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CASE REPORT
OLGU SUNUMU

Abdominal Computerized Tomography Findings of Synthetic Cannabinoid Intoxication: A Case Report

Sentetik Kannabinoid İntoksikasyonunun Abdominal Bilgisayarlı Tomografi Bulguları: Vaka Sunumu

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ÖZ

Bu vaka sunumunun amacı akut sentetik kannabinoid (SK) intoksikasyonu ile acil servise başvuran genç bir hastada, kendi kendini sınırlayan ve geri dönüşümlü abdominal çok dedektörlü bilgisayarlı tomografi (ÇDBT) bulgularının literature eşliğinde sunulmasıdır. SK intoksikasyonu, ÇDBT'de periportal halo işareti, pankreasın diffüz büyümesi, intra ve peripankreatik sıvı, uzun segment devam eden ince barsak duvar kalınlaşmaları ve barsak ansları arasında serbest sıvı şeklinde bulgular sergilemektedir. Kanımıza göre çalışmamız, SK intoksikasyonun batın ÇDBT bulgularını gösteren ilk çalışma olma özelliği taşımaktadır.

Anahtar Kelimeler: sentetik kannabinoid, abdomen, çok dedektörlü bilgisayarlı tomografi

ABSTRACT

The aim of this case report is the description of self-limiting and completely reversible abdominal findings using multi-detector computerized tomography (MDCT) in case of acute Synthetic cannabinoid (SC) intoxication. SC intoxication presents with findings such as periportal halo sign, diffuse enlargement of pancreas, intra- and peripancreatic fluid, long segment small bowel wall thickening and fluid between dilated intestinal loops at abdominal MDCT. To the best of our knowledge, the study is the first to report abdominal MDCT findings of SC intoxication.

Keywords: synthetic cannabinoids, abdomen, multi-detector computerized tomography

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Introduction

Synthetic cannabinoids (SC) are psychoactive chemical compounds that have been widely abused in recent years, and have quite dangerous effects. SC compounds are called "Spice" in Europe, "K2" in U.S.A, "Kronic" in Australia (1). The very best known example of natural cannabinoids is delta 9-tetrahydrocannabinol (THC) which is the main active compound of marijuana. SCs are synthetically made molecules that mimic THC effects (1). SCs are four to 660 times more potent than marijuana because of their specific structure (2). These compounds bind and activate the cannabinoid receptors CB1 and CB2 with remarkable potency and efficacy. Serious adverse effects that often require medical attention, including severe cardiovascular, gastrointestinal and psychiatric sequelae, are highly prevalent with SC abuse. While the high potency and short half-life of SCs create a strong effect, the heterogeneous structure of SC compounds causes complex clinical effects after their usage (3). It is commonly abused by young adults and the rate of abuse is rapidly increasing because it is cheap, easy to reach, and lacks appropriate control by authorities (1). Recently, increased abuse rate also increased the number of SC intoxication cases admitted to the emergency department. Therefore, we encounter more and more intoxication cases associated with SC abuse. To date, there have been no studies published on the abdominal imaging findings of SC intoxication. The purpose of this study is to present abdominal multi-detector computerized tomography (MDCT) findings of SC intoxication in combination with clinical and laboratory results.

