DOI: 10.7860/JCDR/2016/17910.7960

Case Report

Microbiology Section

Acute Pancreatitis, Hepatitis and Bone Erosion in Acute Yellow Phosphorous Compound Poisoning – A Rare Complication

PRABHAKAR KAMARTHI[1], PARIMALA SUBRAMANI[2], ARUN VARDHARAJU GOPU[3], REDDY PRASAD[4], CHANDRAKALA SRINIVASA[5]

ABSTRACT

We report a case of acute pancreatitis and hepatitis following ingestion of yellow phosphorous. The condition of the patient progressed to encephalopathy and bony erosion of the nasal septum. Fungal mass was observed in both the nasal cavities by endoscopy. Microbiological investigation revealed the identity of the fungus as *Aspergillus flavus* and *Candida tropicalis*. Patient improved with fluconazole treatment.

Keywords: *Aspergillus flavus*, *Candida tropicalis*, Fungal mass

CASE REPORT

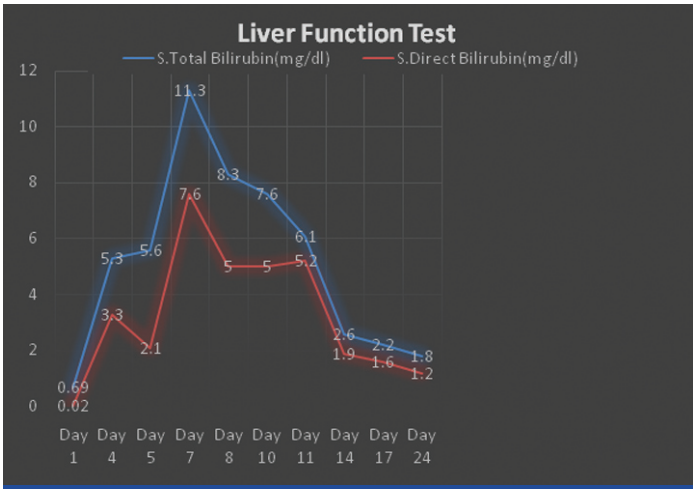
A 23-year-old female patient was brought to the casualty with an alleged history of consumption of Ratol paste - 3% yellow phosphorous 6 hours before she presented to the department of Emergency Medicine. At admission patient's general condition was stable. She was kept under observation and was asymptomatic for 3 days. Initial clinical and laboratory investigations such as Complete Blood Count, Serum Electrolytes, Liver function and Renal function tests did not reveal anything abnormal.

On the fourth day, she developed icterus with a deranged Liver function test following which she was initiated on hepato protective agents. On the fifth day she developed severe abdominal pain for which a surgical opinion was sought. A provisional diagnosis of acute abdomen was made clinically. CT abdomen revealed fatty degeneration of the liver and a bulky pancreas. Further laboratory investigations revealed a serum amylase levels of 1,320 units/l and serum lipase level of 892 units/l, which is suggestive of acute pancreatitis. She was treated with octreotide and pantoprazole infusions for 2 days. Further, patient developed hypotension with ST – T changes on the Electrocardiograph for which she was supported with inotropic agents.

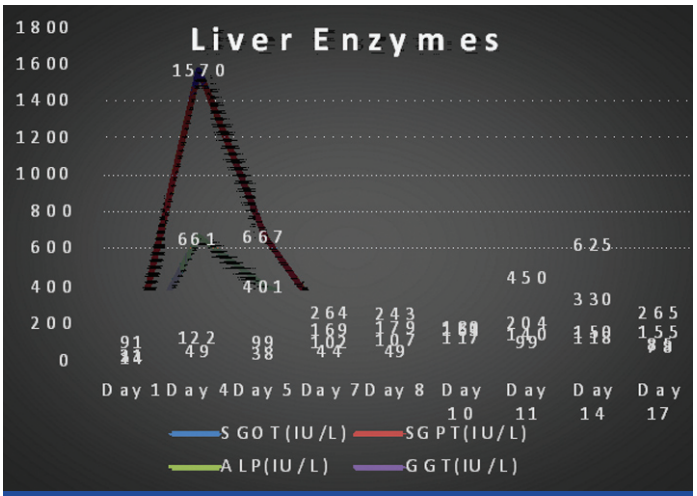
On the ninth day of admission, she developed altered sensorium and was diagnosed with hepatic encephalopathy suggested by an elevation in total bilirubin (11.7), Aspartate transaminase (179), Alanine transaminase (243), Alkaline phosphatase (107), Gamma glutyltransferase (49). She was treated with high bowel wash and was continued with hepatoprotective drugs. Trends in bilirubin levels and liver enzymes are shown in [Table/Fig-1,2]. The patient condition gradually improved and was kept under observation.

