ORIGINAL ARTICLE

Methamphetamine-related peptic ulcer perforation: a growing medical concern

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ABSTRACT

BACKGROUND: Many studies have been done in the literature on perforations due to substance abuse, and there are limited publications on perforations related to inhaled methamphetamine. Recently, in our clinic, we observed an increase in the number of patients with perforated peptic ulcer, which we think is secondary to a significant increase in the consumption of this drug. The main purpose of this study is to determine whether the use of inhaled methamphetamine known as "fire and ice" is a factor directly related to peptic perforation and its complications and also to determine the demographic variables of patients with peptic ulcer perforation due to this substance use, in the context of the literature.

METHODS: A retrospective study was conducted by examining the medical records of 29 gastric perforation patients who underwent surgical treatment in our clinic in 2021. Data were transferred to SPSS.23 (IBM Inc., Chicago, IL, USA) program and evaluated with statistical analysis. Normality assumptions of continuous variables were examined with Kolmogorov–Smirnov test, and variance homogeneity was examined with Levene's test. Bi-level comparisons, t-test if the data are normally distributed and Mann–Whitney U-test for bi-level comparisons where the data are not normally distributed were used. Relationships between categorical variables were examined by Chi-square test analysis. P<0.05 was accepted as the level of significance in all analyzes.

RESULTS: Twenty-nine patients were divided into two groups as methamphetamine users (n=13) and non-users (n=16). There was a statistically significant difference according to the lower age in the group using methamphetamine (31.69−48.8-P=0.025). The presence of PU history differed significantly between the groups (P=0.009). Interestingly, aspartate transaminase alanine aminotransferase values were lower in substance dependents (P=0.020). Furthermore, there was a significant difference in localization between groups (P<0.001). There was no statistically significant difference between the two groups in terms of gender, clinical presentation, and other laboratory values.

CONCLUSION: Methamphetamine consumption, known as fire and ice, is an important risk factor for ulcer development and subsequent perforation, especially in young patients and long-term consumption of this narcotic substance. It has been determined that this risk factor, which is currently considered rare, has been seen in a very large number in a short time in our clinic. The use of this substance, which is considered a major social threat, is becoming more and more widespread, and this study is only a small part of the iceberg reflected in the general surgery clinic of a hospital.

Keywords: Acute abdomen; methamphetamine; peptic ulcer; perforation.

INTRODUCTION

Peptic ulcer perforation is not exclusive to modern times, as its occurrence has been mitigated by the use of common preventive drugs such as proton pump inhibitors (PPIs). At present, there are reports in the literature demonstrating a reduction in the incidence of peptic ulcer disease (PUD) in first-world countries. Nevertheless, the occurrence of the disease and subsequent perforations persist.[1] PUD remains the primary cause of stomach perforation. It is estimated

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that the incidence of PUD is approximately 1.5–3%, with a lifetime prevalence of perforation estimated at around 5%. Mortality rates associated with PUD vary, ranging from 1.3% to 25%.[2] The development of peptic ulcers is believed to result from an imbalance between protective factors, such as gastric motility, mucus secretion, and neuronal secretion of protective-inducing factors, and aggressive factors such as excessive secretion, heavy smoking, alcoholism, and prolonged acid exposure to the mucosa. However, a systemic cause or the mechanism of a local ulcer perforation has not yet been determined.[1]

While the use of PPIs and H2 antagonists decreases the incidence of perforated ulcers, it is important to note that the effects of tobacco, alcohol, non-steroidal anti-inflammatory (NSAIDs), and corticosteroid drugs are the cause of ulcer perforation. The two primary factors contributing to its etiology are NSAIDS and Helicobacter pylori.[2] Additional contributing factors include smoking, chronic liver disease and chronic kidney failure, and hyperparathyroidism, especially during dialysis and transplantation.[2] Apart from the previously mentioned factors, new factors have arisen due to social, economic, and demographic changes. Notably, the use of illicit substances, particularly cocaine, heroin, and chronic use of inhaler methamphetamine, is considered a risk factor.[1,3]

Methamphetamine possesses a chemical structure similar to amphetamine, but it has more pronounced effects on the central nervous system level. Methamphetamine impacts the central nervous system by increasing the release of monoamine neurotransmitters, including serotonin, dopamine, and norepinephrine.[3] Individuals who use methamphetamine experience an acute, strong, and short attack of lasting roughly 5–30 min, with variations depending on the method of use. This substance also causes an increased energy level, suppresses appetite, and induces euphoria that can last for 6–12 h.[4]

