Research Article / Araştırma Makalesi

Emergency General Surgery Experience Of A Tertiary Center

Üçüncü Basamak Merkeze Ait Acil Genel Cerrahi Deneyimi

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Abstract

Background: We aimed to present the emergency General Surgery patient profile and results of our hospital.
Materials and Methods: This retrospective study was conducted in Diyarbakır Gazi Yaşargil Training and Research Hospital Clinic between 1 January 2016 and 31 December 2019. Patients who were admitted to the emergency department and underwent emergency operations at the General Surgery clinic were included in the study. Gender, age, anamnesis, laboratory tests, radiological findings, preoperative diagnoses, surgery notes, and postoperative results of the patients were recorded.
Results: A total number of 2820 cases including 1201 (42.6%) female, and 1619 (57.4%) male patients were enrolled in the study. The mean age of the patients was 37.32 years (min: 14, max: 94). The most common age range was between the ages of 21-30 years.
Most of the emergency surgeries were performed due to nontraumatic indications in 2645 (93.8%) , and 1790 of them (67.67%) were cases of appendicitis. Other indications of nontraumatic emergency surgeries were abscess, incarcerated hernia, ileus, and perforation. 175 (6.2%) patients who came to our general surgery emergency department were operated on due to trauma. The most common causes of trauma in these patients were sharp force and stab injuries in 43.4% and gunshot wounds in 39.4% of the cases.
Conclusions: The frequency and distribution of emergency cases vary according to the locations of the hospitals. Epidemiological studies and increasing data on emergency surgery enable the determination of the emergency surgery profile of the regions and the preparation of the hospital staff for the patients who will seek medical help.

Key Words: Acute abdomen, Traumatic acute abdomen, Nontraumatic acute abdomen

ÖZ.

Amaç: Hastanemizin acil Genel Cerrahi hasta profilini ve sonuçlarını sunmayı amaçladık.
Materyal ve Metod: Bu retrospektif çalışma 1 Ocak 2016 – 31 Aralık 2019 tarihleri arasında Diyarbakır Gazi Yaşargil Eğitim ve Araştırma Hastanesi Genel Cerrahi kliniğinde gerçekleştirildi. Acil servise başvuran ve Genel Cerrahi kliniğince acil operasyona alınan hastalar çalışmaya dahil edildi. Hastaların cinsiyet, yaş, anamnez, laboratuar tetkikleri, radyolojik bulguları, preoperatif tanıları, ameliyat notları ve postopertatif sonuçları kaydedildi.
Bulgular: Bu çalışmaya alınan toplam hasta sayısı 2820 idi. Bunların 1201'i (%42,6) kadın, 1619'u (%57,4) erkek idi. Hastaların ortalama yaşı 37,32 yıl (min:14, max:94) idi. En sık karşılaşılan yaş aralığı 21-30 yaş aralığı idi. Acil operasyonların çoğunu 2645 (%93,8) hasta ile nontravmatik nedenler oluşturuyordu. Bunların 1790' ı (%67,67) appendisit idi. Diğer nontravmatik acil operasyon nedenleri; apse, inkarsere herni, ileus ve perforasyon idi. Genel cerrahi acilimize gelen 175 (%6,2) hasta travma nedeniyle opere edildi. Hastalarda travmanın en yaygın nedenleri %43,4 ile kesici ve delici alet yaralanması (KDAY) ve %39,4 ile ateşli silah yaralanmaları (ASY) idi.
Sonuç Hastanelerin bulunduğu bölgeye göre acil olguların sıklık ve dağılımı değişmektedir. Acil cerrahi ile ilgili epidemiyolojik çalışmalar ve verilerin artması bölgelerin acil cerrahi profilinin belirlenmesine ve hastane çalışanlarının gelebilecek hastalara hazırlıklı olmasına imkân sağlar.

Anahtar kelimeler: Akut karın, Travmatik akut karınlar, Nontravmatik akut karınlar

