Case Report

Sudden Death Due to Acute Hemorrhagic Pancreatitis: A Case Report

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Abstract

Sudden unexpected deaths pose a challenge for the forensic pathologists. Usually relates to cardiovascular cause and such deaths due to gastrointestinal related pathology are uncommon. Acute pancreatitis is a major etiology of gastrointestinal sudden deaths. It is mainly associated with gallbladder stones and alcoholism. We report a case of a 48-year-old man, chronic alcoholic, who was brought dead to hospital after complaints of abdominal pain and vomiting. The postmortem examination revealed the death due to acute hemorrhagic pancreatitis. Literature shows pancreatitis to be significantly associated with alcoholic liver disease. The present case reemphasizes the importance of examination of retroperitoneal space during autopsy and how ancillary investigations such as histopathology, chemical analysis, measuring serum amylase, lipase and vitreous glucose levels help in arriving at final diagnosis.

Keywords: Sudden death, Pancreatic haemorrhage, Pancreatic necrosis, Alcoholic liver disease, Acute hemorrhagic pancreatitis

Introduction

Sudden and unexpected death occurs within 24 hours of the onset of symptoms in an individual not known to be suffering from disease, injury, or poisoning. Cardiovascular disease constitutes the maximum percentage of sudden deaths (45-50%), followed by respiratory (15-25%), central nervous system (10-20%), gastrointestinal tract (GIT) (6-8%), genito-urinary system (3-5%) and various pathologies (5-10%). Acute hemorrhagic pancreatitis is one of the major causes of GIT-associated sudden deaths.[1]

Acute pancreatitis is an inflammatory process of the pancreas caused by the gland's digestive enzymes, which destroy the gland by auto-digestion.[2] Southern states of India have the highest incidences of pancreatitis (114 to 200 per 100,000 population).[3] Global incidence is 30 to 40 cases per 100,000 population per year. [4] Most patients present with mild pancreatitis, usually self-limiting within a week and rarely fatal. About 25% of the patients present with or develop severe pancreatitis and hemorrhagic necrosis, with a mortality rate of up to 50%. 75% of acute pancreatitis is due to either gallbladder

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stones or alcoholism.[5] In Eastern Europe, alcohol is the primary cause of acute pancreatitis. It accounts for up to one-third of pancreatitis cases throughout North America and Europe.[6] Acute pancreatitis is first diagnosed during autopsy in 30-42% of cases.[7] Kumar Shetty et al. retrospectively reviewed four years of autopsies for cases of sudden unexpected death. Among 274 sudden unexpected deaths, only seven deaths (2.5% sudden unexpected deaths) were due to acute hemorrhagic pancreatitis.[8] The present case discusses such an uncommon sudden death due to hemorrhagic necrosis of the pancreas.

Case Report

A 48-year-old male presented to the emergency department with complaints of abdominal pain since morning 9.00 AM and an episode of vomiting containing undigested food particles. At 5.00 PM, he was found unresponsive at home and brought to the hospital at 05.45 PM and was declared brought dead on arrival. He was well till the previous day, a known chronic alcoholic for the past fifteen years with no other known comorbidities. The dead body was shifted to the mortuary for a medicolegal autopsy.

During the external examination, it was observed that the individual was thin-built. No external injury was noted over the body. Conjunctival congestion was present over the eyes. Bluish discoloration of the fingernail beds was noted. During an internal examination, 200 ml of hemorrhagic fluid was in the peritoneal cavity. The retroperitoneal region was hemorrhagic and deeply congested. The entire pancreas was hemorrhagic (**Figure-1)**. On histopathological examination of the pancreatic tissue, neutrophilic infiltration and hemorrhagic necrosis led to a massive hemorrhagic infarction of the pancreas (**Figure-2**). The microscopic examination of liver tissues revealed alcoholic steatosis (70%) of micro- and macro-vesicular types. The lungs, kidneys, and brain were histologically within normal limits. Ancillary postmortem investigations showed a vitreous glucose level of more than 200 microgram/dl and markedly elevated serum amylase and lipase level of more than 1000 U/L. The cause of death of the individual was opined as acute haemorrhagic pancreatitis. The chemical analysis of the viscera was negative for any poison, toxin or drug. The alcohol measures were within normal limits.

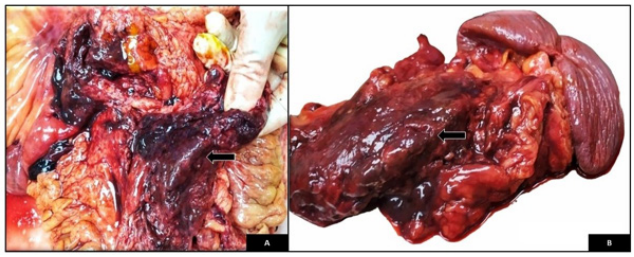

Figure-1: (A) Showing hemorrhagic and deeply congested retroperitoneum region. (B) Dissected pancreas with spleen shows extensive hemorrhage over the surfaces of the pancreas (black arrow).

