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Case Report

Ketamine-associated Ulcerative Cystitis

*Yung-Chien Huang[1], Chin-Ming Jeng[2], Tzu-Chieh Cheng[2]**

[1]*Department of Medical Imaging, Min-Sheng General Hospital, Taoyuan, Taiwan*
[2]*Department of Radiology, Cathay General Hospital, Taipei, Taiwan*

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Abstract

Well documented side effects of ketamine include altered mental status, and cardiovascular and respiratory toxicities. A new clinical entity termed ketamine-associated ulcerative cystitis characterized by irritative lower urinary tract symptoms has been reported recently. We report a case of ketamine-associated ulcerative cystitis in a 25-year-old man. He suffered progressive, painful hematuria, dysuria and suprapubic pain several days after beginning ketamine abuse. His symptoms aggravated over the next 6 months and imaging studies confirmed a contractile urinary bladder with bilateral hydronephrosis and hydroureter. Although there was partial relief of his symptoms after cessation of ketamine abuse, he now requires regular hemodialysis for end-stage renal disease. (*Tzu Chi Med J* 2008;20(2): 144–146)

*Corresponding author. Department of Radiology, Cathay General Hospital, 280, Section 4, Jen-Ai Road, Taipei, Taiwan.
E-mail address: tcuarnium@yahoo.com.tw

1. Introduction

Ketamine, a derivative of phencyclidine hydrochloride, interferes with excitatory amino acids including glutamate and aspartate. It is a noncompetitive N-methyl-D-aspartate receptor antagonist introduced in the 1960s as a dissociative anesthetic (1–4). Ketamine also interacts with muscarinic, nicotinic, cholinergic and opioid receptors inhibiting the neuronal uptake of norepinephrine, dopamine and serotonin (2,4). Ketamine has been more widely used as a recreational drug in nightclubs, dance parties and "raves" since the 1980s, and its street names include special K, K, kit-kat, keets, super acid, super K, and jet (1–3,5–7). Reported side effects include altered mental status, and cardiovascular and respiratory toxicities (1–5).

A new clinical entity termed ketamine-associated ulcerative cystitis and characterized by irritative lower urinary tract symptoms related to ketamine use among young adults has been reported recently (1). The diagnosis is mainly based on ketamine-related symptoms involving a combination of irritative voiding symptoms, hematuria, suprapubic pain and erythematous bladder lesions (1,7). The reported mean age is 25, with a male dominance. Bilateral hydronephrosis was found in most cases (7). Although the mechanism of ketamine-associated ulcerative cystitis remains unclear, variable degrees of eosinophilic infiltrates noted in four reported cases with bladder biopsy results suggest a complement-related disorder (8). Thus, we report a case of ketamine-associated ulcerative cystitis because of the potential for under-diagnosis

and because of the growing incidence of ketamine abuse.

2. Case report

A 25-year-old man presented with painful hematuria, dysuria and suprapubic pain. He smoked half a pack of cigarettes per day and his history was unremarkable. Urine cultures, urinalysis and urine cytology were normal except for 20–30 red blood cells per high power field. The initial intravenous pyelography (IVP) showed no abnormal results. Cystoscopy revealed edematous mucosal changes (Fig. 1). The patient received conservative treatment with regular clinical follow-up.

His symptoms persisted and aggravated over the next 6 months. He revealed a previously concealed history of ketamine abuse. The drugs, which he bought in night clubs, were white powders which he dissolved in normal saline and took via intravenous injection about two to three times a week. His symptoms began just several days after the onset of ketamine use. His blood analysis was normal except for eosinophilia (4.1%). IVP showed a contracted urinary bladder, narrowing of bilateral cystoureteral junctions, bilateral hydroureters and bilateral hydronephrosis (Fig. 2). Computed tomography revealed a small urinary bladder with irregular wall thickening (Fig. 3). Partial relief of his symptoms was noted after cessation of ketamine use. However, after 3 months, the patient required regular hemodialysis due to end-stage renal disease.

3. Discussion

We reported a case of ketamine-associated ulcerative cystitis in our institution. This is a new clinical entity that has been identified recently and the diagnosis is mainly based on ketamine-related symptoms involving a combination of irritative voiding symptoms,

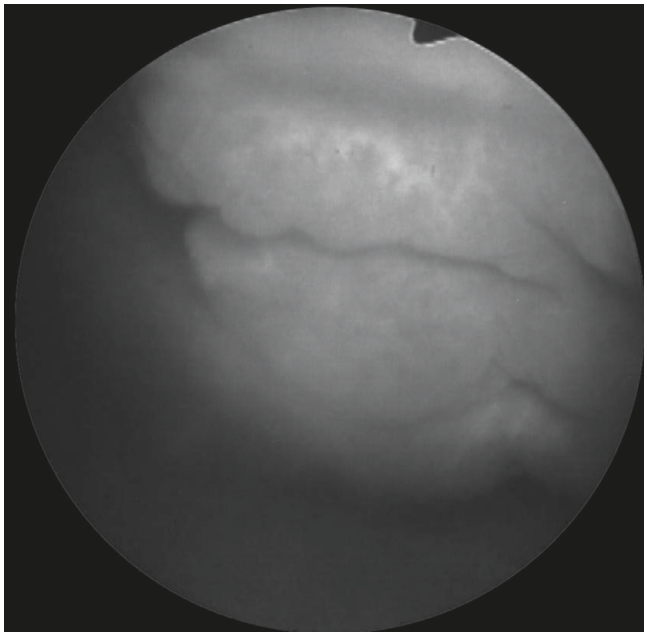

Fig. 1 — Cystography reveals nonspecific mucosal edematous changes in the urinary bladder.