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Introduction

Patients who apply to the emergency department due to sudden onset of abdominal pain are usually consulted to the department of general surgery with the indication of non-traumatic abdominal pain (1). Only 15-16% of the cases consulted to general surgery are caused by trauma (2). Nontraumatic acute abdomen is defined as the pain unrelated to traumatic incidents that suddenly affects intra-abdominal organs and can be serious enough to be life-threatening (3). The most common cause of nontraumatic acute abdominal pain is nonspecific abdominal pain, followed by acute appendicitis (4). Traumatic acute abdomen is due to blunt or penetrating abdominal trauma. If traffic accidents are considered as blunt trauma, blunt abdominal traumas are observed more frequently than penetrating traumas (5). The basis of emergency surgical intervention is to make a quick decision and to perform the appropriate intervention in a timely manner. Although it is possible to diagnose diseases that cause acute abdomen in many cases, based on the patient's anamnesis, physical examination, site of injury, and laboratory findings, still radiological imaging methods have great diagnostic importance in choosing appropriate surgical or medical treatment methods. When radiological methods are combined with clinics in cases of acute abdominal pain, the rate of correct diagnosis increases significantly (6). However, emergency interventions often coincide with the hours of duty when all units of the hospital provide the lowest level of service, and auxiliary methods can be used in a limited way in diagnosis and treatment. In our study, we focused on what can be done to increase the quality of the service to be applied to these patients.

Materials and Methods

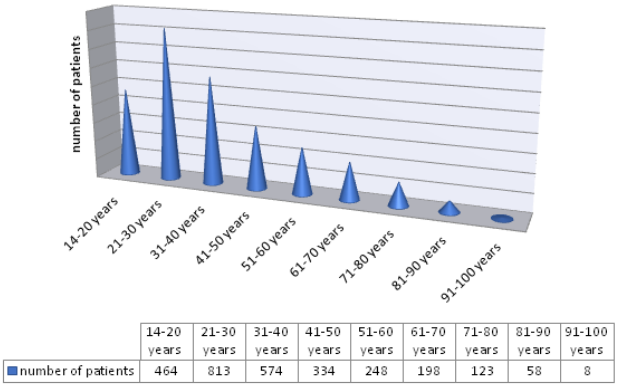
In this retrospective descriptive study, patients who underwent emergency surgery in General Surgery Clinics of Diyarbakır Gazi YaşargilTraining and Research Hospital Hospital between 1 January 2016 and 31 December 2019 were retrospectively analyzed. The article passed the ethics committee with the number 'Diyarbakır Gazi Yaşargil Training and Research Hospital ethic committie: 03.09.2021/575'. Demographic characteristics, surgical diagnoses, incidence, morbidity and mortality rates of them were evaluated.

Statistical analysis

Descriptive statistics of the continuous variables were presented as mean (± SD), while categorical variables as numbers, and percentages. Chi-square test was performed to determine the relationship between categorical variables. The level of statistical significance was set at p= 5% and SPSS (ver: 13) statistical program was used for all statistical analyses.

Results

A total number of 2820 cases including 1201 (42.6%) female, and 1619 (57.4%) male patients were enrolled in the study. The mean age of the patients was 37.32 years (min:14-max:94), and the most common age range was 21-30 years (Figure 1).



	14-20 years	21-30 years	31-40 years	41-50 years	51-60 years	61-70 years	71-80 years	81-90 years	91-100 years
number of patients	464	813	574	334	248	198	123	58	8

Figure 1. Distribution of the number of patients by age grups.

The number of patients increased in the spring and reached its highest level in the summer. Our 2645 (93.8%) patients were operated for nontraumatic, and 175 (6.2%) of them for traumatic indications.

The most common nontraumatic indication for emergency surgeries was appendicitis with a rate of 67.67 percent (Figure 2). In our study, a total of 1790 cases including 992 (55.4%) male, 798 (44.6%) female patients, and six pregnant women were operated for appendicitis. Ectopic pregnancy was detected in two patients.

Most (n:1334;74.5%) of the patients were in the age range of 15-39, and 19.2% (345) of them in 40-60 years of age, while 6.3% (n:111) of them were older than 60 years.

Respective number of patients were operated in the year 2016 (n: 467;26.2%), 2017 (n:489; 27.3%), 2018 (n:471; 26.3%) , and 2019 (n:363; 20.2%).

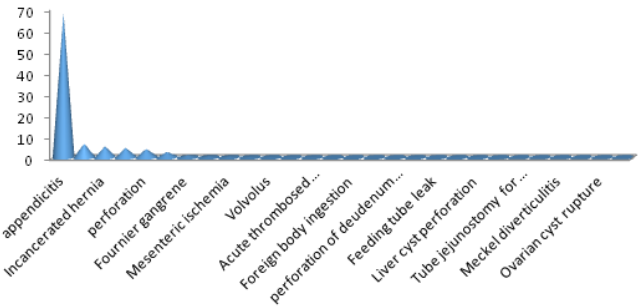


Figure 2. Etiologies of non-traumatic operation in the general surgery.

Perianal abscess was the most common surgical indication in 84 (3.17%) of 171 (6.46%) patients operated for abscess. 31 (1.17%) patients underwent emergency operation due to Fournier's gangrene.

