in these 5 patients. While 8 patients having segmentary small intestinal necrosis were treated with resection and anastomosis, ileostomy or jujunostomy was applied together with resection for 5 patients.

Chron disease is the most important cause requiring emergency surgical intervention in small intestines.[15] Hemorrhage, perforation, and intestinal obstruction are the most important emergency surgical intervention cause related with chron disease. The incidence of perforations due to chron disease varies between 1 and 3%.[29] While resection anastomosis can be preferred for suitable patients, the diversion can be preferred for non-suitable patients. In our study, the resection anastomosis was applied to one of 2 patients with perforation, while ileostomy was applied together with resection in other patient. Small intestinal obstructions affect 35-54% of chron patients.[14] Resection or structuroplasty is the preferred treatment. Of 6 patients with obstruction symptoms but not responding to medical treatment, resection and anastomosis were applied to 4 patients, and structuroplasty was applied to 2 patients. The small intestinal diseases requiring emergency surgical intervention cover a wide range of diseases. Since many diseases have no specific symptom or clinic finding, the delays may occur in diagnoses. The delays in diagnoses and treatments may increase the mortality and morbidity. Among the patients applying with non-specific symptoms such as stomachache, vomiting and abdominal distention, the small intestinal diseases should be kept in mind.

CONCLUSION AND SUGGESTIONS

The most frequent cause of emergency surgical interventions is due to small intestinal obstructions. The most frequent cause of the obstructions is the postoperative adhesions. The most frequent cause was the perforations due to blunt and penetrant trauma. Lymphomas were found to be the most frequently seen small intestinal tumors. The acute mesentery ischemia was found to be the small intestinal disease with highest rate of mortality. The most frequently performed surgical intervention was the small intestinal resection and anastomosis.

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