

## CASE REPORT

# Fatality due to unusual femoral vein rupture in an injectable drug user

Abhishek Yadav, Aravindan V, Abilash S, Sudhir K Gupta

Department of Forensic Medicine and Toxicology, All India Institute of Medical sciences, New Delhi, India

### Abstract

Drug addiction is an ever-increasing evil in society. Injectable drug users have a high risk of complications. There is a wide variety of presentations and complications of such addiction cases. Deaths are reported in drug users most frequently due to acute intoxication/overdose and related complications. Intravenous drug intake leading to rupture of a vein is seldom reported in the literature. We report a rare case in which a drug addict collapsed after a burst of drug kit following injection into his right thigh and died. The authors aim to highlight and spread awareness in society about such unknown uncommon accidental dangers associated with injectable drug abuse which could be fatal. The authors also aim to aid to Medical Literature such rare episodic occurrences which could cause fatality in drug users.

### Keywords

Femoral vein rupture; Hemorrhagic shock; Drug abuse; Injectable Drugs user; Substance abuse; Drug Kit.

### Introduction

Addiction involves compulsive seeking and use despite adverse reactions and is commonly chronic and relapsing.<sup>1</sup> Commonly abused drugs in India are cannabis, heroin, and Indian-produced pharmaceutical drugs. Cannabis products such as ganja, charas, or bhong are abused because of religious associations.<sup>2</sup> About 275 million people have used an illicit drug at least once in 2016, and drug use disorders are present in about 31 million people.<sup>3</sup> There are different modes of drug intake, such as inhalational, oral, and injectable methods.<sup>4</sup> Injection drug users (IDUs) face difficulty in sustaining venous access.<sup>5</sup> Accessing central veins are always the last option for such people.<sup>6</sup> Specifically, femoral vein access is seldom seen among IDUs and even if occurred probably at a later stage.<sup>7,8</sup> Although there is a wide variety in presentations and complications of such addiction cases, intravenous drug intake leading to rupture of a vein is seldom reported in the literature. Hence, we report a rare case in which a drug addict collapsed after a burst of drug kit following injection into his right thigh and died. The authors aim to highlight and spread awareness in society about such unknown uncommon accidental dangers associated with injectable drug abuse which could be fatal. The authors also aim to aid to Medical Literature such rare episodic occurrences which could cause Fatality in drug users.

### Case history

The deceased was a 36 years old male, allegedly a vagabond and a drug addict living in a night shelter He collapsed after a burst of drug kit following injection into his right thigh. He was taken to the Safdarjung Hospital in New Delhi where he was declared brought dead after initial resuscitation. The police searched for the relatives of the deceased but couldn't find them. Then Body was subjected to Medicolegal Autopsy after 12 days of death in All India Institute of Medical Sciences, New Delhi. A counselor who had been working for the past four years in the night shelter informed the police that the deceased was a chronic drug addict and used injectable drugs. The deceased reportedly had discomfort in his right thigh, the day before his death. He was admitted to the hospital but he ran away from there in the night. The next day i.e. day of his death, at around 6 pm, he was injecting himself in the thigh region when his 'KIT' got burst and he started bleeding from the thigh. An ambulance was called and he was taken to hospital, where he was declared brought dead.

### Autopsy findings

The deceased was average-built and moderately nourished. The length of the body was 172 cm. Clothes were intact. Rigor Mortis was passed off. Postmortem lividity was present over back and dependent parts of the body in the supine position. Both conjunctivae were pale. Oral mucosa was pale. Dried blood stains are present over the lower abdomen and right thigh (Figure 1). No significant finding was present in natural orifices. Multiple superficial ulcers of sizes varying from 0.5 cm x 0.5 cm to 1 cm x 1 cm are present on the medial side of both knees and both legs surrounded by blackish discoloration (Figure 2). An ulcerated sinus of size 2 cm x 2 cm x 4 cm was present in the right upper thigh, 6 cm below the anterior

### Corresponding Author

Dr. Abhishek Yadav (Additional Professor)  
E-Mail: drayad\_in@yahoo.com  
Mobile: +91-9818052523

### Article History

Received: 9<sup>th</sup> December, 2020; Revision received on: 5<sup>th</sup> August, 2021  
Accepted: 15<sup>th</sup> August, 2021

superior iliac spine with raised edges and with blood clots in the sinus (Figure 3). The Sinus had internal connection up to femoral vein to facilitate easy access of the vein from outside. On right thigh dissection, femoral vein rupture with surrounding hematoma was present (Figure 4). The femoral artery was intact. No other external injury was present over the body.

