

## Hypertrophic and atrophic scars

J. Christian Cather, MD, and Jennifer Clay Cather, MD

A middle-aged man presented with firm hypopigmented linear lesions and an ulcerative papule (Figure 1) as well as atrophic scars (Figure 2) on his forearm. *What is your diagnosis?*



**Figure 1.** Forearm with hypopigmented linear scar and hyperpigmented ulcerative papule.



**Figure 2.** Forearm with atrophic lesions.

**DIAGNOSIS:** Cutaneous manifestations of heroin use.

### DISCUSSION

Two recent reports by the US Department of Health and Human Services indicate recent trends in heroin use. The 2001 National Household Survey on Drug Abuse found that heroin incidence rates rose during the 1990s. There were 146,000 new heroin users in 2000 (1). Data from the Drug Abuse Warning Network (DAWN) report estimated that heroin was involved in 162,137 emergency department visits in 2004 (2). DAWN data also revealed that there were 4820 heroin-related deaths in the USA in 1999 (3). A recent nationwide survey demonstrated that 2.4% of students had used heroin one or more times during their lifetime (4). Recognizing the cutaneous manifestations of parenteral drug abuse may allow for early recognition, intervention, and rehabilitation for the otherwise recreational user (5).

### Types of manifestations

Cutaneous stigmata and other sequelae related to drug abuse are categorized as *direct* (primary) or *indirect* (secondary) (Table) (6). Direct sequelae most commonly result from the specific drug, the foreign body adulterants used to dilute (“cut”) the narcotic, or traumatic implantation of bacterial organisms and are either localized or systemic. The most common local direct manifestation of parenteral drug abuse is hyperpigmentation at the injection site, which is usually followed by hypertrophic scars (5). Injection of virtually any cutaneous or mucocutaneous area has been documented. One study that examined the pattern of addict-chosen injection sites found that the veins in the antecubital fossae are initially used; however, after 3 to 5 years, these veins become sclerosed and inaccessible (11). Other peripheral sites are then used for intravenous access, with the hands, neck, feet, legs, and dorsal vein of the penis having been described in the literature (7, 8). A patient has been described

From the Department of Psychiatry, The University of Texas Southwestern Medical Center, Dallas, Texas (J. Christian Cather), and the Division of Dermatology, Department of Internal Medicine, Baylor University Medical Center, Dallas, Texas (Jennifer C. Cather).

**Corresponding author:** Jennifer Clay Cather, MD, Modern Dermatology, 9101 N. Central Expressway, Suite 150, Dallas, Texas 75231 (e-mail: jennifercather@mac.com).

who attempted venipuncture 50 times per day trying to find a patent vessel (9).

Difficulties obtaining intravenous access lead to subcutaneous/intracutaneous injection (“skin popping”) with resultant ulcerations (“heroin ulcers”) and atrophic scars. These marks are not reversible and should raise suspicion of illicit drug use (6). Microscopic examination of injection site biopsy specimens frequently demonstrates giant palisading granulomas with central crystalline material (starch, talc, and other foreign material used to “cut” addictive drugs) (8).

Direct systemic effects include fixed drug reaction and pruritus (6).

Sequelae indirectly related to the drug habit can be divided into psychogenic stigmata (neurotic excoriations, wrist scars from suicide attempts, etc.) and medical problems. Two common indirect medical problems associated with parenteral drug abuse are hepatitis C (HCV) and HIV. A 2004 study that examined 199 intravenous drug users from high-risk locations (“shooting galleries”) in inner-city Miami, Florida, found that 36% were infected with HCV only, 8% were infected with HIV only, and 31% were infected with both HCV and HIV (12).

### Treatment

Treatment varies greatly and is dictated by the patient’s symptoms. Cutaneous scarring requires no intervention but should alert providers to the possibility of heroin use or dependence. Referral to an addiction specialist or a rehabilitation facility would be appropriate.

Most rehabilitation strategies for heroin dependence include detoxification, which reduces the symptoms of opioid withdrawal. By reducing the physical dependence on the drug, a setting is created for recovery from the psychological dependence. A variety of detoxification strategies have been described. Methadone, an oral opioid with a long half-life, is the most commonly used agent (13). Other agents that are commonly used to reduce withdrawal symptoms include buprenorphine and clonidine (13).

Following detoxification, various inpatient and outpatient rehabilitation strategies have been described. These can be roughly classified into two broad categories: abstinence oriented (“getting clean”) and agonist maintenance (harm reduction) (14). Narcotics Anonymous ([www.na.org](http://www.na.org)) offers a 12-step program that provides group support and education for patients in recovery. This recovery method stresses abstinence and has been found to be an effective relapse prevention method (15). When abstinence fails, maintenance therapy can be an effective strategy. In maintenance therapy, an illegal, dangerous street drug (heroin) is replaced with a legal, controlled opiate (methadone, buprenorphine) in a setting that also frequently provides counseling and psychosocial support (16).