Inguinal hernia was the most common surgical indication in patients who underwent emergency surgery for incarceration (n:137; 5.17%), followed by incarcerated umbilical

hernia (n:33; 1.25%).
118 (4.5%) patients were operated for ileus. Ten (0.37%) patients were reoperated for anastomotic leakage.
Peptic ulcer perforation was the most common surgical indication in patients who underwent emergency surgery for perforation caused by nontraumatic causes (n:106; 4%). One patient had bladder perforation in addition to peptic ulcer perforation. One patient who was operated for gastric perforation died due to active pulmonary tuberculosis.
Surgery was performed in our general surgery emergency department, mostly because of acute cholecystitis, which is one of the diseases related to the gallbladder and common bile ducts. Emergency laparoscopic cholecystectomy was performed in 68 (2.57%) patients due to acute cholecystitis. After ERCP, tube choledochostomy was performed in one patient due to injury of the common bile ducts. Conventional cholecystectomy was performed in four patients due to acute biliary pancreatitis.
Seven patients underwent emergency operation due to gastrointestinal system (GIS) bleeding. One patient died due to bleeding following cholecystectomy. Five patients were taken to emergency operation for acute thrombosed hemorrhoids and five patients for liver cyst perforation.
175 (6.2%) cases including 155 (88.6%) male, and 20 (11.4%) female patients with an M/F ratio of 7.5 who came to our general surgery emergency clinics were operated due to trauma. The mean ages of male, and female patients were 29.94 ± 12.3, and 32.2 ± 16.1, years respectively. The most common causes of trauma in patients were stab (43.4%) and then gunshot injuries (39.4%) (Figure 3).

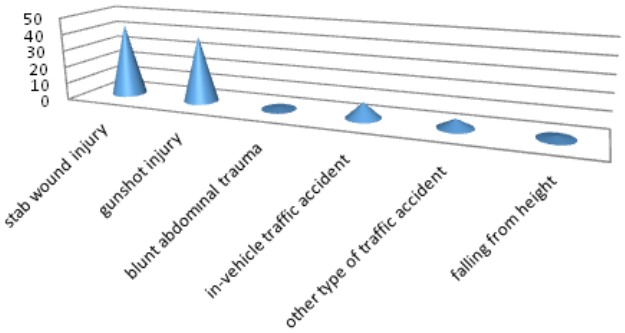


Figure 3. Distrubition of traumatic emergency operation etiologies.

The age group most affected by trauma in this study was 15-30 years old (57.4%), followed by 30-45 years old (25.8%). Most commonly right upper quadrant of the abdomen was exposed to trauma (Figure 4).
Computed tomographic (CT) scan of the abdomen was performed in 107 patients. Pathological images secondary to trauma were observed in 85 (79.4%) cases. Emergency ultrasonography (USG) was performed in 29 patients. Thirteen (44.8%) USGs demonstrated various pathologies. Hypotensive patients and those in shock (total n:22) were operated directly without performing imaging studies.
In our study, the most frequently injured hollow organ was the small intestine (26.8%), while the liver (24.0%) was the most frequently injured solid organ (Table1).

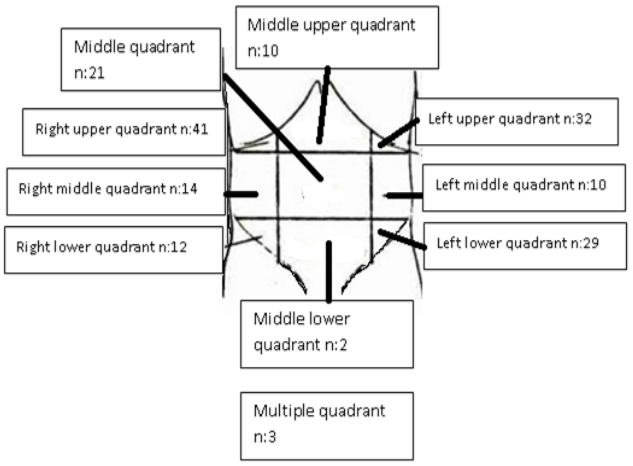


Figure 4. Number of entrance wounds in the abdominal quadrant that were caused by gunshot and stabbing.

