

Pancreatic Lesions in Forensic Autopsy

ADLİ OTOPSİLERDEKİ PANKREAS LEZYONLARI

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Abstract

Objective: Pancreas is an organ leading to death by pancreatitis and pancreatic tumors. Various pancreatic lesions caused by different etiological factors are shown in autopsies. Pancreas diseases and injuries can lead to sudden death. Because of the rapid autolysis of this organ differential diagnosis of pancreatic pathologies might be very difficult in postmortem process. The aim of our study is to demonstrate pancreas lesions, etiological factors and differential diagnosis of pancreatic pathologies in forensic autopsy.

Material and Methods: Autopsy reports between the years 1999 and 2004 of the Morgue Department of the Council of Forensic Medicine were reviewed retrospectively and 15 cases with pancreatic lesions were evaluated according to cause of death, sex, and age using crime scene investigation reports, as well as histopathological and toxicological reports.

Results: 13 cases (86%) were male, 2 cases were female. Mean age was 47 (5-68), 6 cases (46%) were between 51-60 years. 11 cases (73%) of acute (hemorrhagic) pancreatitis, 3 cases (20%) of chronic pancreatitis, 1 case (6%) of primary pancreatic carcinoma were detected.

Conclusion: Alcohol is the most important etiological factor of pancreatic lesions in forensic autopsy. Trauma, poisoning and hypothermia were found as other etiological factors.

Key Words: Pathology, autopsy, pancreatic diseases, etiology

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Özet

Amaç: Pankreas, pankreatit ve pankreatik tümörleri ile ani ölüme yol açabilen bir organdır. Otopside, değişik etiyolojik nedenlerle oluşmuş çeşitli pankreas lezyonları ile karşılaşmaktadır. Pankreas hastalıkları ve travmatik yaralanmaları ile ani ölüm görülebilmektedir. Postmortem süreçte hızla otolize olmasından dolayı pankreas patolojilerinin ayırıcı tanısı da zor olmaktadır. Çalışmanın amacı; adli otopsilerde görülen pankreas lezyonlarını, ayırıcı tanısı ve etiyolojik faktörlerini göstermektir.

Gereç ve Yöntemler: Adli Tıp Kurumu Morg İhtisas Dairesi'nde 1999-2004 yılları arasında yapılan otopsilerin raporları yeniden gözden geçirildi ve pankreas lezyonu olan 15 olgu çalışmaya alındı. Ölüm nedeni, cinsiyet, yaş, olay yeri inceleme, histopatoloji ve toksikoloji raporları değerlendirildi.

Bulgular: Olguların 13'ü (%86) erkek, 2'si kadındı. Ortalama yaş 47 (5-68) olup 6 olgu (%46) 51-60 yaş aralığındaydı. 11 olguda (%73) akut (hemorajik) pankreatit, 3 olguda (%20) kronik pankreatit, 1 olguda (%6) primer pankreas karsinomu bulundu.

Sonuç: Alkolün, adli otopsilerdeki pankreas lezyonlarının en önemli etiyolojik faktörü olduğu görüldü. Diğer etiyolojik nedenler olarak; travma, zehirlenmeler ve hipotermi saptandı.

Anahtar Kelimeler: Patoloji, otopsi, pankreatik hastalıklar, etiyoloji

Pancreas diseases and pancreatic injuries can lead to sudden death.¹ Various pancreatic pathologies caused by several etiogenesis can be determined during medico-legal autopsies. Acute/chronic pancreatitis and primary/secondary pancreatic carcinomas might be the sole cause of

death or accompany other causes in autopsy.²⁻⁵ Pancreas rapidly autolysis in post-mortem process. Therefore differential diagnoses of pathological changes of pancreas might be very difficult in forensic pathological practice. The aim of this study is to demonstrate pancreatic lesions, etiological factors and differential diagnosis of pancreatic pathologies in forensic autopsy.

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Material and Methods

Autopsy reports between the years 1999 and 2004 of the Morgue Department of the Council of

Table 1. Etiology, cause of death and pancreatic lesions of cases.

| No | Age/sex | Etiology | Pancreatic lesions | Cause of death |
|----|---------|--------------------------------------|--------------------|--------------------------------------|
| 1 | 65/ M | Alcohol abuse | Adenocarcinoma | Adenocarcinoma |
| 2 | 40/ F | Organophosphorus pesticide poisoning | AHP | Organophosphorus poisoning |
| 3 | 60/ M | Homeless/? | AP | Multiorgan failure |
| 4 | 39/ M | Alcohol abuse | CP | Gastrointestinal hemorrhage |
| 5 | 55/ M | Hypothermia | AHP | AHP |
| 6 | 65/ M | Homeless/? | AP | Acute pancreatitis |
| 7 | 26/ M | Alcohol abuse | AP | Acute pancreatitis |
| 8 | 54/ M | Physical assault /trauma | AHP | General body trauma/ hemorrhage |
| 9 | 38/ M | Physical assault /trauma | AHP | General body trauma/hemorrhage |
| 10 | 68/ M | Physical assault /trauma | AHP | General body trauma/brain hemorrhage |
| 11 | 5/ F | Mushroom poisoning | AHP | Mushroom poisoning/liver failure |
| 12 | 62/ M | Alcohol abuse | CP | Complication of chronic pancreatitis |
| 13 | 50/ M | Alcohol/drug abuse | CP | Complication of chronic pancreatitis |
| 14 | 47/ M | Homeless/ hypothermia | AHP | Complication of hypothermia |
| 15 | 37/ M | Homeless/alcohol abuse | AHP | AHP |

AHP: Acute hemorrhagic pancreatitis, **AP:** Acute pancreatitis, **CP:** Chronic pancreatitis.