On the twentieth day patient complained of pain in the hard palate. Local examination of the palate revealed an ulcer in the hard palate in the midline [Table/Fig-3] for which an ENT opinion was sought. On examination it was found that there was a depression of the nasal bridge with necrosis of the anterior part of the nasal septum, with hard crusts and fungal mass in both the nasal cavities [Table/Fig-4,5].

CT scan of the paranasal sinuses showed perforation in the cartilaginous part of nasal septum. Mucosal thickening in the left maxillary and bilateral ethmoidal sinuses. Surgical debridement of the necrotic nasal septum was done and sent for histopathological and microbiological analysis.

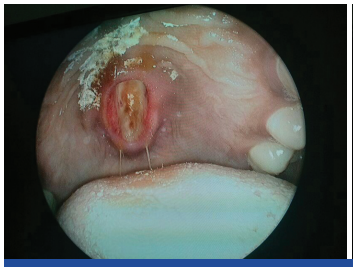
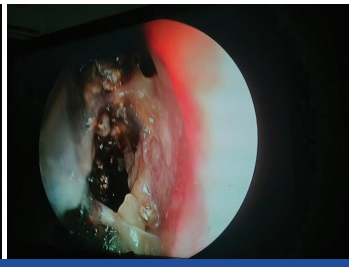


[Table/Fig-1]: Shows the trend of serum bilirubin levels in the patient.

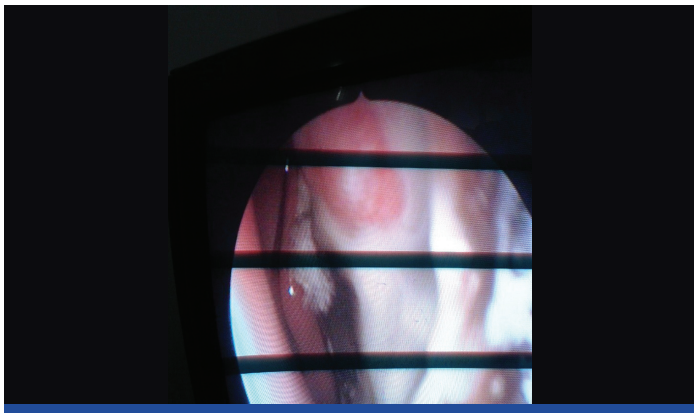


[Table/Fig-2]: Shows trends of liver enzymes in the patient.

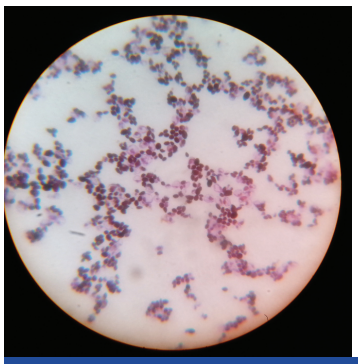
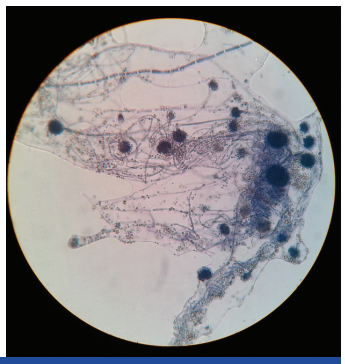
Microbiological investigations revealed the presence of fungal elements on KOH mount. Culture on Blood agar and Sabouraud Dextrose agar was done. Microscopy showed growth of *Candida tropicalis* and *Aspergillus flavus* [Table/Fig-6,7]. *Candida tropicalis* was identified by indigo blue colonies on Chrome agar and A. flavus was identified by Lactophenol Cotton Blue mount (LPCB)