Among 175 patients who underwent laparotomy, only 126 of them actually required surgery, while 27 patients with organ damage did not require treatment (nontherapeutic laparotomy), and in 22 trauma patients laparotomy did not reveal any pathology (negative laparotomy) (Table 1). According to these results, a total of 49 (28%) patients underwent unnecessary, nontherapeutic and negative laparotomies. When the interventions performed in 27 patients who underwent nontherapeutic laparotomies were examined; although there was an incision in the liver in 12 patients, no further intervention was made.
Hemostasis was performed in 12 patients, and bleeding from the omentum stopped. Repair of small intestinal serosa was performed in three, and gastric and colonic serosa repair in one patient. Defect in the mesentery was repaired in three patients who had injuries in the non-bleeding small intestine or colonic mesentery. Retroperitional bleeding was controlled in two patients.
The most common surgical interventions in our study were repair of traumatic small bowel perforation (26.8%) followed by primary repair of the liver (24.0%). 69 patients (39.4%) were hospitalized and operated due to gunshot wounds. Gunshot injuries had critically significant consequences. Usually, the patients injured in the Syrian war were transferred to our hospital, and intra-abdominal injury resulting from gunshot wounds required more than one surgical procedure (Table 2).
Renal injury was present in 15 patients. Nephrectomy was performed in six of them. Primary repair of the renal injury was performed in the remaining nine patients. Bladder injury was present in five (2.8%) patients who underwent primary repair (Table 2).
Postoperative wound infection developed in 24 (13.7%) patients. Four of them (2.2%) were reoperated for postoperative ileus. Abscess drainage was performed by interventional radiology because of the development of intra-abdominal abscess in one (0.5%) patient. Pneumothorax developing after chest injury (8.5%) was the most common extra-

abdominal injury detected in our study (Table 1).
Our four patients died. Our mortality rate was 2.2%. The patients who had gunshot wounds died due to aortic injury (n:2), major liver injury (n:1), and one patient exited due to portal vein injury after a traffic accident.

Table 1. Distribution of the surgical indications.

Trauma-induced surgeries		Operations performed for non-traumatic etiologies	
Surgical indications	**n / %**	**Surgical indications**	**n / %**
Stab wound injury	76/43.4%	Appendicitis	1790/67.67%
Gunshot injury	69/39.4%	Abscess	171/6.46%
Blunt abdominal trauma	2/1.1%	Incarcerated hernia	137/5.17%
In-vehicle traffic accident	16/9.1%	Ileus	121/4.57%
Other types of traffic accidents	9/5.1%	Perforation	110/4.16%
Falling from a height	3/1.7%	Diseases of gallbladder, and common biliary tracts	68/2.57%
		Fournier gangrene	31/1.17%
		Bleeding	18/0.68%
		Mesenteric ischemia	15/0.56%
		Volvolus	7/0.26%
		Acute trombosed hemorrhoids	5/0.19%
		Tube jejunostomy for gastric tumor	1/0.037%
		Relaparotomies	24/0.9%
		Invagination	4/0.15%
		Ruptured liver hydatid cyst	5/0.19%
		Meckel diverticulitis	1/0.037%
		Rupture of an ovarian cyst	2/0.075%
		Omental torsion	2/0.075%
		Negative laparotomy	133/5.02%
TOTAL	175/100%	TOTAL	2645/100%

Tablo 2. Affected organs and operations performed with the indications of stab and gunshot injuries

Organ	Surgery	Patients (n)	%)
Stomach		19	10,8
	Primary Repair	16	
	Resection/ Anastomosis	3	
Small Intestine		47	26.8
	Primary Repair	18	
	Resection/Anastomosis	29	
Colon		37	21.1
	Primary Repair	8	
	Resection/ Anastomosis	29	
Liver		42	24.0
	Primary Repair	23	
	Segmental Resection	1	
Spleen		20	11.4
	Splenectomy	13	
	Primary Repair	2	
Pancreas		4	2.2
	Primary Repair	2	
	Pancreatectomy	2	
Diaphragm	Primary Repair	16	9.1
Vessel	Vascular Repair	11	6.2
Kidney		15	8.5
	Primary Repair	9	
	Nephrectomy	6	
Chest	Pneumothorax	15	8.5
Bone	Bone Fracture	14	8.0
Bladder	Primary Repair	5	2.8
Ureter	Ureter stenting	1	0.5
Testis	Testicular Injury	1	0.5