Case Report

A 20-year old, otherwise healthy, male patient was admitted to our emergency department unconscious. He had a history of suddenly developed loss of consciousness. There were no radiologic abnormalities on the computerized tomography scan of the head. Upon physical examination, the patient had tenderness at the upper quadrants and midline of abdomen as well as extensive defense and rebound. His laboratory results were as following: alanine aminotransferase: 103 U/L (10-40 U/L), aspartate aminotransferase: 129 U/L (10-38 U/L), gamma glutamyl transferase: 74 U/L (5-61 U/L), lactate dehydrogenase: 275 U/L (135-225 U/L), magnesium: 2.89 mg/dl (1.58-2.55 mg/dl), troponin T: 379.2 pg/ml (0-100 pg/ml), d-dimer: 22.82 µg/ml (0-0.5 µg/ml), ammonia: 82.7µmol/L (16-60 µmol/L), partial thromboplastin time (PTT): 20.3 sec (9.4-12.5 sec), partial prothrombin time (PPT)-international normalized ratio (INR): 2.82 sec (0.89-1.25 sec), activated partial thromboplastin time (aPTT): 39.5 sec (25.4-36.9 sec) and found to be above normal limits. Serum lipase: 59 U/L (13-60 U/L), amylase 105 U/L (25-115 U/L) was in the normal range. All lipid and hematologic parameters of the patient was also within normal limits. Urine drug screen was positive only for cannabinoid. Because of the suspicious acute abdomen findings on the physical examination, the patient underwent an abdominal ultrasonography scan. The ultrasonography revealed enlarged pancreas, diffuse moderate dilatation of small intestinal loops, thickening of gallbladder wall, normal choledoc and intrahepatic biliary tract and fluid collection at perihepatic, pericholecystic area and the area between intestinal loops. Since the clinical condition of the patient could not be cleared up, the patient underwent a MDCT scan with intravenous contrast. The MDCT revealed significantly diffuse enlargement of pancreas, multiple linear hypodensities throughout pancreas which had the appearance of prominent pancreatic folds, and intra- and peripancreatic fluid in the lesser sac, anterior pararenal space, perivascular space (around the mesenteric root) (Figure 1). No signs of pancreatic trauma were observed, such as local changes in size, attenuation, or discontinuity of the pancreatic structure.

The jejunal and ileal intestinal loops had dilatation, long segment bowel wall thickening, regular thickened mucosal fols, bowel wall enhancement, and free fluid accumulation in the perihepatic space and between dilated intestinal loops (Figure 2). There was no fatty infiltration of the bowel wall, skip lesions, mesenteric adenopathy to

suggest an inflammatory bowel process such as Crohn's disease.

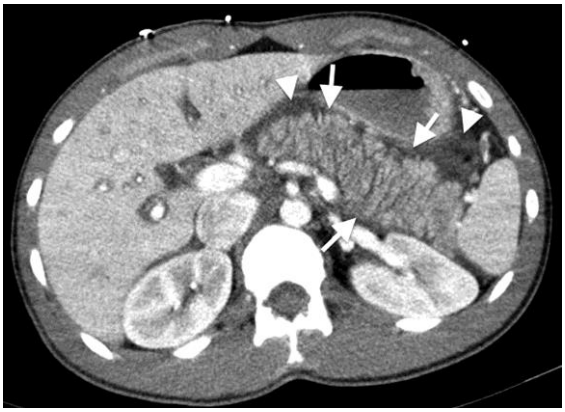

Figure 1: Axial MDCT Images (GE Light Speed Ultra 8 Slice CT, 230 kVp, 3 mm axial slices) of a 20-year-old male with acute SC intoxication at the time of initial presentation. Images shows peripancreatic fluid (arrowheads), multiple linear hypodensities throughout pancreas which had the appearance of prominent pancreatic folds (arrows) and diffuse enlargement of pancreas.

Imaging demonstrated patent vessels without mesenteric atherosclerotic calcification. Calibration and lumen potency of abdominal aorta, celiac trunk, superior mesenteric artery, and inferior mesenteric artery were found normal at axial images and coronal-sagittal reformat images.

Figure 2: Axial MDCT Images (GE Light Speed Ultra 8 Slice CT, 230 kVp, 3 mm axial slices) of a 20-year-old male with acute SC intoxication at the time of initial presentation. Images demonstrate the dilatation and long segment intestinal wall thickening of jejunal and ileal intestinal loops, small bowel wall enhancement and regular thickened mucosal fols (arrows).

