

Cocaine use and intestinal perforation.

A case report.

Alberto Medina Benítez M.D.
Sergio Enrique López Juárez M.D.
Leticia Martínez Pérez M.D.
Ricardo Chávez Coss M.D.
Abdel Ivo Loe Hernández M.D.
Ricardo Durán Reyes M.D.
Mariana Sofía Trejo García M.D.
Tamaulipas, Mexico.

Case Report

General Surgery



BACKGROUND: Cocaine is the second most consumed illegal drug in Mexico, it has multiple effects on the organism, one of them is mesenteric ischemia that can originate intestinal perforation.

Clinical case: We present the case of a young patient who underwent exploratory laparotomy with the finding of ileum perforation, associated with a history of cocaine consumption 12 hours prior to the onset of symptoms.

Conclusion: In a case of mesenteric ischemia without evident cause and without risk factors in a young patient, cocaine use should be considered as a differential diagnosis.

KEY WORDS: Intestinal perforation, cocaine, mesenteric ischemia.

Introduction

Cocaine is obtained from *Erythroxylon coca*, a plant that has its origin in South America¹. According to the National Survey of Drug, Alcohol and Tobacco Use 2016-2017, in Mexico, cocaine is the second most consumed illegal drug, behind marijuana, the highest prevalence of its use is among the population aged 18 to 34², more common in men than in women, which has been increasing in recent years. It has its main effects on the central nervous system and cardiovascular, pulmonary, renal and gastrointestinal complications have also been published. At the digestive level, it produces persistent mesenteric ischemia due to vasoconstriction, conditioning gastric or duodenal ulcers and even intestinal perforation³.

Mesenteric ischemia was first documented in 1895, it is more common in the elderly due to the presence of comorbidities such as atherosclerosis, heart disease, chronic kidney disease, among others⁴. Acute mesenteric ischemia can be due to arterial embolism, arterial thrombosis, mesenteric venous thrombosis or non-occlusive pathologies, such as cocaine intake⁵.

Intestinal perforation is a cause of acute abdomen and there are various etiologies such as obstruction, inflammatory bowel disease, diverticular disease, ischemia, radiation, foreign bodies, vasculitis, tumors, infections and trauma⁶.

The objective of this work is to review the literature and present the case of a young patient with terminal ileum perforation, associated with a history of intense cocaine use prior to the onset of symptoms.

Case report

He is a 35-year-old male, with grade 1 obesity according to the body mass index (31 kg/m²), without chronic degenerative diseases, who arrives at the emergency area for abdominal pain in mesogastrium, hypogastrium and right iliac fossa of 24 hours of evolution, accompanied by diarrhea and fever of 38.3 ° C. On the physical examination dehydrated, tachycardial, normotensive, at the abdominal level it is distended, without peristalsis, painful to palpation in a generalized way, blumberg positive, with frank data of acute abdomen. Laboratories show leukocytosis of 14,000 (leuc/mm³) deviation to the left 82%, clotting times and blood chemistry within normal parameters. Tomography of the abdomen is performed showing free air in the abdominal cavity with suspected intestinal perforation at the terminal ileon level (**Figure 1**). Urgent scout laparotomy is protocolized and performed. Within the findings we observe distension of handles of the small intestine, 500cc of liquid free of intestinal appearance, culture samples are taken, 15 cm from the ileocecal valve perforation of 10 mm on antimesenteric edge of terminal ileon (**Figure 2**), 10 cm are resected in total (5cm distal and 5cm proximal), with terminal anastomosis in two planes, abdominal cavity washing is performed with 2 liters of saline solution 0.9%, macroscopically without evidence of injuries in mesentery or other organs, so cavity is closed on a regular basis. The patient undergoes his postoperative period in adequate general conditions, with double antibiotic regimen (ceftriaxone and metronidazole) and starting orally at 48 hours.