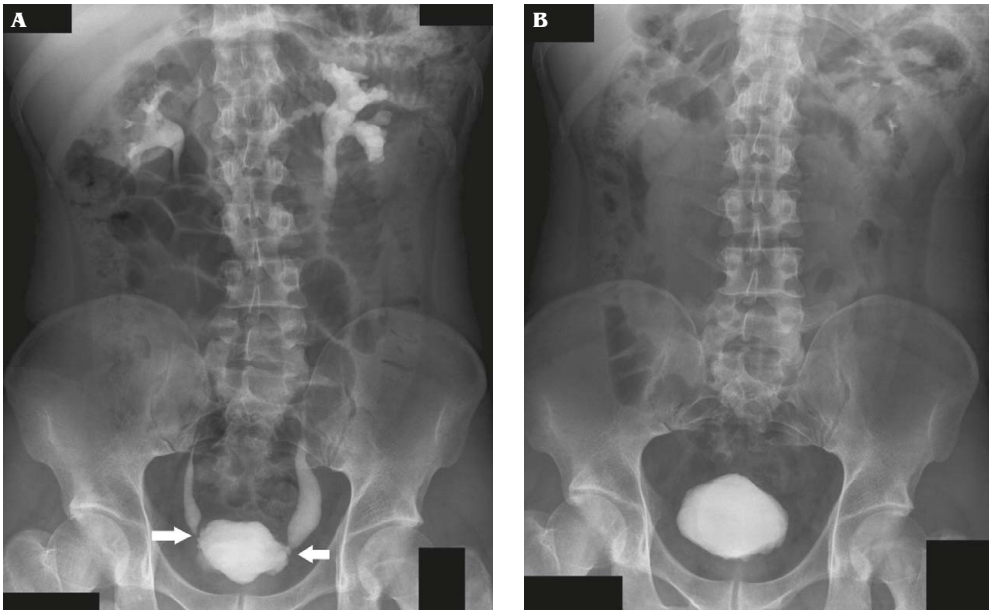

Fig. 2 — (A) Intravenous pyelography 6 months after initial presentation reveals a contracted urinary bladder, narrowing of bilateral cystoureteral junctions (arrows), bilateral hydroureters and bilateral hydronephrosis 40 minutes after contrast media injection. (B) Previous pyelography 6 months before reveals no abnormal findings.

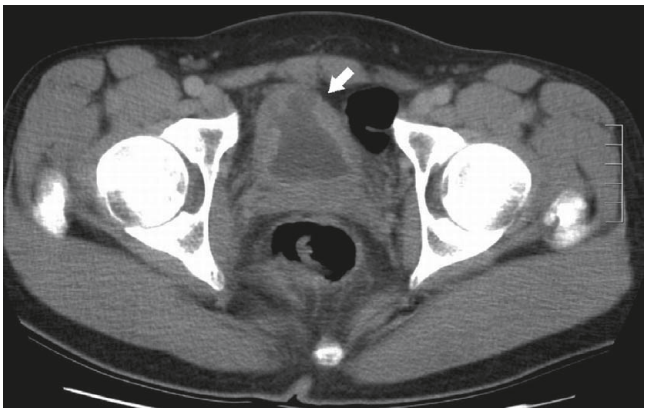

Fig. 3 — Non-enhanced transverse computed tomography reveals a reduced cavity and irregular wall thickening in the urinary bladder (arrow).

hematuria, suprapubic pain and erythematous bladder lesions [1,7]. The strong temporal association of painful hematuria, dysuria and suprapubic pain in our patient observed between the onset and cessation of ketamine use implicated the diagnosis. His cystographic and imaging findings also suggested the diagnosis.

Our patient was a 25-year-old man with bilateral hydronephrosis. Chu et al reported 10 patients with ketamine-associated ulcerative cystitis characterized by male dominance (70%) with a mean age of 25 years; bilateral hydronephrosis was noted in eight cases [7]. However, they reported abnormal elevation of alkaline phosphatase and alanine aminotransferase in all 10 cases, but this was not present in our patient. Shahani et al reported variable degrees of eosinophilic infiltrates in all of four cases with bladder biopsy [1]. Although a bladder biopsy was not performed, the eosinophilia in our patient may resemble this finding to some extent. Cystitis with eosinophilic infiltration on histology is termed eosinophilic cystitis and was first reported in 1960 by Brown and Palubinskas [1,8]. Eosinophilic cystitis shares a clinical presentation similar to ketamine-associated ulcerative cystitis and thus they may have a common mechanism of complement-related irritation of the uroepithelium.

Ketamine is clinically used as a short-acting, general anesthetic for pediatric anesthesia [1–7]. It has been more widely used as a recreational drug in nightclubs since the 1980s [1,3,5–7]. Well documented side effects include altered mental status, and cardiovascular and respiratory toxicities [1–5]. It is a commonly abused drug and at least 70% of emergency room visits for drug abuse in young adults have been attributed to ketamine abuse [2,7]. Thus, clinicians should be aware of these newly reported urinary side effects.

At the present time, the recommended treatment for ketamine-associated ulcerative cystitis includes cessation of ketamine use, possibly combined with administration of pentosan polysulfate [1]. However, as in our patient, symptoms in some cases may not completely resolve with cessation of ketamine use and chronic cystitis may occur [1,7]. Clinicians should be ready to manage this new clinical entity because of the potential for under-diagnosis and because of the growing incidence of ketamine abuse.

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