Forensic Medicine were reviewed retrospectively and 15 cases with pancreatic pathologies were evaluated according to cause of death, sex, and age using crime scene investigation reports, as well as histopathological and toxicological reports. Diagnoses of pancreatic lesions in forensic autopsy were discussed with respect to etiological factors and differential diagnosis.

Results

Of the cases, 13 (86%) were male, 2 were female. Mean age was 47.4 ± 17 (5-68) years, 6 cases (46%) were between 51-60 years. 11 cases (73%) of acute (hemorrhagic) pancreatitis, 3 cases (20%) of chronic pancreatitis, and only one case of primary pancreatic carcinoma were detected. Etiological factors and cause of death are demonstrated in Table 1 together with pancreatic lesions.

Macroscopic view of pancreatic carcinoma was located in the head of the pancreas. Tumor was firm, with a yellowish gray and brilliant cut surface. Acute pancreatitis cases were edematous, hemorrhagic and fat necrosis. Chronic pancreatitis cases were nodular, hard, and deformed. One case of chronic pancreatitis was atrophic.

Microscopic view of acute (hemorrhagic) pancreatitis; diffuse interstitial edema, leukocytic infiltration, necrosis and hemorrhage of pancreatic

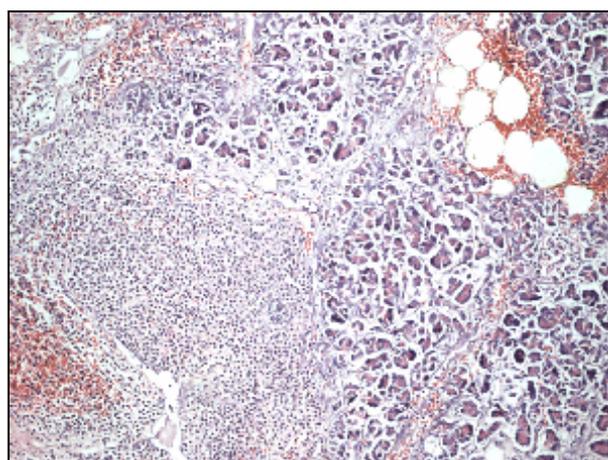


Figure 1. Acute pancreatitis; leukocytic infiltration, necrosis and hemorrhage of pancreatic tissue (HEX100).

tissue (Figure 1) and chronic pancreatitis; peri and intralobular sclerosis with parenchymal atrophy, slightly mononuclear interstitial inflammatory infiltration and fat necrosis (Figure 2) are presented. Also, microscopic view of primary pancreatic carcinoma; desmoplastic reaction, nuclear pleomorphism, loss of polarity, signet ring cells (Figure 3) and autolysis of pancreas is seen in Figure 4.

Discussion

This study documents the presence of morphological alterations due to pancreatic lesions at

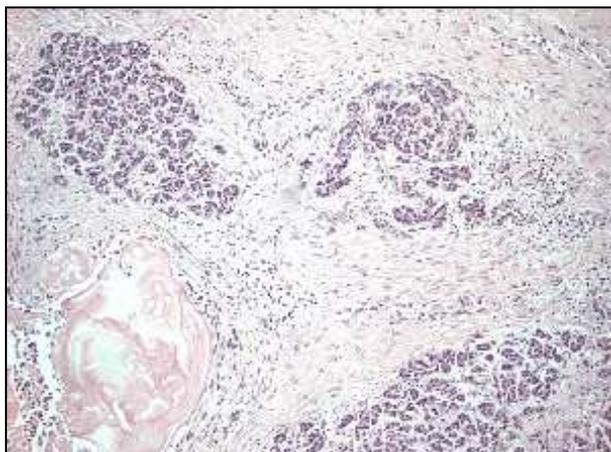


Figure 2. Chronic pancreatitis; peri and intralobular sclerosis, slightly mononuclear interstitial infiltration, fat necrosis (HEx100)

medico-legal autopsy and their etiological factors.

Obstruction of pancreatic ducts caused by stone is the most common etiological factor of acute pancreatitis in surgical pathology. Additionally, alcohol, hypercalcemia, metabolic factors, trauma, shock, vascular and infectious factors are other etiological factors of acute pancreatitis.^{3,6} On the other hand in forensic autopsy, alcohol, trauma, poisoning, shock and hypothermia are common etiological reasons of acute pancreatitis.^{3,4,7} In the current study, acute (hemorrhagic) pancreatitis was detected in 11 cases. Etiological factors were alcohol abuse in 2 cases, hypothermia in 2 cases, trauma in 3 cases and poisoning in the remaining 2 cases in this group. Etiology of 2 homeless cases could not be explained since there was no hospitalization process. However, one of them died due to acute pancreatitis, the other one due to multiple organ failure. Alcohol, chronic diseases due to lack of hygiene etc. might be among probable reasons.

