

# Bottoms Up: Methamphetamine Toxicity from an Unusual Route

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Methamphetamine (MA) use is becoming commonplace, and emergency physicians (EPs) are seeing patients with abuse-associated complications. Previous reports have described inhalational and intravenous routes. We present the second case of rectal MA abuse in the literature. Trans-rectal use is important for EPs to consider because ongoing absorption of massive quantities may be averted upon detection. Additionally, trans-rectal abuse risks anorectal trauma and vascular necrosis with colonic perforation.

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## INTRODUCTION

Methamphetamine (MA) and chemically related compounds have become preeminent drugs of abuse. Internationally, MA use ranks second only to cannabis as the most commonly abused drug with 35 million users worldwide.<sup>1</sup> In Canada reports have documented increasing popularity in addition to concomitant morbidity.<sup>2-4</sup> A recent national survey estimates the lifetime incidence of any use to be 6% for all Canadians.<sup>5</sup> MA use in the United States (U.S.) is similarly common. The 2005 U.S. National Survey on Drug Use and Health reported 10.4 million (4.3%) Americans aged 12 or older had tried MA, while 1.3 million reported MA use in the last year and 512,000 in the past month.<sup>6</sup> The MA problem is socially costly due to violence associated with its use, economic non-productivity of abusers, and the harm to individuals near labs from highly toxic by-products of manufacture.<sup>7</sup> Emergency physicians (EPs) witness directly the tremendous impact on medical, trauma, and psychiatric care systems. One report estimates that 2.3% of emergency department (ED) visits are related to MA use.<sup>8,9</sup> According to another recent assessment, abusers of MA, compared to abusers of cocaine, are more likely to require admission to a psychiatric unit and to have longer stays.<sup>10</sup>

MA toxicity can occur via a variety of exposure routes. The most frequently cited forms are intranasal, oral, intravenous (IV), or inhaled.<sup>6</sup> We present a case report of a patient who developed toxicity following a unique method of exposure.

## CASE REPORT

A 30-year-old man was brought to the ED by paramedics from outside a gas station bathroom. Police had been called because the patient had been in the bathroom for an hour, and they had to forcibly open the door to release him. The patient admitted to taking a “large” amount of MA in addition to six beers. The patient reported racing thoughts and feeling anxious but denied chest pain, shortness of breath, nausea, vomiting, or suicidal ideation. The patient denied having any medical problems or medications.

The patient was awake and conversant, but also agitated and restless. His vital signs were pulse 145 beats per minute, blood pressure 145/ 77 mmHg, oral temperature 37.2°Celsius, respiratory rate at 22 breaths per minute, pulse oximetry 97% on room air and a normal blood glucose. His physical exam revealed 4mm mydriasis without nystagmus and minimal reaction to light. He had positive bowel sounds and was not diaphoretic. The rest of his lung, heart, and extremity exam was unremarkable. An ECG demonstrated a sinus tachycardia, with no ischemic changes and normal intervals. Initial laboratory tests included electrolytes, complete blood count, liver function tests, and cardiac markers, with the following abnormal results: creatinine 1.3 mg/dL, creatinine kinase 1779 IU/L and troponin I of 0.11 ng/mL. A urine and serum toxicology screening was positive only for MA and alcohol.

The patient became more manageable over a period of four hours and asked to use the restroom. Appearing improved, remorseful, and ambulatory, his request was

granted. He then disappeared for an hour and was later found in another part of the hospital in a decompensated state with tachycardia, agitation and altered mental status. The patient was restrained, sedated and admitted to the hospital. Tachycardia and agitation persisted despite over three liters of IV normal saline and almost 50 mg of IV lorazepam over the next 12 hours. Finally, the patient had a bowel movement productive of a tampon. In the morning, the patient's mental status had resolved. Upon further questioning, the patient admitted to inserting a MA-soaked tampon trans-rectally. The tampon was not tested for MA. He subsequently signed out against medical advice rather abruptly and further information regarding his past MA use could not be obtained.

## DISCUSSION

To our knowledge, we present the first report of a case of MA toxicity after intentional rectal administration with a tampon. Awareness of this novel usage is important for EPs as prolonged exposure to MA can potentially be avoided by specific questioning and careful physical exam.

Routes of MA administration are varied, with prior reports of exposure via nasal insufflation, IV administration, ingestion of liquid formulations, and a single case report of intravaginal exposure.<sup>11</sup> Our report of MA toxicity demonstrates a novel delivery method – intentional rectal administration with a tampon. The rectal bioavailability of MA is not well-defined, but enteric absorption via the oral route is good with relatively low protein binding (<20%). The volume of distribution is approximately 4L/kg.<sup>12</sup> Similar to the oral route, absorption of MA across rectal mucosa may provide significant quantities of MA to be delivered rapidly into the systemic circulation via the anorectal-venous circulation. Though the literature lacks data regarding relative speed of onset via different routes, a popular website dedicated to MA subculture reports the following times for various routes: oral (20-30 minutes); intranasal (3-5 minutes); smoking (7-10 seconds); trans-rectal (3-5 minutes); and IV (15-30 seconds).<sup>13</sup>

Complications of intestinal absorption to MA have been reported primarily in the context of both body packers and stuffers. Body packers, often referred to as “mules,” swallow packets (such as condoms) containing large quantities of drugs as a transport method with the expectation of subsequently defecating the packets intact. Body stuffers, on the other hand, swallow drugs to avoid capture while in possession of drugs. The former group experiences toxicity when transport vehicles fail and inadvertently release drugs into the gastrointestinal tract. The latter group absorbs drugs as a result of haphazard packaging and rapid consumption of the drug. The occurrence of ischemic bowel after systemically administered cocaine or ergotamine use, secondary to mesenteric vasoconstriction, is well documented. There have also been at least four case reports of ischemic bowel after MA use.<sup>14</sup> The application of methamphetamine directly to rectal mucosa likely has local

vasoconstrictive effects, making rectal ischemia and necrosis a potential complication.

A recognized problem with rectal administration is leakage of the mixture after dosing; this is discussed on websites dedicated to the MA use subculture.<sup>15</sup> Presumably, the tampon used by this patient was intended to prevent such leakage. Our patient seemed to experience delayed and possibly recurrent toxicity from this route of administration, possibly due to a delayed-release effect of using a tampon.

Cantrell et al.<sup>16</sup> have recently reported a similar case of a woman who suffered toxicity following transrectal MA use. However, their patient experienced a more acute onset and resolution of symptoms consistent with direct instillation of liquid solution. Additional information and case reports of these types of exposures may help clarify whether the time-course and complications of anorectal exposure to MA are distinct from other routes of exposure.

## CONCLUSION

Use of MA will likely increase, requiring EPs to manage multiple patients with sympatho-mimetic toxidromes, some of them severe. Epidemiologic data suggest that MA use will not wane like PCP and LSD. The users of this drug are inventive, and almost no method or route of administration goes untested. As this case highlights, the EP should specifically question patients about the route of administration, and perhaps include a rectal exam for patients suspected of MA toxicity, or at least those with recurrent or prolonged intoxication.

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*Conflicts of Interest:* By the WestJEM article submission agreement, all authors are required to disclose all affiliations, funding sources, and financial or management relationships that could be perceived as potential sources of bias. The authors disclosed none.

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