Methamphetamine is among the most potent central nervous stimulants. "Crystal meth," the most widely abused illegal drug worldwide, is a highly purified form of D-methamphetamine that occurs in crystalline structure. The final phase of methamphetamine misuse manifests as paranoia and irritability due to severe insomnia, which may persist for a duration of 3–15 days. Typically, individuals at this stage escalate their methamphetamine intake in a bid to recapture the initial euphoric effect. However, since achieving this effect becomes increasingly challenging, it often leads to frustration, irritability, and indecisive behavior. Importantly, individuals at this stage of methamphetamine use become unpredictable, potentially engaging in violent acts, instigating family disputes, committing impulsive crimes, and posing risks to themselves and others. Consequently, caution should be exercised by individuals in proximity to such users due to their unpredictable behavior. Methamphetamine use has been associated with an increased pain threshold, leading patients to disregard symptoms. Abdominal complications resulting from methamphetamine use are infrequent and can be easily overlooked by clinicians.[4-10]

Recently, we have seen an increase in the number of patients with perforated peptic ulcer, which we think is secondary to a significant increase in the consumption of this substance, in our clinic. The main purpose of this study is to determine whether the use of inhaled methamphetamine known as "fire and ice" is a factor directly related to peptic perforation and its complications, and also to determine the demographic variables of patients with peptic ulcer perforation due to this substance use, by the guidance of the literature.

MATERIALS AND METHODS

Data Source and Patient Selection

We retrospectively collected information regarding the age, causes, and surgical-clinical management of patients who underwent surgery for perforated peptic ulcers at our hospital's general surgery clinic over the past year (January 1, 2021–December 31, 2021). Data were obtained through the hospital information system and patient interviews. Patients with incomplete clinical records or those who did not have a complete clinical record and declined to provide necessary data in blank format were excluded from the study. In addition, patients who stated that they used substances other than fire and ice (cannabis, heroin, cocaine, bonsai, etc.) as anamnesis were also excluded from the study. The evaluated patients were divided into two groups: Group A: Consisted of patients using methamphetamine, and Group B: Included patients who did not using methamphetamine.

Statistical Analysis

Data were transferred to SPSS.23 (IBM Inc., Chicago, IL, USA) program and evaluated with statistical analysis. Before proceeding to the statistical analysis, controls were made regarding the absence of data entry errors and whether the parameters were within the expected range. Normality assumptions of continuous variables were examined with Kolmogorov–Smirnov test, and variance homogeneity was examined with Levene's test. Mean and standard deviation values were given for continuous variables, and frequency (n) and percentage (%) values were given for categorical variables. Bi-level comparisons, t-test if the data are normally distributed, and Mann–Whitney U-test for bi-level comparisons where the data are not normally distributed were used. Relationships between categorical variables were examined by Chi-square test analysis. $P<0.05$ was accepted as the level of significance in all analyzes.

Our study received ethical approval from the Ethics Committee of Gaziantep Islamic Sciences and Technology University Clinical Research.

RESULTS

In the past year, a total of 29 patients underwent surgery with a diagnosis of gastric perforation. Among them, 13 (44.8%) cases were attributed to the use of "fire and ice" (inhalant methamphetamine), while 16 (55.2%) cases were caused by

Table 1. Association of groups with peptic ulcer history

		Group 1 n (%)	Group 2	P-value
PU	-	10 (76.9)	4 (25.0)	0.009*
	+	3 (23.1)	12 (75.0)	

*: P<0.05

Table 2. Etiology

	n (%)
Alcohol	1 (3.44)
Smoker cigarette	21 (68.9)
Fire and ıce	13 (44.8)
COVID +	1 (3.44)
KOAH	5 (17.24)
NSAIDs	7 (24.13)
SVO	1 (3.44)

NSAIDs: Non-steroidal anti-inflammatory.

reasons unrelated to substance use. 10 out of the 13 (76.9%) individuals using fire and ice had no prior history of peptic ulcer or stomach symptoms, while 3 (23.1%) did have peptic ulcer. While no stomach complaints/symptoms were reported in these patients, three cases were classified as peptic ulcer patients because they had previously undergone surgery for the same reason. Conversely, among those people who did not use fever ice material, 4 (25.0%) had not peptic ulcer, while 12 (75.0%) had peptic ulcer. A statistically significant difference was found between peptic ulcer and fever and ice substance use (P=0.009). The effect size of this difference was calculated as 0.517 (Table 1).

