

# A Contracted Painful Bladder Related to Abuse of Ketamine — The Intravenous Urogram Presentation

Chih-Cheng Lu, M.D.\*

Division of Urology, Department of Surgery, Chi Mei Medical Center, Liouying, Tainan, Taiwan

\*Correspondence: Department of Medical Information Management, Chi Mei Medical Center, Liouying, 201, Taikang, Liouying District, Tainan, Taiwan  
E-mail: lu@ms6.hinet.net

## INTRODUCTION

Ketamine is an anesthetic drug; however, it is abused as an illicit recreational drug. Abuse of ketamine may result in significant complications including a small painful bladder, ureteral obstruction, papillary necrosis and hepatic dysfunction [1]. A man who was abusing ketamine and who had a painful bladder sequela is presented.

## CASE PRESENTATION AND CLINICAL COURSE

A 27 year-old man complained of frequent urination, even up to 20 times a day, and suprapubic pain that had lasted for weeks. At first, treatment by medication for urinary tract infection and an unstable bladder, based on urine routine and urine culture, resulted in a satisfactory and temporary alleviation. However, the above symptoms re-appeared on and off with the frequent urination bothering him the most. Before interstitial cystitis was suspected, the patient revealed that he had a history of habitual sniffing of ketamine as an illicit recreation, which had started about one year ago. His personal history included cigarette smoking of one pack-per-day for 6 years and social alcohol drinking. He declared he had not suffered from any urinary symptoms at all before the ketamine abuse began. Under the impression of a drug related unstable bladder condition, he received hydro-dilatation of the urinary bladder under general anesthesia as the treatment regimen. At the same time (0.9 mg/dL of serum creatinine), an intravenous urogram (IVU) was performed. Severe stricture or narrowing of the bilateral distal ureters, which was causing moderate obstructive uropathy together with an irregular urinary bladder wall with decreased capacity were noted (Fig. 1). Cystoscopy also demonstrated that the ureteral orifices had a horseshoe appearance (Fig. 2). The pathology of the bladder biopsy was consistent with hemorrhagic cystitis. Although the patient had stopped using ketamine, the distressful symptoms waxed and waned. His followup was irregular for personal and familial reasons.

## DISCUSSION

Ketamine is used as a short-acting general anesthetic may be applied during human or veterinary surgical procedures [1-3]. It is a very safe and useful drug when used in anesthetic practice under medical supervision [1]. However, significant unpleasant consequences happened with illicit misuse.

One question posed by the present case is whether ketamine it-

self is able to cause cystitis. Although it is reasonable to question whether it is ketamine itself or another concomitant illicit substance causes the urinary symptoms, one animal study does suggest a causal link [4]. Up to the present, there is little evidence to support the hypothesis that another concomitant illicit substance is responsible for the bladder damage [1]. However, synergistic bladder damage effects by another substance do remain possible and deserves further study.

The next question the needs to be posed is what mechanism induces or causes the bladder injury. The four possibilities for bladder injury by this drug are urinary tract direct toxin damage by ketamine, direct microvascular damage by ketamine and/or its metabolites, auto-



**Fig. 1.** Shrinkage of urinary bladder shown by intravenous urogram film.



**Fig. 2.** Horseshoe appearance of the right ureteral orifice by cystoscopy.

immune damage triggered by ketamine, or unrecognized bacteriuria [1].

Horseshoe appearance of the ureteral orifices under cystoscopy can act as an alert sign of vesico-ureteral reflux [5]. However, the patient did not suffer from flank pain and his serum creatinine was normal. In addition, there was no significant contrast retention detected on the plain abdominal X-ray film after IVU. The patient did not agree to undergo voiding cystourethrography to confirm this finding.

In the present case, the painful shrinking bladder causes the patient not only physical distress but also psychological distress. Antibiotic and/or steroid treatment seldom are able to control the symptoms related to ketamine induced ulcerative cystitis [2,3,5] and, up to the present, no successful treatment regimen for the results of ketamine abuse has been identified [1,2]. It is very important for the patient to stop abusing ketamine, but unfortunately the disease progression may not stop after the patient abstains from ketamine and the endpoint may even be end-stage renal failure [6]. Surgery (cystectomy/bladder reconstruction) is a possible solution, but not a first priority for most patients [1]. The sequelae of ketamine abuse need to be considered more and further studies are needed for this devastating disease.

### REFERENCES

1. Wood D, Cottrell A, Baker SC, et al: Recreational ketamine: From pleasure to pain. *BJU Int* 2011; **107**:1881-1884.
2. Lim EK, Lin VCH, Chang HC: Ketamine abuse associated with bilateral kidney hydronephrosis. *Incont Pelvic Floor Dysfunct* 2011; **5**:23-24.
3. Shahani R, Streutker C, Dickso B, Stewart RJ: Ketamine-associated ulcerative cystitis: A new clinical entity. *Urology* 2007; **69**:810-812.
4. Yeung LY, Rudd JA, Lam WP, Mak YT, Yew DT: Mice are prone to kidney pathology after prolonged ketamine addiction. *Toxicol Lett* 2009; **191**:275-278.
5. Chiang IN, Chang SJ, Yang SS, Hsieh CH: Ketamine abuse associated with vesicoureteral reflux. *Incont Pelvic Floor Dysfunct* 2010; **4**:57-58.
6. Huang YC, Jeng CM, Cheng TC: Ketamine-associated ulcerative cystitis. *Tzu Chi Med J* 2008; **20**:144-146.