Journal of Medical Case Reports

CASE REPORT Open Access

Penile self-amputation due to cannabis-induced psychosis: a case report

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Abstract

Background: In recent decades, cannabis has been widely used around the world for medical and recreational purposes, both legally and illegally. Aside from its therapeutic benefits, cannabis exhibits many adverse effects. Psychosis is one of the potentially harmful effects of cannabis.

Case presentation: A 23-year-old Thai man, who reported cannabis use for 2 years and discontinued for 3 months, restarted smoking two bongs (2 g equivalence) of cannabis. Two hours later, he had a penile erection, felt a severe persistent sharp pain in his penis, and reported that his glans looked distorted. Intending to eradicate the pain, he decided to trim the penile skin several times and completely amputated his penis himself using scissors. Cannabis-induced psychosis was diagnosed because symptoms began after cannabis use, without evidence of other substance abuse. To confirm the cannabis exposure, his urine immunoassay was positive for delta-9-tetrahydrocannabinol (Δ^9-THC). The distal penis was deemed too dirty and fragile for reconstruction. Bleeding was controlled, penile stump irrigated and debrided, and scrotal urethrostomy was performed by a urologist. After admission and cannabis discontinuation, his delusion and hallucination subsided.

Conclusions: Cannabis-induced psychosis is an adverse effect of cannabis, which may lead to impaired judgement unexpected self-harm. A multidisciplinary team approach, including a primary care physician, an emergency physician, a urologist, and a psychiatrist, is essential when dealing with a patient with cannabis-induced psychosis and a urogenital injury.

Keywords: Cannabis, Case report, Penile self-amputation, Psychosis, Self-mutilation

Background

In recent decades, cannabis, dried–grated flowers and leaves of *Cannabis sativa*, has been widely used for medical and recreational purposes [1]. Aside from its therapeutic benefits, cannabis exhibits many adverse effects, including impaired judgement. With heavy use, paranoia and psychosis may be expected [2, 3]. Male genital self-mutilation from psychiatric disorder or substance-induced psychosis have been reported, however, the exact prevalence of these conditions is unknown. Some reports state about hundred cases within the past two decades [4, 5]. However, self-amputation of penis in cannabis-induced psychosis has rarely been reported [6]. In this case report, we highlight a psychotic condition induced by recreational cannabis use, leading to penile self-amputation in a different manner.

Case presentation

A 23-year-old Thai man, who reported cannabis use for 2 years and discontinued for 3 months, restarted smoking two bongs (2 g equivalence) of cannabis. Besides cannabis, he reported drinking five cups of coffee per day. He denied depressed mood or manic symptoms, alcohol consumption, other substance abuse, or previous

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self-harm. He denied any underlying disease, previous psychiatric treatment, nor a family history of psychiatric condition. Two hours later, he had a penile erection without sexual stimulation, felt a severe persistent sharp pain in his penis, and reported that his glans looked distorted. Intending to eradicate the pain, without command hallucination, he decided to trim the penile skin several times and completely amputated his penis himself using scissors. He reported awareness throughout the process. After 2 hours, the bleeding had not stopped. He was brought to a primary care hospital, where he was given intravenous cloxacillin, tetanus prophylaxis, and referred to our emergency department. On arrival, he was hemodynamically stable and cooperative. There was active bleeding at the penile base and a 5-cm lacerated wound at the scrotum. The remaining penile stump was 2 cm in length with loss of the whole penile skin. The amputated distal part of the penis was contaminated with ants and had fragile dorsal veins (Fig. 1). Urine immunoassay was positive for delta-9-tetrahydrocannabinol (Δ^9-THC).

A urologist was consulted for surgical intervention. The distal penis was deemed too dirty and fragile for reconstruction. The patient was transferred to the operating theater for emergency surgery. Bleeding was controlled, the penile stump irrigated and debrided, and scrotal urethrostomy was performed. He was admitted to the surgical ward. A psychiatrist diagnosed the patient with substance-induced psychotic disorder. His mental status examinations found he had visual and auditory hallucinations, such as seeing moving shadows, hearing birds chirping or insects buzzing, depressed mood, and restricted affect. He was coherent and delusional, with no suicidal ideas. Supportive psychotherapy and 2 mg/day of risperidone were initiated. After admission and cannabis discontinuation, his delusions and hallucinations subsided. He stayed in the hospital for 14 days. The dosage of risperidone was adjusted to 6 mg/day at discharge. The brief psychiatric rating scale (BPRS) showed a score of 28 before treatment compared with a score of 18 after treatment. After 2 weeks, the patient was able to void in a sitting position, without wound infection. He denied visual or auditory hallucinations. Second stage penoplasty with a scrotal flap was planned, however, the patient was not available for follow-up and further management as he had relocated.