Except for peptic ulcer and gastritis histories, 13 (36.11%) of all patients were found to have a history of fire and ice material use. One patient (2.78%) had an alcohol addiction and 20 (68.9%) of them were smokers. Notably, eight of 20 smokers were belonged to the non-substance-using group (50%). Among the 13 substance-using patients, 12 were smokers, and only one patient reported not smoking (92.3%). NSAID use was present in 7 (24.13%) of all patients (all of whom were in the group not using METH). Furthermore, 5 (17.24%) had chronic obstructive pulmonary disease and 1 (3.44%) had a diagnosis of cerebrovascular disease. One (3.44%) patient underwent surgery under the diagnosis of COVID-19. In one of the patients who did not use METH, no etiology was found except a history of peptic ulcer (Table 2).

The mean age of individuals using fire and ice was 31.69±10.82, while the mean age of those who did not use this substance was 48.81±20.81. A statistically significant correlation between substance use and age was observed (P=0.025). It was determined that the average age of those who used fire ice substance was younger (Table 3).

No statistically significant differences were found in the mean day of symptom onset, mean length of hospital stay, mean white blood cell, hemoglobulin, neutrophil, C-reactive protein, and aspartate aminotransferase values between two groups (P=0.948, P=0.531, P=0.471, P=0.410, P=0.449, P=0.914, P=0.249) (Table 3). Interestingly, the mean ALT (alanine aminotransferase) value was 12.08±3,55 for patients used fire and ice, compared to 20.06±11.77 for those not using this substance. There was a statistically significant effect of fire and ice use on the ALT values (P=0.020), with higher ALT values observed in those who did not use "fire and ice". (Table 3). No statistically significant differences were found between the two groups in terms of the evaluation of

Table 3. Comparison of age, symptom, hospitalization day, and laboratory values of patients according to fever and ice substance use

	Units	Group 1 Ort.±SS	Group 2	P-value
Age	Year	31.69±10.82	48.81±20.81	0.025*
Symptom day	Day	3.46±3.53	2.69±1.30	0.948
Hospitalization	Day	6.69±2.25	6.50±1.46	0.531
WBC		15.37±5.76	13.69±6.68	0.471
HGB		14.54±2.24	13.57±3.25	0.410
NEU		81.72±7.21	78.51±19.46	0.449
CRP		77.85±107.03	79.10±117.65	0.914
AST		23.23±10.67	30.50±17.66	0.249
ALT		12.08±3.55	20.06±11.77	0.020*

*: p<0.05, WBC: White blood cell; HGB: Hemoglobuline; NEU: Neutrophil; CRP: C-reactive protein; AST: Aspartate aminotransferase; ALT: Alanine aminotransferase.

Table 4. Fire and ice substance use by gender groups

	Group 1 n (%)	Group 2	P-value
Gender			
Male	13 (100.0)	12 (75.0)	0.107
Female	0 (0.0)	4 (25.0)	

the clinical picture, especially at the time of admission, acute abdomen data at the time of admission, and the presence of free air in the radiological examination.

All patients using fire and ice were male (100.0%), and there was no female patient using this substance. The number of male patients who did not use fire and ice was 12 (75.0%), and the number of female patients was 4 (25.0%). There was no statistically significant effect of substance use on gender groups (P=0.107) (Table 4).

In patients using "fire and ice," peptic ulcers were found in various sections of the gastrointestinal tract, with 2 cases (15.4%) in the first section of the duodenum, 1 case (7.7%) in the second section of the duodenum, 3 cases (23.1%) in the pyloric recurrence area, and 7 cases (53.8%) in the pre-pyloric region. Conversely, among those who did not use "fire and ice, 14 cases (87.5%) had peptic ulcers in the first section of the duodenum and 2 cases (12.5%) had them in the pre-pyloric region. In this group, ulcers were not found in the secons section of the duodenum. A statistically significant correlation was identified between location ulcers and the use of fire and ice (P<0.001) with an effect size of 0.734. In addition, peptic ulcers occurred in the pre-pyloric region in those who used "fire and ice," while they predominantly occurred in the first section of the duodenum in those who did not use this substance (Table 5).