Chronic pancreatitis is characteristically seen in middle aged males and alcohol addicts.^{6,8} There were 3 cases of chronic pancreatitis in this study. All of these cases were male, in 51-60 age range and had a history of alcohol abuse.

Alcohol is the primary cause of both, acute and chronic pancreatitis in most developed countries.^{3,9} About one-third of acute pancreatitis in the

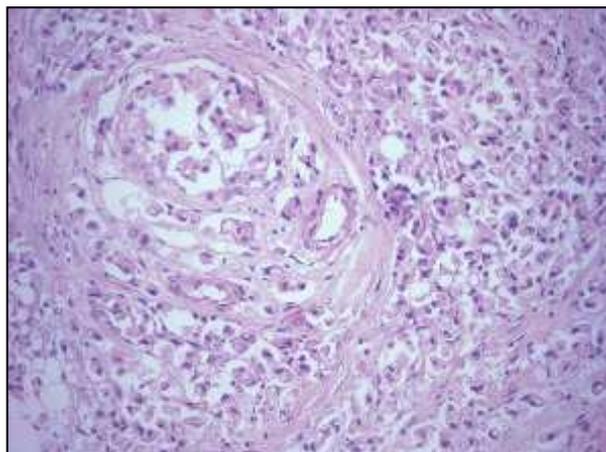


Figure 3. Pancreatic adenocarcinoma; desmoplastic reaction, nuclear pleomorphism, loss of polarity, signet ring cells (HEx200)

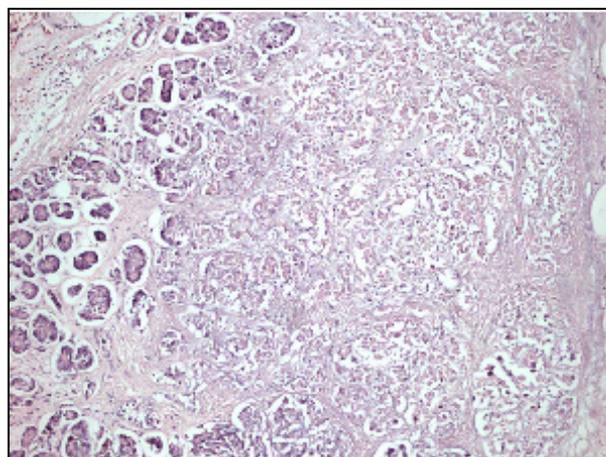


Figure 4. Pancreatic autolysis (HEx100).

United States is alcohol-induced and alcohol is also the primary reason in 60%-90% of chronic pancreatitis in the United States and other developed countries. Both forms are more common in men. The progress of chronic pancreatitis is proportional to the dose and duration of alcohol consumption. Also, postmortem studies revealed sub-clinical chronic pancreatitis in another 10% of alcohol users.^{6,9}

Pancreatic carcinoma is the fifth leading cause of cancer deaths in the United States. During the last 40 years, incidence of pancreatic carcinoma has increased three times and mostly found at 60-80 age range. Tobacco, alcohol and chronic pan-

creatitis are its etiological factors.^{2,5,10} In this study, a pancreatic adenocarcinoma was found in a 65 year-old man with a history of alcohol abuse.

Hypothermia has been described in forensic literature but reports of occurrence in hospitalized patients are rare. Associated lesions include acute hemorrhagic pancreatitis.⁴ Possible mechanisms for common association of hypothermia and pancreatitis are either that ischemic pancreatitis may result from the microcirculatory shock of hypothermia and, both hypothermia and pancreatitis may develop secondary to alcohol abuse or that severe pancreatitis may be the primary disease and hypothermia a result of the patients' social circumstances.^{11,12} In this study, there were 2 cases of acute hemorrhagic pancreatitis due to hypothermia.

Autolysis coincides with the activity of certain enzymes, i.e. the autolytic enzymes present in the live cells that lead to the lysis of the cell's own components after death. During the autolytic process, a hydrolytic splitting of proteins, nucleic acids, carbohydrates, and fats occur. The autolytic process is dependent on various factors; temperature, air humidity, and other environmental influences.¹ The suprarenal glands are among the most susceptible organs. Pancreatic autolysis occurs more rapidly than autolysis of other organs. Differential diagnosis is made microscopically.^{1,13}

Medico-legal autopsy studies analyzing sudden death in outpatients often lack detailed information about the clinical status preceding death; therefore conclusions are based mainly on autopsy findings and police reports. The same situation is a confounder for this study, too.

Conclusion

In this study, 15 forensic autopsy cases of sudden death with pancreatic lesions due to different etiological factors are examined. The results of this

study also confirm the well established fact that alcohol is the most important etiological factor of pancreatic lesions in forensic autopsy. Alcoholic pancreatitis was present in 6 of 15 cases. Trauma, poisoning and hypothermia were found as other etiological factors.

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