[Table/Fig-3]: Shows an ulcer in the hard palate in the midline.
[Table/Fig-4]: Shows necrosed nasal septum.



[Table/Fig-5]: Shows fungal mass in nasal cavity

[Table/Fig-6]: Shows a gram stain picture of *Candida tropicalis*.
[Table/Fig-7]: LPCB mount of the growth suggestive of *Aspergillus flavus*.

following slide culture technique. The pathogenicity of these two isolates was established by repeat isolation of both fungi from the same site. Aerobic culture was negative for bacterial growth. Antifungal susceptibility testing was done for *Candida tropicalis* as per Clinical Laboratory Standards Institute (CLSI) guidelines [1].

The isolate was sensitive to Fluconazole, Voriconazole and Amphotericin B. She was treated with Fluconazole 100mg BID for 3 weeks. Further the patient's condition improved and she was discharged uneventfully.

DISCUSSION

Red and yellow are the two forms in which elemental phosphorus occurs. Yellow phosphorus (also known as white phosphorus) is used in fireworks and in rodenticides. In rodenticides, which are available in the form of paste or powder, yellow phosphorus can be present in 2-5% [2]. Yellow phosphorus is a severe local and systemic toxin causing damage to gastrointestinal, hepatic, cardiovascular and renal systems. Yellow phosphorus is extremely lethal when ingested as confirmed by the report published by Fernandez and Canizaresin 15 patients with a mortality of 27% [3].

There are three stages in which the clinical features of acute poisoning with yellow phosphorus have been classically divided. Gastrointestinal stage characterized by vomiting, nausea and abdominal pain occurring within 24h with normal laboratory tests, is the first stage. An asymptomatic stage, with laboratory investigations, that reveal hepatic picture is the second stage. Finally the third stage of acute liver failure progressed by these changes which may even necessitate liver transplantation [4].

Acute Yellow phosphorus compound poisoning has been known to cause hepatotoxicity and cardio toxicity. Acute pancreatitis due to yellow phosphorus has never been reported in literature in our region to the best of our knowledge. Some of the toxins that are known to cause acute pancreatitis are ACE inhibitors, Aspirin, Proton pump inhibitors, atypical antipsychotics, HMG-COA reductase inhibitors, oral contraceptives, HAART therapy [5]. In previous years, experts created a classification system that addressed the likelihood that certain drugs would be associated with acute pancreatitis, using the categories of definite, probable, and questionable/possible [5]. Over the years, the list of medications associated with acute pancreatitis have increased [4,5].

Further our patient developed fungal infection and the probable cause could be prolonged antibiotic use. Fungal rhino-sino-cerebral infection is a well described complication among immuno-compromised individuals [6-8]. However, localized fungal infections involving only the nasal septum are rare. In this case it's a dual invasive infection with *Aspergillus flavus* and *Candida tropicalis*. *Candida tropicalis* is a non *albicans candida* species, the treatment of which is difficult as they are resistant to the azoles. For isolated nasal septal aspergillosis, predisposing risk factors include trauma or surgical procedures, severe immune suppression, broad spectrum antibiotic therapy and prolonged neutropenia [6-8]. Aspergillosis in our case might be the consequence of prolonged antibiotic therapy. Once nasal septal fungal infection is suspected, treatment includes surgical debridement and antifungal agents [8].

Voriconazole is the primary drug of choice for invasive Aspergillosis for duration of at least 6–12 weeks [9]. Therapy can be extended beyond this period depending on the clinical response and immune status of the patient.