When evaluating additional substance addictions, it was identified that some of the 13 patients in Group A had a history of multiple substance use. However, during the period of this study, they solely used "fire and ice" due to its accessibility and affordability. Cases of perforation attributed to the use of additional substances were excluded from the study, as the study exclusively focused on assessing the impact of "fire and ice" use.

Regarding surgical procedures, the majority of cases underwent graham omentoplasty or primary repair + combined with omentoplasty. Roux-en-Y gastroenterostomy was only performed in the case of duodenal second section perforation in the first group, which due to pyloric stenosis.

Biopsy was taken intraoperatively in six cases from the first group, revealing active inflamed fibrotic tissue as the pathology result. In contrast, intraoperative biopsy was not conducted in any case in Group 2. Five of these cases (out of 16) in Group 2 attended the follow-up endoscopy appointment postoperatively. Strikingly, none of the patients in the first group availed themselves of control endoscopy (out of the 13 cases). In terms of complications, five wound infections were observed in the first group, compared to one wound infection in the second group.

Regarding mortality, no deaths occurred in Group A, and while 2 patients (12.5%) (6.89% compared to the total case) died in Group B. One of these patients died due to post-operative respiratory problems after being operated under the diagnosis of COVID 19, and the other patient died due to sepsis and post-operative multiorgan failure syndrome in the initial presentation.

DISCUSSION

Methamphetamine, commonly known as crystal, "fire and ice" or meth among the public, is a colorless and odorless substance with a potent strong addictive effect. Despite its chemical similarities to amphetamines, methamphetamine has stronger effects on the central nervous system. It can be consumed through various methods, including snorting, oral ingestion, and intravenous administration. Short/long-term use of methamphetamine causes circulatory, respiratory, and neurological problems, as well as many mental health problems such as anxiety, aggression, and depression.

The precise prevalence of methamphetamine users in Türkiye remains unknown. However, available data suggest that methamphetamine abuse is linked to factors such as age, low edu-

Table 5. Comparison of the perforation localization of the groups

	Group 1 n (%)	Group 2	P-value
Localization			
Duodenum 1st continent	2 (15.4)	14 (87.5)	<0.001*
Duodenum 2nd continent	1 (7.7)	0 (0.0)	
Pylorus-relapse	3 (23.1)	0 (0.0)	
Pre-pyloric	7 (53.8)	2 (12.5)	

*: P<0.05

cation level, and use of other psychoactive substances. When the published researches and the reports are examined, it has been seen that approximately 185 million people in the world use illegal substances, and 33.4 million of these people are amphetamine users.[11] In this study our clinic, not only treats cases of gastric perforation but also attends to numerous patients injured by a substance user in a family dispute or any fight were followed up with surgical treatment.

Based on the findings in this study group, we show that methamphetamine consumption, known as "fire and ice", is an important risk factor for the development of a perforation event in an earlier age group than in non-users. Although our findings were similar to other reports on the effects of substance use on peptic ulcer and related perforation, we had a lower mean age in terms of age.[1,12]

There was no history of peptic ulcer or stomach symptoms in 10 individuals (76.9%) who used fire and ice, while 3 (23.1%) individuals had PU+. Although these patients did not report any stomach complaints/symptoms, pu(+) was confirmed because they had previously undergone surgery for the same reason. In contrast, among patients who did not use fire and ice 4 (25.0%) patients were PU- while 12 (75.0%) were PU+. A statistically significant difference was found between PU and fire-ice substance use. (P=0.009). In other words, there was a history of PU in 15 cases in total (51.7%). PUD is the leading cause of gastric perforation. With the advancement of medical management, the incidence of gastric perforation has decreased to <10% of peptic ulcer disease. It is most commonly seen in elderly patients who use NSAIDs and in patients who extensively consume alcohol.[13]

The effect of methamphetamine on gastric perforation is controversial, and there are very few studies on this extremely rare condition.[1,5] Thirteen (44.8%) of 29 cases in our study were related to substance use. In addition, we subjectively state that our cases used the substance in higher doses than other societies. Pathophysiologically, the common point is ischemia. It has been suggested that the effects of methamphetamine on the gastric mucosa may induce focal ischemia and inhibit gastric motility.[1,14] Other associated pathophysiological mechanisms may be increased air intake with increase in intragastric and intra-abdominal pressure caused by inhalation of the substance, platelet aggregation and vascular thrombosis, vasoconstriction, and vasospasm.[1,15]