### Acknowledgments

Special thanks to John Talmadge, MD, and Cemal Unverdi, MD, for their assistance with this manuscript.

**Table. Physical manifestations of parenteral drug abuse\***

Relation to drug use	Type of manifestation	Examples		
Direct	Localized	Skin tracts (Figure 1)		
		Pop scars (Figure 2)		
		Ulceration and/or bullae		
		Infections (abscess, cellulitis, bullous impetigo)		
		Sphaceloderma (gangrene of the skin from necrotizing angitis)		
		Lymphangitis and lymphadenitis (hand edema)		
		Thrombophlebitis		
		Camptodactylia (irreversible contracture of fingers)		
		Traumatic tattoo (carbon implanted after needle is flamed)		
		Perforated septum		
Direct	Systemic	Contact dermatitis		
		Cigarette burns		
		Fixed drug eruption		
		Urticaria (injection site reaction vs generalized)		
		Pruritus		
		Pulmonary (pulmonary edema, cor pulmonale, talc granulomatosis of the lung)		
		Indirect	Psychogenic	Excoriations (neurotic or acne excoriée)
				Suicide/depression/anxiety
				Child abuse
		Indirect	Medical	Necrotizing angitis
Serum sickness–like reaction				
Infections (endocarditis, hepatitis, tetanus, sepsis, syphilis, HIV)				
Pseudoacanthosis nigricans				
Poor dentition				
		Cognitive changes		

\*From references 5–10.

1. Substance Abuse and Mental Health Services Administration, Office of Applied Studies. *Results from the 2001 National Household Survey on Drug Abuse: Volume I. Summary of National Findings* (NHSDA Series H-17, DHHS Publication No. SMA 02-3758). Rockville, MD: SAMHSA, 2002:83.
2. Substance Abuse and Mental Health Services Administration, Office of Applied Studies. *Drug Abuse Warning Network, 2004: National Estimates of Drug-Related Emergency Department Visits* (DAWN Series D-28, DHHS Publication No. SMA 06-4143). Rockville, MD: SAMHSA, 2006:80.
3. Sporer KA. Strategies for preventing heroin overdose. *BMJ* 2003; 326(7386):442–444.
4. Eaton DK, Kann L, Kinchen S, Ross J, Hawkins J, Harris WA, Lowry R, McManus T, Chyen D, Shanklin S, Lim C, Grunbaum JA, Wechsler H. Youth risk behavior surveillance—United States, 2005. *MMWR Surveill Summ* 2006;55(5):1–108.
5. Weidman AI, Fellner MJ. Cutaneous manifestations of heroin and other addictive drugs. Study and analysis. *NY State J Med* 1971;71(22):2643–2646.
6. Young AW Jr, Sweeney EW. Cutaneous clues to heroin addiction. *Am Fam Physician* 1973;7(2):79–87.
7. Del Giudice P. Cutaneous complications of intravenous drug abuse. *Br J Dermatol* 2004;150(1):1–10.

8. Rosen VJ. Cutaneous manifestations of drug abuse by parenteral injections. *Am J Dermatopathol* 1985;7(1):79–83.
9. Young AW Jr, Rosenberg FR. Cutaneous stigmata of heroin addiction. *Arch Dermatol* 1971;104(1):80–86.
10. Davies RD, Thurstone C, Woyewodzic K. Substance use disorders and neurologic illness. *Curr Treat Options Neurol* 2004;6(5):421–432.
11. Darke S, Ross J, Kaye S. Physical injecting sites among injecting drug users in Sydney, Australia. *Drug Alcohol Depend* 2001;62(1):77–82.
12. McCoy CB, Metsch LR, Collado-Mesa F, Arheart KL, Messiah SE, Katz D, Shapshak P. The prevalence of human immunodeficiency virus type 1 and hepatitis C virus among injection drug users who use high risk inner-city locales in Miami, Florida. *Mem Inst Oswaldo Cruz* 2004;99(8):789–793.
13. Gitlow S. *Substance Use Disorders: A Practical Guide*. Philadelphia: Lippincott Williams & Wilkins, 2001.
14. Peterson J, Mitchell SG, Hong Y, Agar M, Latkin C. Getting clean and harm reduction: adversarial or complementary issues for injection drug users. *Cad Saude Publica* 2006;22(4):733–740.
15. Witbrodt J, Kaskutas LA. Does diagnosis matter? Differential effects of 12-step participation and social networks on abstinence. *Am J Drug Alcohol Abuse* 2005;31(4):685–707.
16. Van den Brink W, Haasen C. Evidenced-based treatment of opioid-dependent patients. *Can J Psychiatry* 2006;51(10):635–646.