Can cannabinoids contribute to cholecystitis – a case of gangrenous acalculous cholecystitis

M Bhana,1 Y Perner2

1 Division of Surgery, Department of General Surgery, Pholosong Hospital, South Africa
2 Division of Anatomical Pathology, National Health Laboratory Service, Charlotte Maxeke Johannesburg Academic Hospital, South Africa

Corresponding author, email: malinibhana@yahoo.com

Summary
Cannabis legalisation continues to grow globally and its effects on the vascular system have been scrutinized.1 Cannabis has become recognised as a contributor to cardiovascular, cerebrovascular and peripheral vascular disease.2,3 This case report highlights the case of a young male patient presenting with atypical symptoms following cannabis use who developed gangrenous cholecystitis (GC) following vasospasm of his cystic artery. We believe that this is the first-ever case, shared with the anticipation of stimulating more research and prompting recognition of vascular events in this group of patients as our knowledge on the effects of cannabis continues to grow.

Keywords: gangrenous cholecystitis, cannabinoids, vasospasm, illicit drugs, acalculous

Case report
A 26-year-old male presented to our emergency department complaining of abdominal pain and vomiting for three days. He was previously well, with no known comorbidities, HIV negative, and the only other significant history was cannabis use that had continued until the day that his symptoms began. He further admitted to daily cannabis use for the past 6 months. He had stable vitals on arrival with a blood pressure of 126/91 and a heart rate of 88 bpm. His abdomen was generally tender but soft with no guarding and all other systems were normal on examination. His X-rays revealed no abnormalities either and he was assessed as an acute gastritis, given a stat dose of a proton pump inhibitor and analgesia after which his symptoms improved. He was subsequently discharged with advice given to return if his symptoms recurred.

He returned to the emergency department the following day with worsening epigastric pain and intractable vomiting. He denied further cannabis or any other drug use. His vitals revealed a blood pressure (BP) of 100/62 and a heart rate (HR) of 78 bpm. His blood results were a white cell count (WCC) of 15.3 and c-reactive protein (CRP) of 181 with a lactate of 1 on an arterial blood gas. His abdomen was peritonitic and he was thus booked for an emergency explorative laparotomy.

Biliary peritonitis was found on opening with a gangrenous gallbladder, and a cholecystectomy was performed. He had distended bowel loops secondary to an ileus and his nasogastric tube drained 2.5 L during the procedure. The patient remained stable intraoperatively but aspirated upon

Figure 1a: Intraoperative view of gallbladder, 1b: Gallbladder specimen on removal
It is a well-recognised cause of peripheral vascular disease, and the pathogenesis is complex and is at least partly due to THC, which is proven to have a vasoconstrictor effect. It's effect on the hepatic blood supply and cystic artery are not well described.

A number of pathophysiological mechanisms have been proposed in cannabis use and vascular disease. Cannabis arteritis, vasospasm and platelet aggregation are the most widely recognised effects. The first report of cannabis arteritis was in 1960 by Sterne and Ducastaing. It is a recognised cause of peripheral vascular disease, and the pathogenesis is complex and is at least partly due to THC, which is proven to have a vasoconstrictor effect. Recent literature has also shown an association between chronic cannabis use and cerebrovascular events, with vasospasm and atherosclerosis as the purported mechanisms.

In the context of the GC, it is difficult to ascertain whether the vasculitis and thrombi observed within the gallbladder serosa as seen on this histological specimen represent a primary vasculitis or, alternatively, is a consequence of the GC and therefore a secondary vasculitis. However, as no mechanical cause was found for obstruction on opening the specimen, it is believed that primary pathology of the cystic artery has resulted in GC in this patient, and thus cannabis should be considered as a risk factor.

As cannabis legalisation continues to grow globally, we need to consider the treatment implications as the full significance and consequences of the drug's effects unfold. Its effects on the vascular and hepatobiliary system remain incompletely understood but it seems prudent to keep in mind and investigate its arterial manifestations with a high index of suspicion as a delay or missed diagnosis can have dire consequences and a high mortality.

**Conflict of interest**

The authors declare no conflict of interest.

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**Ethical approval**

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**ORCID**

M Bhana [ORCID: 0000-0001-6301-2234](https://orcid.org/0000-0001-6301-2234)
Y Perner [ORCID: 0000-0002-3569-6867](https://orcid.org/0000-0002-3569-6867)

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