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Case Reports

Upper Extremity Soft Tissue Wound Related to Xylazine-laced Fentanyl Intravenous (IV) Drug Abuse: A Case Report

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A 35-year-old male abusing intravenous (IV) xylazine-laced fentanyl presented with bilateral forearm wounds. His wounds extended from the wrist to the proximal forearm with exposed muscles and tendons. He was treated with intravenous antibiotics, multiple surgical debridements, and negative pressure wound therapy. He left against medical advice (AMA) and returned with similar, smaller wounds nine months later. The patient was treated and again left AMA and has not followed up since. Xylazine is a veterinary tranquilizer often added to fentanyl to prolong and enhance its effects, whose presence has markedly increased in the illicit drug markets in the United States. It can result in extensive tissue loss from direct toxicity of the drug and/or concomitant infection. Xylazine use may increase morbidity in persons who inject drugs relating to the high prevalence of skin ulcers, soft tissue abscesses, and risk of serious infection necessitating surgical management.

Level of Evidence

Level 4

INTRODUCTION

Xylazine, also known as “tranq” or “tranq dope,” is a non-opioid veterinary tranquilizer that has been increasingly reported in the illicit drug supply of the United States (U.S.). It is often combined with fentanyl or other opioids to prolong and enhance their euphoric effects and delay the time to withdrawal.[1] When taken with opioids, the risk of fatal overdose may increase. The benefit of the life-saving intervention naloxone is diminished as it cannot reverse the effects of xylazine alone.[2] Overdose mortality in the current U.S. opioid crisis is known to be closely linked with the rise of synthetic opioids, such as fentanyl, and polysubstance abuse. Xylazine-laced fentanyl has been implicated in an increasing number of overdose deaths nationwide.[1] This is evidenced by the 2019 report from the Centers for Disease Control and Prevention (CDC) revealing the presence of xylazine in postmortem toxicology samples from drug overdose deaths in 25 of the 38 states examined.[3]

Xylazine is a direct alpha-2 adrenergic receptor agonist that causes CNS depression, muscle relaxation, analgesia, and sedation. Thought to have partial alpha-1-adrenergic agonist activity,[4] xylazine causes direct vasoconstriction of peripheral blood vessels and decreased skin perfusion, leading to necrosis.[4,5] These effects mediate the frequent occurrence of abscesses and skin ulceration among persons who inject drugs (PWID) known to contain xylazine.[1,6] Xylazine can have both an anesthetic and sedative effect, thus promoting further injection into the site of painful skin ulcerations and worsening the clinical condition of PWID. Additionally, the extent of soft tissue destruction and poor wound vascularity limit reconstructive options. In mild to moderate cases, reconstructive options include debridement, skin grafting, and flap coverage. In the most severe cases, amputation may be the definitive treatment.[7]

CASE REPORT

A 35-year-old male presented to the emergency department with bilateral forearm wounds. His past medical history was significant for untreated hepatitis C. He was unemployed and homeless. He reported injecting xylazine-laced

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Figure 1. Examination image of the left forearm wound showing extensive undulated regions of necrosis and eschar.

fentanyl into his bilateral forearms. A physical exam revealed bilateral full-thickness skin wounds from the wrist to the proximal forearm over the ulnar border measuring **[Figure 1]**. The wounds appeared cavernous with undulated regions of eschar. Further, examination revealed exposed muscle and tendon bilaterally and some exposed muscle of the dorsal forearm compartments. His hand function was preserved.

The patient was admitted to the hospitalist and initiated on broad antibiotic treatment with intravenous vancomycin and piperacillin/tazobactam. His wounds were washed and covered at the bedside, and he underwent surgical debridement in the operating room the following day. Intraoperatively, the eschar layers were removed sharply with a knife until a bleeding surface was encountered. Exposed muscle layers were removed with a curette. The ulna had an intact periosteum. Large-volume irrigation was used to clean the wounds. A negative pressure wound therapy device was fitted to the bilateral forearms. The sponge was changed twice over six days. On a postoperative day seven, the patient was returned to the operating room. Granulation tissue was observed over the ulna, and the wounds appeared clean. The surgeon covered the area with a split-thickness skin graft taken from the thigh. A negative pressure wound dressing was placed over the skin graft. The patient left the hospital against medical advice (AMA) two days following the second surgery and did not follow up in the surgeon's office.

Approximately nine months later, the patient returned to the emergency room with a similar, smaller wound on the left forearm. On exam, both previous skin grafts had healed well, and the new wound was adjacent to the volar border of the skin graft and measured 8x4cm. The wound exhibited a cavernous appearance but did not have exposed muscle. The next day, surgical debridement was performed, followed by negative pressure wound therapy. The day after surgery, the patient left AMA with no follow-up reported since.

DISCUSSION

Xylazine has been increasingly detected in opioid-related overdose deaths, with the highest prevalence in the U.S. observed in Philadelphia (25.8%).[1] Higher injection rates, compared to other routes of administration, have been identified among those who tested positive for xylazine, increasing the risk for painful skin ulcers.[5] Currently, testing for xylazine is very limited, and no rapid testing method exists to detect xylazine within the drug supply or shortly after consumption.[8] Rapid testing would vastly improve directed efforts to prevent, diagnose, and manage affected patients. Thus, we face a clear barrier to management that significantly hinders attempts at implementing harm reduction or novel treatment strategies.[8]

The dorsum of the hand and forearm are common sites for injection. Tissue loss from the direct toxicity of the drug and/or concurrent infection may result in broad defects of the skin and muscle necrosis, compromising tendons and leading to exposure of subcutaneous bones such as the ulna or metacarpals. Hand function and range of motion are often poor, even in forearm wounds with intact skin over the hand, likely due to chronic swelling, contracture, infection, and impaired lymphatic drainage.

Wound care is often difficult due to the extensive care required in patients frequently lacking medical and social support systems. Large, exposed wounds routinely require multiple procedures, complex surgeries, lengthy hospital stays, and high costs.[9] Patient support systems, addiction severity, and self-efficacy may strongly influence the ability to salvage the limb.[4]

Currently, there is no existing classification system or associated guidelines for the surgical management of xylazine-induced injuries. The descriptions below are drawn from our experience treating these injuries and existing literature for similar injury types.

MILD TO MODERATE WOUNDS

Mild to moderate wounds have partial to full-thickness skin defects and minor muscle necrosis. If volitional hand control is preserved, they may be treated with serial debridements, with or without split-thickness skin grafting.[10,11] Regional flaps or free flaps are limited by the size of the wound or the vascular status of the limb.[11]

SEVERE WOUNDS

Severe wounds have full-thickness skin defects with large regions of muscle necrosis. Underlying bones may be exposed, and osteomyelitis with or without structural bone loss may be present. The hand is often not functional, and amputation is usually required to prevent systemic sepsis.[12] When possible, reconstruction often involves bone grafts, free flaps, or regional flaps, depending on the individual situation.[11,13]

CONCLUSION

This case report illustrates the soft tissue consequences of intravenous drug use of fentanyl laced with xylazine. Further research is needed to understand the health implications of soft tissue infiltration of xylazine and its soft tissue management.

CONFLICT OF INTEREST

The authors do NOT have any potential conflicts of interest in the information and production of this manuscript.

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ETHICAL APPROVAL FOR STUDY

This study was determined to be exempt from IRB approval by the Thomas Jefferson University Institutional Review Board.

INFORMED CONSENT

The authors declare that there is no information in the manuscript that can be used to identify patients. The patient was informed that data concerning the case would be submitted for publication and provided consent.

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