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#### Correspondence

Bipin Poudel  
MBBS Student, School of  
Medicine, Patan Academy of  
Health Sciences, Lalitpur, Nepal  
Email: bipinpoudel@pahs.edu.np

#### Peer Reviewers

Prof. Dr. Jay N Shah, Patan  
Academy of Health Sciences,  
Nepal

Asst. Prof. Dr. Pawan Sharma,  
Patan Academy of Health  
Sciences, Nepal

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## Groin hit death due to femoral vein rupture in a drug abuser

Kashev Shrestha<sup>1</sup>, Bipin Poudel<sup>2</sup> ✉, Pradeep Ghimire, Aastha Parajuli

<sup>1</sup>Lecturer, Dept. of Forensic Medicine; <sup>2</sup>MBBS Student, <sup>3</sup>Medical Officer, Patan Hospital, Patan Academy of Health Sciences, Lalitpur, Kathmandu, Nepal;

<sup>4</sup>Medical Officer, Helping Hands Hospital, Kathmandu, Nepal

### Abstract

Recreational drug use has become an imminent social and health problem throughout the world. Intravenous injection for drug misuse has been described in both the upper and lower limbs and is a major cause of millions of deaths each year; deaths are primarily due to fatal overdose and the trauma and infection caused by repeated injections. This paper presents an accidental death due to massive blood loss, which resulted from rupture to the right femoral vessel based on autopsy findings. In case of accidental injuries, a thorough medico-legal process, including death scene investigation, autopsy examination and toxicological analyses, are always necessary to determine the manner of death.

**Keywords:** Drug abuse, femoral vein rupture, groin hit

## Introduction

Drug addiction is a chronic disease characterized by drug seeking and compulsive use, or difficult to control, despite harmful consequences. Drug abuse has resulted into its addiction and in turn HIV/AIDS, hepatitis B, and other sexually transmitted diseases (STDs) incidence escalate.<sup>1</sup>

Despite the fact that injectable drugs are now used less frequently than inhalational agents, the types of substance abuse have shifted from cannabis to synthetic opiates and sedative-hypnotics, and the mode of administration has also shifted from inhalation to ingesting and injecting.<sup>1</sup> As peripheral veins become sclerosed by repeated injections, the intravenous drug abusers tend to shoot in the arteries and larger veins, particularly in the groin ("groin hit").<sup>2</sup> The common complications of this pattern of injections include ulceration, cellulitis, scarring, abscess formation, acute or chronic deep venous thrombosis, infected thrombi in the vein and artery, venous gangrene, arteriovenous fistula, arterial embolization, infective endocarditis, hepatitis, deformity, cardiac failure, hepatic failure and pseudoaneurysm formation.<sup>3-5</sup>

We describe an accidental death due to rapid, severe blood loss resulting from an intravenous injection of the drug that damaged the femoral vessels.

## Case Report

An adult male of 28 years was brought to the department of forensic medicine, Patan Academy of Health Science, for autopsy on 16 Oct 2019 and autopsy was conducted on the same day. Requisition letter from police stated that the deceased was found in an unconscious state in his home and was immediately taken to a tertiary hospital, where he died during treatment.

The hospital's emergency notes stated that the patient was unconscious, no pulses were palpable, blood pressure and respiratory rate was not recordable, no breath sound or heart

sound was heard and bilateral pupil were fixed and dilated, and ECG was flat. However, the death certificate was issued from the hospital, which states that the cause of death was hemorrhagic shock.

The family gave a history that the deceased used to take medications and he had not left his house for three weeks before the incident. At the scene of the incident, there was pool of blood present in the room where the deceased was found in an unconscious state.