CONCLUSION

We hereby report a case of acute pancreatitis and hepatitis as a result of acute yellow phosphorus compound poisoning who developed an isolated nasal septal necrosis caused by *Aspergillus flavus* and *Candida tropicalis*. To the best of our knowledge, acute pancreatitis as a complication of acute yellow phosphorus poisoning is rare. Here in this case, development of isolated nasal septum necrosis due to *Aspergillus flavus* and *Candida tropicalis* in an immune competent individual is another rarity. The probable cause of fungal nasal septal necrosis was prolonged use of antibiotics. Serious complications associated with nasal septal abscess are meningitis, brain abscess followed by septicemia if left undiagnosed and treated; hence finding a definitive etiology will help in initiation of appropriate therapy and prevent complications.

REFERENCES

[1] NCCLS. Method for Antifungal Disk Diffusion Susceptibility Testing of Yeasts; Approved Guideline. NCCLS document M44-A (ISBN 1-56238-532-1). NCCLS, 940 West Valley Road, Suite 1400, Wayne, Pennsylvania 19087-1898 USA, 2004.
[2] Brent J, Wallace KL, Burkhart KK, Phillips SD, Donovan JW, editors. Critical Care Toxicology –Diagnosis and Management of the Critically Poisoned Patient. Philadelphia, PA: Elsevier Mosby; 2005. pp. 851–61.
[3] Fernandez OU, Canizares LL. Acute hepatotoxicity from ingestion of yellow phosphorus-containing fireworks. *J Clin Gastroenterol*. 1995;21:139–42.
[4] Badalov N, Baradarian R, Iswara K, Li J, Steinberg W, Tenner S. Drug induced acute pancreatitis: an evidence-based review. *Clin Gastroenterol Hepatol*. 2007;5(6):648–61.
[5] Trivedi CD, Pitchumoni CS. Drug-induced pancreatitis: an update. *J Clin Gastroenterol*. 2005;39(8):709–16.
[6] Debnam JM, Gillenwater AM, Ginsberg LE. Nasal septal abscess in patients with immunosuppression. *AJNR Am J Neuroradiol*. 2007;28(10):1878–79.

[7] Siberry GK, Costarangos C, Cohen BA. Destruction of the nasal septum by Aspergillus infection after autologous bone marrow transplantation. *N Engl J Med*. 1997;337(4):275–76.
[8] Baydala LT, Yanofsky R, Akabutu J, Wenman WM. Aspergillosis of the noseand paranasal sinuses in immunocompromised children. *CMAJ*. 1988;138(10):927–28.
[9] Walsh TJ, Anaissie EJ, Denning DW, Herbrecht R, Kontoyiannis DP, Marr KA, et al. Treatment of aspergillosis: clinical practice guidelines of the Infectious Diseases Society of America. *Clin Infect Dis*. 2008;46(3):327–60.

PARTICULARS OF CONTRIBUTORS:
1. Professor, Department of Medicine, Sri Devaraj Urs Academy of Higher Education and Research (SDUAHER), Tamaka, Kolar, Karnataka, India.
2. Assistant Professor, Department of Microbiology, SDUAHER, Tamaka, Kolar, Karnataka, India.
3. Post Graduate, Department of Medicine, SDUAHER, Tamaka, Kolar, Karnataka, India.
4. Assistant Professor, Department of Medicine, SDUAHER, Tamaka, Kolar, Karnataka, India.
5. Assistant Professor, Department of ENT, SDUAHER, Tamaka, Kolar, Karnataka, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Dr. Parimala Subramani,
Assistant Professor, Department of Microbiology, SDUAHER, Tamaka, Kolar, Karnataka, India.
E-mail: mjchand@gmail.com

FINANCIAL OR OTHER COMPETING INTERESTS: None.

Date of Submission: **Nov 22, 2015**
Date of Peer Review: **Feb 04, 2016**
Date of Acceptance: **May 01, 2016**
Date of Publishing: **Jun 01, 2016**