MDCT revealed also periportal halo sign which were consistent with periportal hypodense areas observed adjacent to the portal vein and its branches (Figure 3). There was also thickened gallbladder wall on MDCT. Findings of extravasation, free air, solid organ laceration, or space occupying lesion-causing ileus were absent in the abdomen. The patient was admitted to the intensive care unit and received supportive medical treatment. During the follow-up of the patient, he presented with improvements of consciousness and acute abdomen findings. When he regained consciousness, he admitted to being a regular and excessive user of cannabis, and to having done so 2 hours before the loss of consciousness started. A whole abdominal MDCT after 1 week reported completely regression of his findings.

Figure 3: Axial MDCT Images (GE Light Speed Ultra 8 Slice CT, 230 kVp, 3 mm axial slices) of a 20-year-old male with acute SC intoxication at the time of initial presentation. Images shows periportal halo sign consistent with hypodense areas adjacent to the portal vein and its distal branches (arrows).

Discussion

This case presentation is the first to showcase abdominal effects of SC abuse alongside with abdominal MDCT findings. Obvious abdominal MDCT findings were: pancreatitis-like condition characterized with diffuse enlargement of pancreas, intra- and peripancreatic fluid in the lesser sac, periportal halo sign, cholecystitis-like gallbladder wall thickening, and edema with wall thickening at the small intestine presenting like the ischemic changes.

There are only a few numbers of clinical studies available on the physical and psychopathologic effects of SCs. Most of the clinical information on toxicity of SCs could be learned from case presentations, including small case series, animal studies and forensic medicine journals (4). Tanei et al. reported a case of rhabdomyolysis, intracranial hemorrhage, and acute kidney failure associated with SC abuse (5). In addition to that, various acute stroke cases are reported associated with SC abuse (6, 7).

There are several studies on imaging findings of SC associated effects. Most of these studies are limited only with the respiratory system (4, 8). We came across only one study including abdominal imaging findings of chronic SC abuse in the literature. That study reported acute gastric dilatation and portal venous gas findings associated with chronic abuse (9). Our case report was an acute intoxication of SCs and there were no gastric dilatation and portal venous gas findings in our patient.

Enlarged edematous pancreas and pancreatic and peripancreatic fluids are most frequently caused by mild acute pancreatitis (10). Several acute pancreatitis cases have also been reported in the literature associated with marijuana THC usage (11). Since SCs are synthetic THC compounds and cause THC-like effect over CB1 and CB2 receptors, we might consider the pancreatic enlargement and peripancreatic free fluid appearance of our case as the acute mild pancreatitis-like condition. The serum level of amylase and lipase were within normal limits in our case. However acute pancreatitis in the setting of normal amylase and lipase were reported in previous studys (12).

Continuous long segment bowel wall thickening without skip segments, small bowel dilatation and mesenteric free fluid which was seen in our patient may the result of mesenteric ischemia due to SC intoxication. These findings are similar with cocaine enteropathy like ischemic bowel imaging characteristics (13). Cocaine enteropathy is a phenomenon that has been described in the medical literature along with other causes of reversible ischemic bowel disease (14). However, there have been no reports of the imaging findings of SC-induced enteritis.

A variety of diseases and conditions can cause periportal halo (15). Periportal halos due to blood or elevated venous pressure are commonly seen in patients with blunt liver trauma. Periportal edema may cause this sign in patients with congestive heart failure and secondary liver congesion, hepatitis, or enlarged lymph nodes and tumors in the porta hepatis which obstruct lymphatic drainage. We excluded other causes of periportal halo sign in our patient with a thorough history, laboratory test, and imaging apart from hepatitis. We think that the elevated serum liver enzymes of our patient may support hepatitis-like condition.

The aim of this case report is the description of self-limiting and completely reversible abdominal findings using MDCT scan in case of acute SC intoxication. SC abuse should be considered in otherwise healthy young adults who present without underlying systemic disease and suspicion of intoxication with similar findings at abdominal imaging. This study is the first to describe abdominal MDCT signs of SC intoxication. Future studies are required to understand the effects of SC intoxication on intra-abdominal organs and their mechanisms.

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