The brain and other internal organs were intact and congested. The neck region was devoid of any internal injury, fracture, or hemorrhage. Pleural cavities were obliterated on both sides. Both lungs were adherent to the chest wall and Multiple pus pockets were present. The heart weighed 312 gm. Both coronaries along their main branches were patent. Heart walls, valves, and chambers were normal. There were no features suggestive of air embolism or infective endocarditis. The stomach was empty with no appreciable smell. The cause of death was concluded as Hemorrhagic shock consequent upon femoral vein rupture.



Figure 1: Dried blood stains are present over the lower abdomen and right thigh



Figure 2: Superficial ulcers over the medial side of the right knee



Figure 3: External opening of an ulcerated sinus present in the right upper thigh

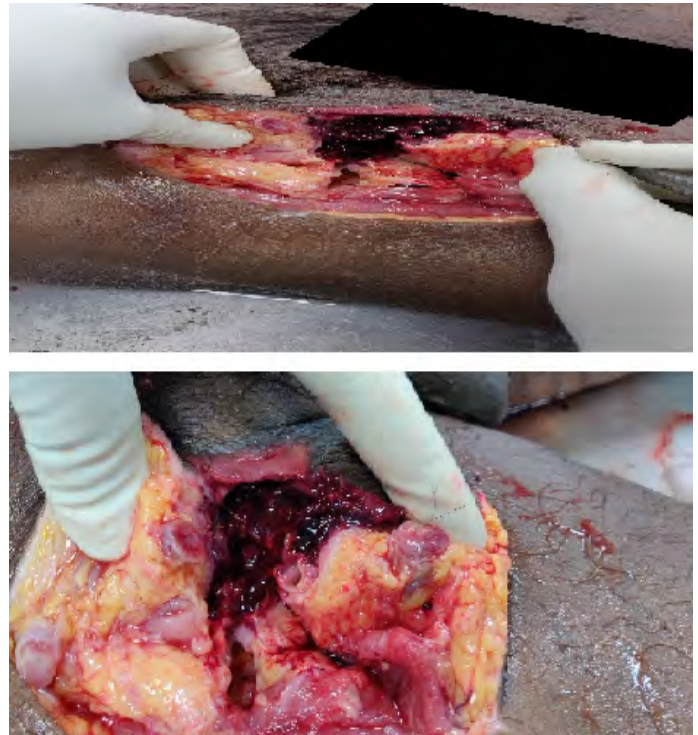


Figure 4: Right femoral vein rupture with surrounding hematoma

## Discussion

Drug addiction is a common problem in India. In Uttar Pradesh, Dube and Handa reported that 22.8 per 1000 were dependent on alcohol and drugs while Thacore from Lucknow reported the same as 18.55 per 1000. Alcohol was the most common substance to be used (60-98%), followed by cannabis use (4-20%).<sup>9,10</sup> Although our case is a chronic IV drug addict, IV drug abuse in India is relatively less. Western literature shows a common trend of IV drug abuse and literature pertaining specifically to femoral vein drug abuse is also available. Coffin PO et al. did a study on "Prevalence and Characteristics of Femoral Injection among Seattle-Area Injection Drug Users". The study was done to evaluate the prevalence and consequences of this practice. It was a cross-sectional survey. The study was done among 100-lifetime injectors. More than half of the study group chose the femoral vein because of its easy access. Femoral vein usage also created significant complications among them such as pain, infection, swelling, arterial or nerve injury, and endocarditis.<sup>11</sup> Medical complications of IV drug abuse include deep vein thrombosis (DVT), pulmonary embolism, chronic venous disease (CVD), septic thrombophlebitis, abscess, damage to femoral nerve, and compromise to the adjacent femoral artery with a consequent risk of gangrene are reported.<sup>11,12</sup>