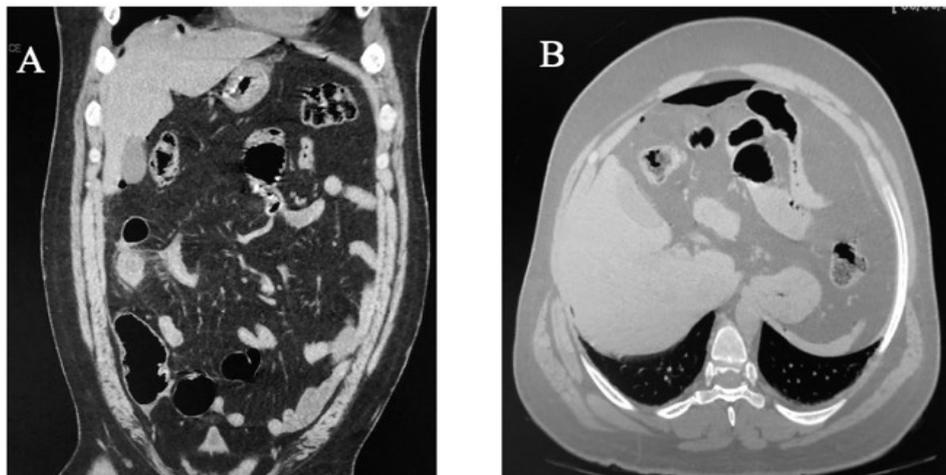


Figure 1. Computed tomography of the abdomen. A) Coronal CT scan with inflammatory process at the terminal ileum level B) axial CT scan with evidence of open air in the abdominal cavity.

Cultures reported *Escherichia Coli* sensitive to the antibiotics used. The surgical piece was analyzed with the pathology service where puntiform perforation is identified, attention was drawn to ischemic process secondary to thrombophlebitis with necrosis arranged linearly with the rest of the surgical piece intact, in young patient without a pathological history of importance for his condition, infectious and tumor process with histochemistry staining is ruled out (**Figure 3**). The patient evolves favorably and graduates on day 6 of the postoperative period. Follow-up is given in the outpatient consultation at week 2,4, 8 and 12 without complications.

Discussion

Cocaine produces multiple effects, the first description in the digestive tract was made in 1985 by Nalbandian⁷ and that same year Fishel⁸ proposed cocaine colitis syndrome. It can cause ischemia, ulcers, bleeding and perforation. It mainly affects the stomach and first portion of the duodenum; less



Figure 2. Small bowel perforation

frequently the lower ileum, caecum, splenic flexure and rectosigmoid junction, as they are the areas with the least blood flow⁴. Splenic condition⁹ and complications in newborns due to maternal consumption during pregnancy have been mentioned in the literature^{10,11}. The route of administration can be oral, inhaled, intravenous and intramuscular. The effects are produced by their pharmacological action, by blocking the recapture of noradrenaline in presynaptic terminals, accumulating in synaptic clefts and perpetuating its effect on alpha adrenergic receptors present in mesenteric vasculature, conditioning persistent vasoconstriction mediated by an increase in calcium flux in the membrane of endothelial cells¹², leading to focal tissue ischemia and sometimes perforation^{9,13,14}. Cocaine generates a prothrombotic state by platelet aggregation, stimulation of the activity of the plasminogen activator inhibitor and antithrombin 3 diminution^{1,9,13}. Blocking sodium channels generates an anesthetic effect¹⁵.

Symptoms associated with intestinal ischemia due to cocaine use occur within the first 48 hours, the most common is abdominal pain and bloating, nausea, vomiting, diarrhea and fever in case of perforation^{4,14}. Abdominal tomography may show thickening and changes in intestinal wall attenuation, dilation of intestinal lumen, congestion of mesenteric vessels, mesenteric free fluid and changes in mesenteric fat¹⁶. The use of angiography and endoscopy can be considered within the initial approach, although their use is limited. The half-life of the substance in the body is 6 hours, it is eliminated in the urine and the metabolite detected is benzoylecgonine, which can be positive for up to 2 weeks after use^{1,9}.