Discussion and conclusions

In this patient, the diagnosis of substance-induced psychotic disorder could be made as his symptoms began after cannabis use, without evidence of other substance abuse, and his urine immunoassay was positive for delta-9-tetrahydrocannabinol (Δ^9-THC), as well as from the resolution of psychotic symptoms within 4 weeks after abstinence [7]. To date, the 2019 Annual Report of the American Association of Poison Control Centers reported that patients using cannabinoids and analogues account for 0.8% of fatalities among all substance-exposed fatalities [8]. The Oregon/Alaska Poison Center also reported that routes of cannabis exposure were ingestion (73.9%), inhalation (22.5%), topical/parenteral/

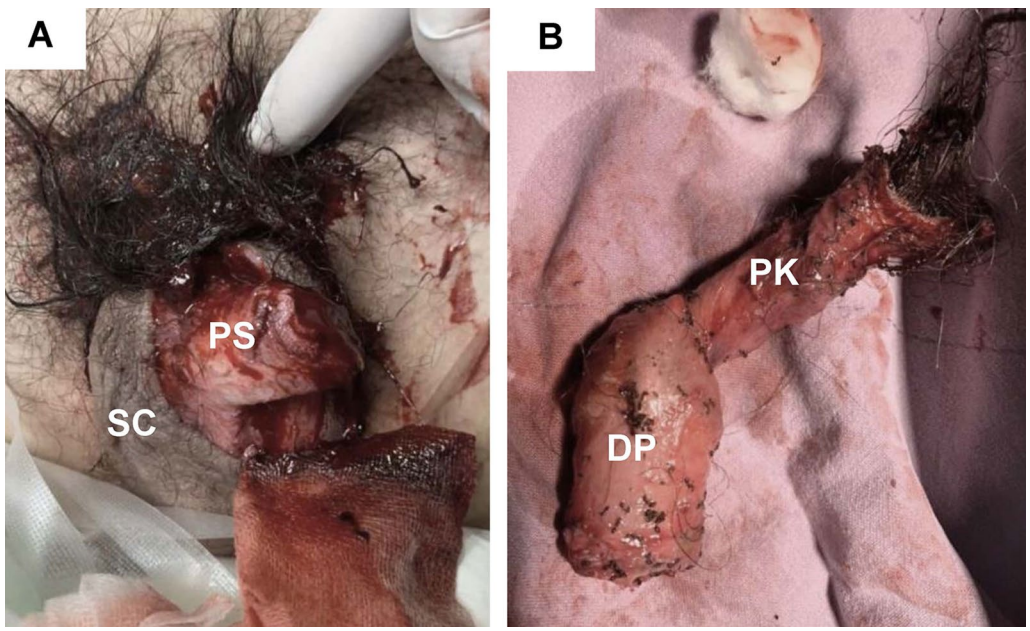

Fig. 1 **A** The remaining penile stump. **B** The amputated distal penis. *DP* amputated distal penis, *PS* penile stump, *PK* penile skin, *SC* scrotum

rectal (0.8%), and unknown/other (2.8%) between 2015 and 2017. Most of the patients were male, and two-thirds among the overall age group were intentional use [9].

Cannabis use was reported to increase the risk of psychosis, loss of insight, and thought disorder leading to unexpected behavior, including in patients with no previous psychiatric disorders, as seen in our patient [10–12]. The severity of psychosis depends on the amount of THC [13]. THC, consumed by smoking cannabis, is one of the primary cannabinoids producing psychoactive effects through the dopaminergic pathway [14]. Over time, the concentration of THC in illegal cannabis samples has increased from less than 4% to more than 12%, suggesting a need for stricter regulation as a higher THC concentration is associated with more adverse effects [2].