Drug abuse can create 'Track marks' which are formed because

of sclerosis of underlying veins and post-inflammatory hyperpigmentation at the site of injection.<sup>13</sup> Multiple superficial ulcers were present in our case that correlate with these track marks. The non-dominant arm could be affected commonly, especially the antecubital fossa due to its hideable nature. On the contrary, IDUs also choose neck and leg veins which can be seen.<sup>14</sup> The choice of veins was more concealed in this case even though he was not living with family. 'Skin popping' is a method used by chronic IDUs, where circular, deep, punched-out looking scars are formed for access. These scars could be atrophic, hypertrophic, or keloid.<sup>15</sup> Formation of the hypertrophic ulcerated sinus in our case could be due to a similar reason. Chronic Venous Insufficiency (CVI) is one other complication seen among IDUs.<sup>14</sup> CVI could be due to repeated needle pricks resulting in thrombophlebitis. This can also affect lymphatic drainage causing chronic edema of the lower limbs.<sup>16</sup> Some cases also have shown ulcers in unusual sites such as tongue and digits. In such cases, the clinicians must be well equipped to identify and consider IV drug abuse as a differential diagnosis.<sup>17</sup>

Vascular injury and bacterial infection can cause pseudoaneurysm and mycotic aneurysm, respectively. They manifest as pulsatile masses. Some aneurysms are not pulsatile, which could be confused with abscesses. This can lead to bad outcomes if incised due to misdiagnosis.<sup>18</sup> The common site for a mycotic aneurysm is the femoral artery and commonly are caused due to *Staphylococcus aureus*.<sup>19</sup> The ulcerated sinus found in our case can be often confused with an aneurysm. Isolated venous injuries are less reported in the literature. Isolated femoral vein injuries are reported even less. Such Isolated femoral vein rupture is encountered in cases of bull horn injury, blunt trauma, iatrogenic and catheterization procedures.<sup>20,21,22,23</sup> The deceased in our case collapsed after the bursting of a drug kit, (a common term used by drug addicts for tools used for injection of drugs), which transmitted the force to femoral vein causing rupture of femoral vein and hence hemorrhagic shock leading to death. Many drugs are used for IV abuse. IV Cocaine can cause ulcers in the skin, especially in fingers, and infarction of the liver and kidney.<sup>24</sup> IV Heroin is available as a white powder and black tar heroin. White powder heroin is pure and can be snorted or injected. Black tar heroin is impure can be used as IV or IM after dissolving.<sup>25</sup> Senbanjo R et al. did a study in the UK between 2006 to 2009 on "Injecting drug use via femoral vein puncture: preliminary findings of a point-of-care ultrasound service for opioid-dependent groin injectors in treatment" where Ultrasonography (USG) was used for checking the status of health of femoral vein. Grading of femoral vein damage was done, and they concluded to establish more drug clinics where good injection practices are taught to prevent complications associated with it.<sup>26</sup>

## Conclusion

Complications of IV drug abuse should be understood well by general and dermatological practitioners. They can refer such patients timely to Medical/Psychiatry intervention to prevent further complications and a possible fatality. Ulcerated sinus formed due to chronic IV drug abuse should not be confused with aneurysms to avoid iatrogenic complications. IV drug abuse-related injury should be considered as one of the differentials in isolated venous rupture cases encountered during autopsies.