Treatment will depend on the clinical conditions of the patient, initially conservative with intravenous hydration based on crystalloids, antibiotics and analgesics, the vast majority of cases seem to be self-limiting¹⁷. On the other hand, if the patient presents leukocytosis, fever, imaging studies suggestive of perforation and peritonitis data, he will

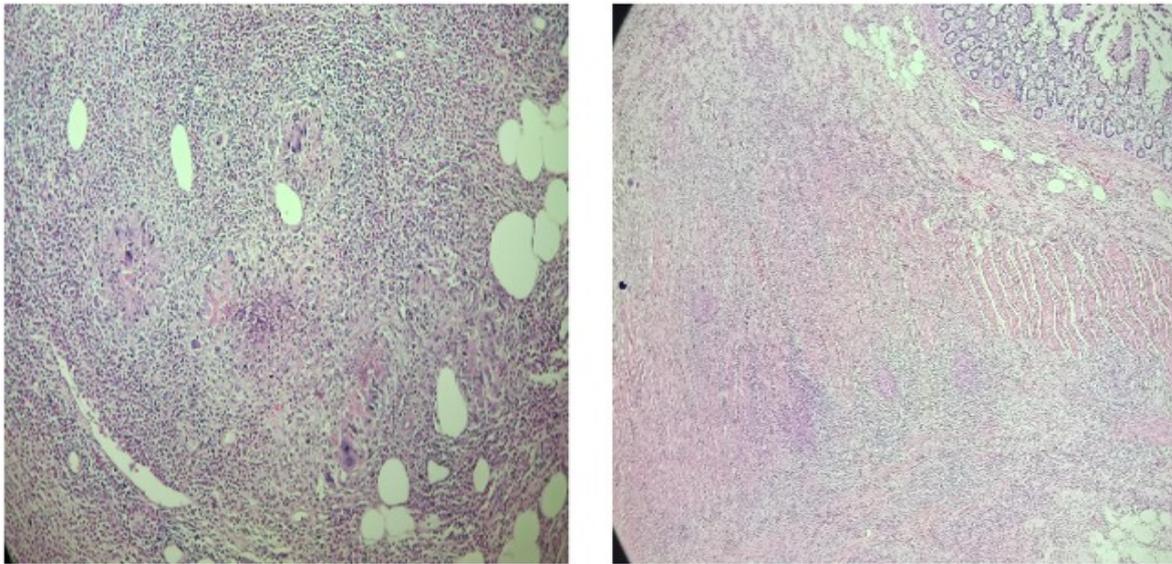


Figure 1. H&E 4x and 10x microphotography with necrotizing thrombophlebitis and mucosal ischemia, accompanied by chronic foreign body-type inflammatory reaction.

merit surgical examination with resection of the compromised segment, as in the case of our patient. Elramah et al, conducted a case-control study that demonstrated a mortality of 26% in patients with cocaine-related intestinal ischemia and 7.7% of ischemia not associated with it, as well as an increase in the need for surgery in the association with the drug¹⁸. Mortality reported in case of surgery it can be 50%¹⁷.

Cocaine use in our country is more frequent than in recent years, it remained relatively stable between 2002 and 2011; however, in subsequent years there is an increase in men's consumption from 0.9% (274,843) to 1.4% (573,236)². In Mexico, the report of blind perforation¹⁹, a sigmoidectomy due to stenosis secondary to chronic mucosal ulceration²⁰ and a destruction of the palatine is documented²¹. Probably due to low diagnostic suspicion, cases are underestimated.

Regarding this case, the initial diagnostic impression was complicated acute appendicitis, when performing the abdominal tomography we showed pneumoperitoneum that changed the suspicion to terminal ileum perforation. Later due to the transoperative finding, age, absence of comorbidities and evolution time guided us to investigate more unusual causes. Due to the report provided by the pathology service, the interrogation of the patient was carried out again, who said he had used intranasal cocaine 24 hours before his admission to the emergency department, 12 hours before the onset of symptoms. The urinary test for benzoylecgonine tested positive and the serology for HIV negative.

Conclusion

It is important to know the medical complications of one of the most common drugs.

Although gastrointestinal complications are rare, mesenteric ischemia due to cocaine use should be considered in young patients, with acute abdominal pain and no known comorbidities or risk factors. We reaffirm the importance of proper background interrogation in the emergency area, because the patient will hardly mention on his own initiative the use of illegal drugs by delaying timely care, increasing the morbidity and mortality of the condition. This report seeks to provide evidence to the literature.

Conflicts of interests

There was no conflict of interest during the study, and it was not funded by any organization.

Acknowledgements

We fully thanks, to the department of pathology and radiology for their unconditional support.