In our study, gastric perforation developed in one patient who was followed up with COVID-19 pneumonia, and clinical mortality was observed due to post-operative pneumonia and lung failure. The occurrence of COVID-19 with gastrointestinal perforation is rarely reported. Hence far, only 16 gastrointestinal perforations associated with COVID-19 have been reported in the literature.[16]

However, it has not been possible to clearly determine whether these events individually or collectively pre-dispose to peptic ulcer perforation. Despite our findings, and based on this study design, we cannot fully confirm that this is a causal factor. These conclusions were reached on the basis of history alone and excluding any other possible etiologies.

While peptic ulcer perforation occurred in the pre-pyloric region in 7 (53.8%) of those who used fire ice, 14 (87.5%) of those who did not use fire ice material were seen in the first section of the duodenum. A statistically significant correlation was found between localization and the use of fire and ice (P<0.001). The effect size of this relationship was calculated as 0.734. Typically, peptic ulcers were usually observed in the pre-pyloric region in those who used fire-ice substance, while they predominantly occurred in the first section of the duodenum in those who did not use this substance (Table 4).

When reviewing the existing literature, it is evident that peptic ulcer perforation associated with methamphetamine use is concentrated in the post-pyloric region.[1] In this regard, our study differs from the findings in the literature. However, in a study of gastric perforation due to heroin-cocaine use, it was observed that perforation was intense in the pre-pyloric area.[12]

When we evaluated additional substance addictions, we found that some of the 13 patients had a history of using multiple substances but had only used "fire and ice" during this particular period due to its accessibility and affordability. Cases of perforation resulting from the use of additional substances were excluded from the study since we specifically focused on the effects of "fire and ice."

In terms of the surgical procedures performed, it was observed that graham omentoplasty or primary repair+omentoplasty was generally employed. Roux-en-Y gastroenterostomy was only performed in the case with duodenal second section perforation in the first group, attributed to pyloric stenosis.

While intraoperative biopsies were taken in six of the cases in the first group, the pathology results indicated active inflamed fibrotic tissue. In contrast, intraoperative biopsies were not performed in any case in Group 2. However, it was noted that five of these cases (out of a total of 16 cases) attended their post-operative follow-up appointments for control endoscopy. Interestingly, none of the patients in the first group sought control endoscopy (out of 13 cases). This may be attributed to the fact that these patients were generally experiencing depression, agitation, and maladaptive behaviors.

In complications, five wound infections were seen in the first group, while one wound infection was observed in the second group. No statistically significant difference was found. It is known that smoking is one of the factors related to the patient in the development of wound infection.[17] It is thought that wound infection is more common in substance use with a similar pathophysiology.

In terms of mortality, no mortality was observed in Group A, and 2 patients (12.5%) (6.89% compared to the total case)

died in Group B. One of these patients died due to post-operative respiratory problems after being operated under the diagnosis of COVID-19, and the other patient died due to first-admission sepsis and post-operative multiorgan failure syndrome. Statistically, there was no significant difference in morbidity and mortality in both groups.

The clinical presentation, radiological findings, length of hospital stay, procedure, and drainage used were similar to those reported in the literature.

CONCLUSION

Long-term consumption of methamphetamine, known as fire and ice, is a significant risk factor for the development of ulcer and subsequent perforation, especially among young patients. It has been observed that this risk factor, which is currently considered rare, has been increasingly prevalent in a short period in our clinic.

According to unofficial data, it is estimated that six out of 10 young people in our province can easily access and use this substance. The age of use has decreased to 10–11 years. We follow-up with surgical treatment in our clinic not only gastric perforation but also many patients who are injured by a sharp object, firearm, or beating due to substance abuse, by a relative living in the same house or by a stranger. The use of this substance, which is considered a major social threat, is becoming more and more widespread, and this study represents is only a small part of the iceberg reflected in the general surgery clinic of a hospital.

Ethics Committee Approval: This study was approved by the Gaziantep Islam Science and Technology University Ethics Committee (Date: 07.06.2022, Decision No: 132.17.21).