**Ethical clearance:** Not required

**Conflict of interest:** None to declare

**Source of funding:** None to declare

## References

1. Edition F. Diagnostic and statistical manual of mental disorders. Am Psychiatric Assoc. 2013; 21.
2. Srivastava A, Pal HR, Dwivedi SN, Pandey A. National household survey of drug abuse in India. Report submitted to the Indian Ministry of Social Justice and Empowerment and the United Nations Office for Drugs and Crime. 2003.
3. World Health Organization. Substance abuse. Facts and Figures [Internet]. 2016 [updated 2020 Jun 30; cited 2020 Jul 27]. Available from: [https://www.who.int/substance\\_abuse/facts/en/](https://www.who.int/substance_abuse/facts/en/).
4. Raiker N, Aouthmany M, Ezra N. Dermatologic signs and symptoms of substance abuse. *J Clin Exp Dermatol Res*. 2016;7(3):337.
5. Kral AH, Bluthenthal RN, Erringer EA, Lorvick J, Edlin BR. Risk factors among IDUs who give injections to or receive injections from other drug users. *Addiction*. 1999;94(5):675-83.
6. Maggi P, Fullone M, Federico M, Angarano G, Pastore G, Regina G. Drug injection in jugular veins: a new risk factor for vascular diseases in HIV-infected patients? A case report. *Angiology*. 1995;46(11):1049-52.
7. Roszler MH, McCarroll KA, Donovan KR, Rashid T, Kling GA. The groin hit: complications of intravenous drug abuse. *Radiographics*. 1989;9(3):487-508.
8. Darke S, Kaye S, Ross J. Geographical injecting locations among injecting drug users in Sydney, Australia. *Addiction*. 2001;96(2):241-6.
9. Dube KC, Handa SK. Drug use in health and mental illness in an Indian population. *Br J Psychiatry*. 1971; 118(544):345-6.
10. Thacore VR. Drug abuse in India with special reference to Lucknow. *Indian J Psychiatry*. 1972; 14(3):257-61.
11. Coffin PO, Coffin LS, Murphy S, Jenkins LM, Golden MR. Prevalence and Characteristics of Femoral Injection among Seattle-Area Injection Drug Users. *J Urban Health*. 2012;89(2):365-72.
12. Cooke VA, Fletcher AK. Deep vein thrombosis among injecting drug users in Sheffield. *Emerg Med J*. 2006; 23:777-9.



13. Hennings C, Miller J. Illicit drugs: What dermatologists need to know. *J Am Acad Dermatol.* 2013;69(1):135-42.
14. Del Giudice P (2004) Cutaneous complications of intravenous drug abuse. *Br J Dermatol.* 2004;150(1):1-0.
15. Fink B, Landthaler M, Hafner C. Skin alterations due to illegal drug abuse. *J Dtsch Dermatol Ges.* 2011;9(8):633-9.
16. Pieper B, Kirsner RS, Templin TN, Birk TJ. Chronic venous disease and injection drug use. *Arch Intern Med.* 2007;167(16):1807.
17. Moser RH. Heroin addiction. *JAMA.* 1974;230(5):728-31.
18. Georgiadis GS, Bessias NC, Pavlidis PM, Pomoni M, Batakis N, Lazarides MK. Infected false aneurysms of the limbs secondary to chronic intravenous drug abuse: analysis of perioperative considerations and operative outcomes. *Surg today.* 2007;37(10):837-44.
19. Kocovski L, Butany J, Nair V. Femoral artery pseudoaneurysm due to *Candida albicans* in an injection drug user. *Cardiovasc Pathol.* 2014;23(1):50-3.
20. Göçer H, Başbuğ HS, Özışık K, Günerhan Y. An isolated femoral vein injury caused by bull horn. *EJCM.* 2018;6(1):27-31.
21. Abdullah TI, Donaldson LA. An unusual case of isolated injury of the femoral vein after blunt trauma. *Eur J Surg.* 2003;164(12):971-3.
22. Flis V. Reconstruction of venous outflow after inadvertent stripping of the femoral vein. *Eur. J Vasc Endovasc Surg.* 1995;10(2):253-5.
23. Al-Homrany M, Wali M, Abu-Eshy S, El-Tawail M, Al-Taher AM. Fatal complication of percutaneous femoral vein catheterization in a hemodialysis patient. *Saudi J Kidney Dis Transpl.* 1999;10(1):59.
24. Kumar PD, Smith HR. Cocaine-related vasculitis causing upper limb peripheral vascular disease. *Ann Intern Med.* 2000;133(11):923-4.
25. Mars SG, Bourgois P, Karandinos G, Montero F, Ciccarone D. The textures of heroin: User perspectives on “black tar” and powder heroin in two U.S. cities. *J Psychoactive Drugs.* 2016;48(4):270-8.
26. Senbanjo R, Tipping T, Hunt N, Strang J. Injecting drug use via femoral vein puncture: preliminary findings of a point-of-care ultrasound service for opioid-dependent groin injectors in treatment. *Harm Reduct J.* 2012 Dec;9(1):6.