References

1. Zimmerman JL. Cocaine intoxication. *Crit Care Clin.* 2012 Oct;28(4):517-26.
2. Comisión Nacional contra las Adicciones. Informe sobre la situación del consumo de drogas en México y su atención integral en 2019. Secretaría de Salud, Ciudad de México, 2019. https://www.gob.mx/cms/uploads/attachment/file/477564/Informe_sobre_la_situacion_de_las_drogas_en_Mexico.pdf (acceso 22 julio 2021).
3. Grottesi A, Bianchi L, Ranieri FM, Puce E, Catarci M. Unusual segmental ischemia of the small bowel from cocaine abuse. *J Surg Case Rep.* 2021 Apr 14;2021(4):rjab074.
4. Shaheen K, Alraies MC, Marwany H, Elueze E. Illicit drug, ischemic bowel. *Am J Med.* 2011 Aug;124(8):708-10.

5. Bobadilla JL. Mesenteric ischemia. *Surg Clin North Am*. 2013 Aug;93(4):925-40.
6. Brown CV. Small bowel and colon perforation. *Surg Clin North Am*. 2014 Apr;94(2):471-5.
7. Nalbandian H, Sheth N, Dietrich R, Georgiou J. Intestinal ischemia caused by cocaine ingestion: report of two cases. *Surgery*. 1985 Mar;97(3):374-6.
8. Fishel R, Hamamoto G, Barbul A, Jiji V, Efron G. Cocaine colitis. Is this a new syndrome? *Dis Colon Rectum*. 1985 Apr;28(4):264-6.
9. Shanti CM, Lucas CE. Cocaine and the critical care challenge. *Crit Care Med*. 2003 Jun;31(6):1851-9.
10. The' TG, Young M, Rosser S. In-utero cocaine exposure and neonatal intestinal perforation: a case report. *J Natl Med Assoc*. 1995 Dec;87(12):889-91.
11. Miller BM, Rosario PG, Prakash K, Patel HK, Gerst PH. Neonatal intestinal perforation: the "crack" connection. *Am J Gastroenterol*. 1990 Jun;85(6):767-9.
12. Isner JM, Chokshi SK. Cocaine and vasospasm. *N Engl J Med*. 1989 Dec 7;321(23):1604-6.
13. Muñoz AE, Evans T. Acute gastrointestinal manifestations associated with use of crack. *Am J Emerg Med*. 2001 Jan;19(1):61-3.
14. Martínez-Vieira A, Camacho-Ramírez A, Díaz-Godoy A, Calvo-Durán A, Pérez-Alberca CM, de-la-Vega-Olías C, et al. Bowel ischaemia and cocaine consumption; case study and review of the literature. *Rev Esp Enferm Dig*. 2014 May;106(5):354-8.
15. Brownlow HA, Pappachan J. Pathophysiology of cocaine abuse. *Eur J Anaesthesiol*. 2002 Jun;19(6):395-414.
16. Angel W, Angel J, Shankar S. Ischemic bowel: uncommon imaging findings in a case of cocaine enteropathy. *J Radiol Case Rep*. 2013 Feb 1;7(2):38-43.
17. Ellis CN, McAlexander WW. Enterocolitis associated with cocaine use. *Dis Colon Rectum*. 2005 Dec;48(12):2313-6.
18. Elramah M, Einstein M, Mori N, Vakil N. High mortality of cocaine-related ischemic colitis: a hybrid cohort/case-control study. *Gastrointest Endosc*. 2012 Jun;75(6):1226-32.
19. Flores-Salazar LO, et al. Perforación de ciego por colitis isquémica asociada a uso de cocaína. Reporte de caso. *Rev Chil Cir*. 2017.
20. Alvarado-López FG, Abdo-Francis JM, Pérez-Torres E, Pérez-Pineda J, Aristi-Urista G, Mendoza-Ramírez S. Colitis isquémica asociada al consumo de cocaína; presentación de un caso y revisión de la bibliografía. *Rev Med Hosp Gen Mex*. 2011; 74(4): 219-222.
21. Padilla-Rosas M, Jimenez-Santos CI, García-González CL. Palatine perforation induced by cocaine. *Med Oral Patol Oral Cir Bucal*. 2006 May 1;11(3):E239-42.

Sergio Enrique López Juárez
Department of General surgery
Hospital Regional Ciudad Madero PEMEX
Tamaulipas, Mexico
drlojua@gmail.com