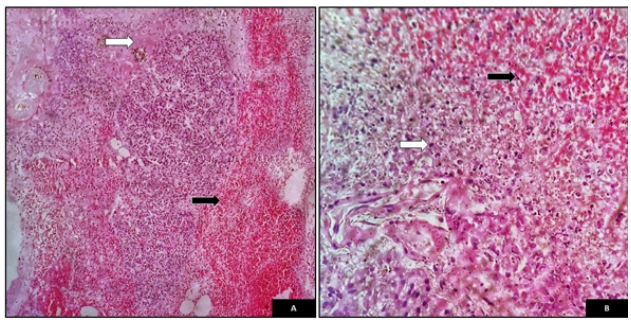

Figure-2: (A) Showing H&E staining of the pancreatic tissue (10X), there is hemorrhage (black arrow) surrounding the normal parenchyma and a pale area of necrosis (white arrow). (B) Showing H&E staining of the pancreatic tissue (40X), there is neutrophilic infiltration (white arrow) and hemorrhagic necrosis (black arrow).

Discussion

Mild acute pancreatitis may rapidly progress into a hemorrhagic form accompanied by massive pancreatic necrosis.[8] Alcohol, due to oxidative stress mediated by reactive oxygen species on the acinar cells, destabilizes the zymogen granules and lysosomes, causing inflammation. It also affects ductal epithelium and stellate cells, resulting in the formation of protein plugs and pancreatic fibrosis in those cells.[9] Further, the necrotizing process initiates extravasation of exocrine proteolytic enzyme-rich fluids leading to elastolytic erosions of adnexal vascular structure, rendering them susceptible to rupture and causing hemorrhagic pancreatitis.[10] Acute pancreatitis typically presents clinically with abdominal pain in 95% of cases, followed by nausea and vomiting (90%).[11] Alcoholic pancreatitis is more common in men.[7] The clinical presentations are similar to those in our present case.

Murthy et al. studied five cases of acute hemorrhagic pancreatitis. Two of these cases had

sudden unexpected deaths during sleep, and three died within twenty-four hours of admission. Similar to our case, all these five cases had gross hemorrhage over the surface of the pancreas, and microscopic features of acute inflammation and hemorrhage were present.[12] Tsokos and Braun retrospectively reviewed 6178 autopsies. Among these cases, twenty-seven cases (0.4%) were of sudden death due to acute pancreatitis. Of these, gross hemorrhage over the surface was present in twenty-four cases. Histopathology of these cases showed large areas of hemorrhagic necrosis of pancreatic tissue. The authors also noted extensive fat necrosis of peripancreatic tissue. The study found that first attacks of acute pancreatitis are associated with higher mortality rates than episodes of relapsing pancreatitis.13 Tümer and Dener studied the incidence of sudden death due to acute pancreatitis, retrospectively reviewing medicolegal autopsy records of ten years. Of 3305 autopsy records, twelve patients (0.36%) died suddenly due to acute hemorrhagic pancreatitis. The study excluded deaths due to symptomatic acute pancreatitis.14 Kumar Shetty et al. also noted massive hemorrhage and necrosis in histopathology.[8] The present case also observes similar histopathological findings.

Renner et al. studied the association between alcoholic liver disease and pancreatitis. Renner et al. reviewed the autopsy records of 1022 patients with alcoholic liver disease. Among them, 352 patients died of illnesses related to cardiac and pulmonary conditions. The histopathological features of pancreatitis were found in 203 cases (20%). In the control group, the prevalence of pancreatitis was only 2.6 %. Therefore, a significant association ($p < 0.001$) was observed between alcoholic liver disease and pancreatitis.[15] The present case also observed associated alcoholic steatosis of the liver with hemorrhagic pancreatitis.

In our case, the postmortem serum amylase and lipase level was more than 1000 U/L, and the vitreous glucose level was more than 200 microgram/dl. Brown and Prahlow also suggested that similar markedly elevated postmortem serum amylase, lipase, and vitreous glucose levels may offer corroborating evidence of acute pancreatitis.[16] The differentiation between hemorrhagic pancreatitis and the phenomenon of autolysis is made by microscopic examination showing acute inflammatory cells and the overall state of decomposition of the dead body.

Conclusion

The gross and microscopic features are confirmatory of hemorrhagic pancreatitis. Alcoholic steatosis of the liver is the most associated etiology, usually with no other systemic involvement. Alcohol consumption is the major risk factor. Many cases of acute pancreatitis present with typical symptoms and findings such as pain abdomen, vomiting, etc. Few cases may cause sudden unexpected death without any symptoms. Forensic pathologists who deal with such sudden unexpected death should not disregard the examination of the pancreatic region.

Declarations

Conflict of Interest: There is no conflict of interest.

Source of Funding: Nil.

Ethical Clearance: Not required.

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