Discussion

Emergency cases usually constitute the group of patients who have surgery at night and on weekends outside of working hours. Abdominal pain constitutes 5-10% of the reasons for applying to emergency outpatient clinics (7). General surgeons are involved in the follow-up and treatment of emergency patients, and play a key role in the process extending from the diagnosis and treatment of the disease to delivering the patient to the operating room and intensive care unit. In addition to situations that require emergency surgery, patients may also have injuries that can be intervened at any time. In these cases, general surgeons should be able to determine the balance between impementation of diagnostic tests and early surgical intervention, while prioritizing or postponing the operation to be performed when the patient is stable.
The main aim in acute abdominal pain due to traumatic or nontraumatic causes is to make the correct diagnosis and establish the appropriate treatment within a short time. Thus, it is possible to reduce morbidity, mortality, hospital stay and medical expenses. In the evaluation of patients with a prediagnosis of acute abdomen, some laboratory tests, radiological imaging and laparoscopic evaluation methods are being used in case of need (5). Mostly male patients had acute abdomen and in consistent with literature findings, they were in the age range of 21-30 years (1).
The causes of acute abdominal pain are both medical and surgical (8). Tarik et al. reported acute appendicitis, acute pancreatitis and duodenal ulcer as the most common causes of acute abdomen in Pakistan (9). In a study conducted in Ghana, acute appendicitis was reported as the leading clinical condition requiring emergency surgery, followed by typhoid fever with ileal perforation (10). In another retrospective study conducted on 450 patients who presented to the emergency department with acute abdominal pain at the University of Rome Surgery Institute, appendicitis was the most common indication for surgery (11). In our study, most common indications for surgery were appendicitis (67.67%) followed by incarcerated hernia and GIS perforation.
Acute appendicitis is the most common surgical emergency (12). In this study, appendectomies were performed in 68% of the patients who underwent emergency surgeries. Appendicitis is most common between the ages of 10-30 (19). In our study, the mean age of the patients with appendicitis was 32.56 ±9.7 years. While appendicitis is seen equally in boys and girls in childhood, its incidence increases in boys in adulthood. It has been reported that the male-female ratio is 3:2 in this period (13). In our study male, and female cases consisted of 55.4% , and 44.6% of the study population, respectively.
Trauma continues to be a major public health problem worldwide. It can affect all age groups and is associated with high morbidity and mortality rates in every country. In the studies conducted by Mukhopadhyay M et al. (16,17), the most frequently affected age group was in the age range of 31-40 years. In our study, mostly people in the age bracket

of 15-30 years (57.4%), followed by 30-45 year- old (25.8%) individuals were affected. Similar observations have been reported in various studies (14-17). This age range is an economically productive age group, and the trauma exposed by these patients causes economic loss to both their families and the nation.

In this study, male/female ratio in traumatic abdominal injuries was 7.5/1. This result was consistent with other reported studies (18-21). The male dominance seen in this study is mostly due to the fact that men are income-generating members of the family and are mostly exposed to outdoor activities, while women mostly stay at home. In addition, men are more involved in the acts of violence in our region.

The liver was the most common solid organ injured in cases with blunt abdominal trauma (5.8%), followed by spleen (5%). These results are consistent with the studies of S. Gopalswamy (25), Ayman-El-Menyar et al. performed in 2014 (26), but contradict with the results of various national and international studies (14,19,20,22,23). In our study, the most frequently injured hollow organ in penetrating abdominal trauma was the small intestine. These findings are consistent with the results of various national and international studies (20,24).

In the study conducted by Ahmet Kocakuşak et al. in Van, the rates of nontherapeutic , and negative laparotomies were 29% and 28%, respectively (27). Our rates of nontherapeutic, and negative laparotomies were 11.2% and 9.2%, respectively. We think that the reason why our results are relatively lower is related to the increase in the number of advanced imaging techniques we are using.

Our mortality rate was 2.2% similar to that reported by Idriss, A.M et al. (28), but lower than those indicated in many studies (29,30). In this study, the majority of the patients were young people aged 15-30 years with low comorbidity (57.4%). Elderly patients (>60 years) with high comorbidity account for only 7.2% of the cases. Multiple organ injuries had occurred due to the destructive feature of the intra-abdominal shrapnel fragments. Hemorrhagic shock as a result of major vascular injury was responsible for all fatal injuries.

Conclusion

The frequency and distribution of emergency cases vary according to the region where the hospitals are located. Epidemiological studies and the increase in data on emergency surgical operations allow the determination of the emergency surgical profile of the regions and the preparation of general surgeons for possible surgical cases. Identifying emergency cases also plays an important role in the organization of emergency departments and operating rooms of the hospitals.

Study limitations

The most important factors limiting our study are the retrospective nature of our study.

Ethical Approval: Diyarbakır Gazi Yaşargil training and research Hospital ethic committiee: 03.09.2021/575

Author Contributions:
Concept: İ.T, E.Y
Literature Review: İ.T, E.Y
Design : İ.T, E.Y
Data acquisition: İ.T, E.Y
Analysis and interpretation: İ.T, E.Y
Writing manuscript: İ.T, E.Y
Critical revision of manuscript: İ.T, E.Y
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