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ORİJİNAL ÇALIŞMA - *ÖZ*

Metamfetaminle ilişkili peptik ülser perforasyonu: Büyüyen endişe

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AMAÇ: Madde bağımlılığına bağlı perforasyonlar ile ilgili literatüre birçok çalışma yapılmış olup, inhaler metamfetaminle ilgili perforasyonlar hakkında sınırlı sayıda yayın mevcuttur. Son zamanlarda, kliniğimizde bu ilacın tüketiminde belirgin bir artışa sekonder olduğunu düşündüğümüz, özellikle perfore peptik ülseri olan hastaların sayısında artış olduğunu gördük. Bu çalışmanın temel amacı, "ateş&buz" olarak bilinen inhale metamfetamin kullanımının peptik perforasyonu ve komplikasyonları, özellikle perforasyon ile doğrudan ilişkili bir faktör olup olmadığını belirlemek ve ayrıca bu madde kullanımına bağlı peptik ülser perforasyonu olan hastaların demografik değişkenlerini literatür eşliğinde belirlemektir.

GEREÇ VE YÖNTEM: 2021 yılında kliniğimizde cerrahi tedavi uygulanan 29 mide perforasyonu hastalarının tıbbi kayıtları incelenerek retrospektif bir çalışma yapıldı. Veriler, SPSS.23 (IBM Inc., Chicago, IL, ABD) programına aktarılarak istatistiksel analizlerle değerlendirildi. Sürekli değişkenlerin normallik varsayımları Kolmogorov-Smirnov testi, varyans homojenlikleri ise Levene testi ile incelendi. İki düzeyli karşılaştırmalar, veriler normal dağılıyor ise T testi, verilerin normal dağılmadığı iki düzeyli karşılaştırmalar için Mann-Whitney U-testi kullanıldı. Kategorik değişkenler arasındaki ilişkiler ki-kare test analizi ile incelendi. Bütün analizlerde anlamlılık düzeyi olarak $p<0.05$ değeri kabul edildi.

BULGULAR: Yirmi dokuz hasta, metamfetamin kullananlar (n=13) ve kullanmayanlar (n=16) olmak üzere iki gruba ayrıldı. Metamfetamin kullanan grupta daha düşük olan yaşa göre istatistiksel olarak anlamlı bir fark vardı (31.69 - 48.8- p=0.025). Gruplar arasında PU öyküsü varlığı anlamlı derecede farklılık göstermekteydi (p=0.009). İlginç bir şekilde, madde bağımlarlında AST-ALT değerleri daha düşüktü (p=0.020). Ayrıca, gruplar arasında lokalizasyonda önemli farklılık mevcuttu (p<0.001). Cinsiyet, klinik durum, diğer laboratuvar değerleri, açısından iki grup arasında istatistiksel olarak anlamlı fark yoktu. Madde kullanmayan grupta nadir olarak 1 hasta Kovid tedavisi altında iken mide perforasyonu ile ameliyata alındı.

SONUÇ: Ateş&buz olarak bilinen metamfetamin tüketimi, özellikle genç hastalarda ve bu narkotik maddenin uzun süreli tüketiminde ülser gelişimi ve ardından perforasyon olayı için önemli bir risk faktörüdür. Halihazırda nadir olarak kabul edilen bu risk faktörünün kliniğimizde az sürede oldukça fazla sayıda görüldüğü tespit edilmiştir. Resmi olmayan verilere göre, ilimizde her 10 gençten 6'sının bu maddeye kolayca ulaşabildiği ve kullandığı tahmin edilmektedir. Kullanım yaşı 10-11 yaşına kadar düşmüştür. Sadece mide perforasyonu olarak değil, madde kullanımına bağlı, aynı evde yaşayan yakını veya bir yabancı tarafından kesici delici alet, ateşli silah veya darp ile yaralanan birçok hastayı da kliniğimizde cerrahi tedavi ile takip etmekteyiz. Toplumsal büyük bir tehdit olarak kabul edilen bu maddenin kullanımı gittikçe yaygınlaşmakta, bu çalışma ise sadece bir hastanenin genel cerrahi kliniğine yansıyan buzdağının görünen kısmının oldukça küçük bir parçasıdır.

Anahtar sözcükler: Akut batın; metamfetamin; peptik ülser; perforasyon.

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