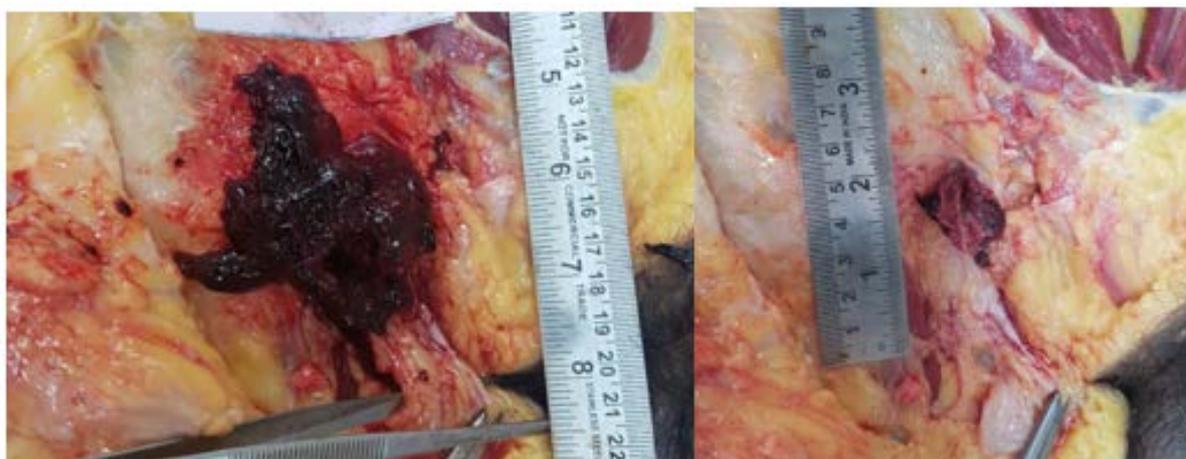
## Post Mortem Examination

External examination: The body was that of an adult male. Dried blood stains were present over lower abdomen and right thigh. An ulcerated sinus with blood clot measuring 4 cm x 2 cm was present over the right upper thigh, located 30 cm from the knee and 10 cm from the anterior superior iliac spine. Multiple purplish-black superficial ulcers, more than 10 in numbers ranging from a few mm to 5 cm x 4 cm, present over an area measuring 18 cm x 12 cm were present over the lower 2/3<sup>rd</sup> of the left leg.



**Figure 1. Photograph showing ulcer over right inguinal region with blood clots underneath**

Internal examination: Brain and other internal organs were pale. Dissection of right thigh revealed femoral vein rupture with surrounding hematoma. The femoral artery was intact. Rest of the findings was unremarkable.



**Figure 2. Inguinal region after dissection, with blood clots around femoral vein. Second figure after removal of surrounding blood clots**

### Discussion

The use of drugs worldwide is a tragic reality, and Nepal is no exception to this fact. A study done in Nepal on 2014, shows that more than 90 percent of the total drug addicts in Nepal have started using drugs before the age of 16.<sup>6</sup> Drug addiction has various complications, which can range from physical to psychological. These complications can be severe enough to cause the death of the individuals. One of the studies showed that most patients admitted to hospital with a history of Intravenous drug abuse die from a cause other than overdose, which includes complications like HIV and chronic alcoholism.<sup>5</sup> Apart from drug addiction and HIV/AIDS, hepatitis B, and other sexually transmitted diseases (STDs) are also on the rise. Among 60 thousand drug abusers, the number of IDUs is estimated to be 20 thousand. Sixty-eight per cent of these IDUs are HIV positive, and most of them are multidrug abusers. A study using the logistic regression analysis including occupation, motivating factors for drug use, ever been to custody, age at first drug use, age at first sex, money spent on drugs, ever been rehabilitated and age of the respondents showed a statistically significant association with injecting drug use status.<sup>6</sup> Injecting drug users, respondents initiating substance use early in life, using substances many times in a day and using both licit and illicit substances are at greater risk of having more significant psychosocial problems.<sup>9</sup> A

study provides the evidence of relapse who starts using drugs at the age of 15 to 35 years, they were relapsed 100 per cent. It is observed that the mean age for the first drug use was 17.04 years, and the data clearly shows that relapse is associated with age group and is statistically significant.<sup>7</sup>

Among the vascular complications, cases of fatal hemorrhages are mostly due to rupture of pseudoaneurysm of the femoral artery<sup>7</sup> and rarely due to pseudoaneurysm of the brachial artery.<sup>8</sup> Pseudoaneurysm is formed due to repeated trauma to the arterial wall resulting in disruption and hematoma formation, which is contained by surrounding tissue.<sup>4</sup> The femoral vein is a common site for injecting IV drug by drug abusers, however after repeated injections the veins become sclerosed and the IV drug abuser then tends to inject drugs in the arteries, which result in the formation of pseudoaneurysm.<sup>8</sup>

In the present case, the femoral artery was intact; however, the source of bleeding was identified as the femoral vein during the autopsy, which is a rare source of fatal hemorrhage especially in IV drug abusers, because repeated injection usually results in sclerosis of the veins which will further stiffen the venous wall.<sup>8</sup> If undetected in time, Vascular complication can result in rupture of such vessels with subsequent profuse bleeding and death, as has happened in this case. Such deaths are preventable if appropriate

measures were taken to stop drug addiction or people were made aware of such complications.

## Conclusion

Users of injectable drugs run the risk of serious consequences. Such addiction instances come in a wide range of appearances and problems. The most common causes of drug users' deaths are acute intoxication/overdose and its consequences. However, we have described a rare instance in which a drug user died after his femoral vein ruptured.

The authors want to draw attention to and raise awareness in society about fatal unintended risks connected with injectable drug misuse. The authors also want to add such uncommon event to medical literature. As proper knowledge about the consequences of drug abuse and complications associated with it could have prevented the fatal complications in this case. Hence, a multi-directional approach is required involving law enforcement agencies, de-addiction centers, and National level programs from the Health Ministry to prevent and reduce drug abuse in Nepal.

## Author Contribution

Concept, design, planning: KS; Literature review: BP; Data collection: KS; Data analysis: KS; Draft manuscript: BP; Revision of draft: PG; Final manuscript: AP; Accountability of the work: KS, BP, PG, AP.

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