Self-amputation of the penis due to cannabis-induced psychosis, as in our patient, is a devastating event that interferes with the quality of life, such as urination dysfunction or sexual function. Although psychosis is a manifestation in cannabis users, the method of self-amputation of the penis in cannabis-induced psychosis varies. Khan *et al.* reported a case of self-amputation of the penis in a patient with cannabis-induced psychosis whose penis was chopped off by a sharp object [6]. On the other hand, in our patient, the penile skin was trimmed several times and then completely amputated using scissors. Several times of trimming rather than stopping after the first trimming indicated the calm self-harm and persistence due to psychosis. After self-amputation in our patient who denied previous personal hygiene neglect and antisocial behavior, the amputated distal part of the penis was contaminated with ants. Although self-neglect is a finding in some substances such as methamphetamine [15], we could not determine if discarding of the amputated part of his penis was related to a cannabinoid effect leading to self-neglect or his intention to eradicate the origin of pain at the penis.

From our patient's history of penile erection with persistent sharp pain, priapism could also be suspected in our patient. Priapism is a condition where the penis remains erect for at least 4 hours, without sexual stimulation [16]. However, our patient's condition did not fulfill priapism diagnostic criteria because the penis was cut off before the erection exceeded 4 hours. Sickle cell disease as a priapism risk factor is a rare disease in our patient population, and his blood investigations did not demonstrate anemia [17]. Although there are some previous case reports about cannabis use and priapism, the reported patients used cannabis combined with other substances. Evans *et al.* reported concurrent cannabis, steroid, and cocaine use in an insulin-dependent diabetes mellitus patient [18]. Tran *et al.* reported a patient with priapism after use cannabis and ecstasy. It could be the interaction between cannabis and ecstasy via ecstasy stimulating dopamine release in the brain. Synergistic interactions between ecstasy and cannabis might be possible [19]. In an animal model, dopamine receptor agonist increases central oxytocinergic neurotransmission and facilitates penile erection [20]. Therefore, cannabinoid use promoting dopaminergic pathway might play a role in penile erection [19]. Moreover, cannabinoids block the thoracolumbar sympathetic pathway, which could result in the penis being unable to detumescence and increasing the risk of priapism [17, 21]. THC interacts with a cannabinoid type 1 (CB1) receptor in the central nervous system (CNS), peripheral nervous system, and vasculature. Consequently, cannabinoids might potentiate vascular effects and lead to penile erection and priapism [17, 19]. Although SR 141716A is a CB1 receptor antagonist, it increases the glutamic acid and also activates the oxytocinergic neurons, leading to penile erection in the rat model [22]. Recently, a previous case report suggested a relationship between cannabis use alone and priapism. However, the patient smoked cannabis for the previous 6 months and no self-harm or psychosis occurred [17]. Although priapism is a painful event, self-amputation is rare in a patient with normal judgement. Thus, self-harm of our patient could be the effect of psychosis.

Acute cannabis exposure has been shown to have the following effects: CNS excitation (38.3%), CNS depression (24.4%), cardiac problems (14.6%), nausea and vomiting (9.5%), unusual/unexpected subjective sensation (strange, weird, bizarre) (3.6%), abdominal pain (2.4%), and psychosis (1.6%) [9]. Our patient also felt a severe persistent sharp pain in the penis after cannabis exposure. It might be an unusual/unexpected subjective sensation from the cannabis effect. However, we could not conclude that our patient's sharp pain was because of priapism or an unusual/unexpected subjective sensation from cannabis exposure.

In summary, cannabis-induced psychosis is an adverse effect of cannabis, which may lead to impaired judgement and unexpected self-harm. A multidisciplinary team approach, including a primary care physician, an emergency physician, a urologist, and a psychiatrist, is essential when dealing with a patient with cannabis-induced psychosis and a urogenital injury.

Abbreviations

BPRS: Brief psychiatric rating scale; CB1 receptor: Cannabinoid type 1 receptor; CNS: Central nervous system; ED: Emergency department; THC: Tetrahydrocannabinol.

Acknowledgements

Not applicable.

Authors' contributions
NJ, SB, and JV contributed to treatment decisions. NJ, SB, JV, and TT contributed to data collection and writing the manuscript. All authors read and approved the final manuscript.

Funding
The authors declare that no funding was received for this study.

Availability of data and materials
Data sharing is not applicable to this article as no datasets were generated or analysed during the current study.

Declarations

Ethics approval and consent to participate
The research ethics committee board approval of the Faculty of Medicine, Chiang Mai University was obtained (certificate of exemption number: 7413/2020). Written informed consent to participate was obtained from this patient.

Consent for publication
Written informed consent was obtained from the patient for the publication of this case report and accompanying images. A copy of the written consent is available for review from the Editor-in-Chief of this journal.

Competing interests
The authors declare that they have no competing interests.

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Received: 14 October 2020 Accepted: 11 January 2022
Published online: 30 January 2022

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