

Kasuistik – Casuistry

Rupture of a Subclavian Artery Aneurysm in a Heroin Addict

Report of a Case

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Summary. A previously healthy heroin addict died suddenly and unexpectedly of hemothorax due to rupture of a subclavian artery aneurysm. He had been using the neck veins for mainlining. The pathogenesis of the aneurysm is discussed.

Key words: Heroin Addict, Rupture of a Subclavian Artery Aneurysm – Aneurysm, Rupture in a Heroin Addict

Zusammenfassung. Ein sonst gesunder Heroinabhängiger verstarb plötzlich und unerwartet an einem Hämorthorax als Folge einer Aneurysmaruptur der Arteria subclavia. Die Halsvenen waren zur Drogeninjektion benutzt worden. Die Pathogenese des Aneurysma wird diskutiert.

Schlüsselwörter: Heroininjektionen, in Halsvene – Subclavia aneurysma, Entstehung und Ruptur

Various complications of intravenous drug abuse are well known. Among these, subacute bacterial endocarditis and hepatitis are probably the most common. [1] Heroin-associated rhabdomyolysis has also been described [2], and, more recently, a case of Horner syndrome, caused by damage to the sympathetic fibers in the neck as a result of percutaneous heroin injection, has been reported [3]. The following case describes a heretofore unreported fatal complication of heroin mainlining.

Case Report

A 33-year-old black male was found unresponsive in a chair. He had complained of chest pain earlier in the day. Relatives stated that he had gone to the bathroom, then sat in the living room. A short time thereafter he was presumed to be sleeping until a friend failed to rouse him. The family knew of no medical history. Because of the unexplained and sudden nature of this death, it was reported to the Medical Examiner's Office.



Fig. 1. Addict with needle tracks in the neck due to intravenous drug injections. The scars are frequently indistinguishable from scars due to other causes

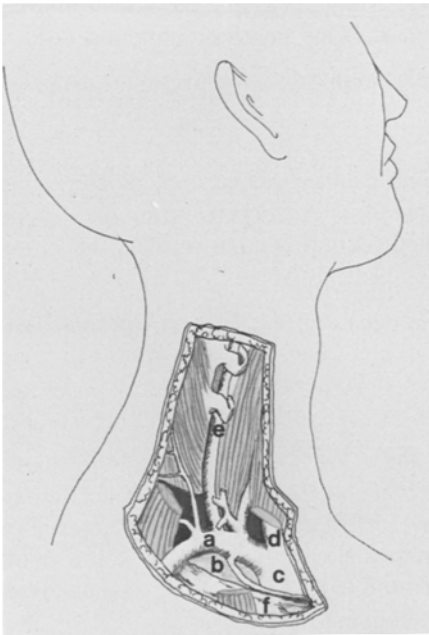


Fig. 2. Diagram of supraclavicular area showing the relationship of the subclavian artery to the parietal pleura.

- a* Subclavian artery (the letter *a* is located at the site of the center of the aneurysm.)
- b* Pleural dome
- c* Innominate artery
- d* Common carotid artery
- e* Vertebral artery
- f* First rib

At postmortem examination, there was no external evidence of injury noted except for multiple scarred needle tracks on the backs of both hands and the left forearm. Scars apparently due to needle punctures were observed on both sides of the neck (Fig. 1).

At autopsy there were recent needle punctures in the right external jugular vein. The wall of the vessel was extensively scarred, as was the surrounding soft tissue. The right subclavian artery had an aneurysmal dilatation which was approximately the size of an egg (4.5 cm in diameter). The lower aspect of the sac was perforated and

communicated with the pleural cavity on the same side, which contained 2000cc of partly clotted blood. A diagram showing the anatomic structures and relationships of the area in question is shown in Figure 2.

Microscopic examination of the scarred tissue from the perivascular area above the right clavicle showed the presence of multiple foreign body granulomas containing irregular, birefractile crystals. These are believed to be crystals of silicate (talc), frequently used by drug pushers to cut heroin. Toxicological analysis revealed a blood morphine level of 4 mcg% (heroin is metabolized to morphine in the liver).

Discussion

Heroin addicts are well known for their ingenious use of blood vessels for mainlining drugs. While the veins of the arm bends are the usual choice for injection, these veins, after prolonged use, become scarred and collapsed, causing the addict to search for other vessels or resort to skin-popping. Hands, the webs between the fingers and toes, the frenulum of the tongue and the penile shaft are all known to be areas used for intravenous injection; some of these sites are more commonly selected than others.

The neck is a frequent site for drug injection; however, the subclavian artery has, to the best of our knowledge, not been described before as being aneurysmal and to rupture as a result of percutaneous heroin injection. The major cause of subclavian artery aneurysm is direct, blunt trauma [4]. An arteriovenous fistula as a precursor to the development of a subclavian aneurysm cannot be excluded. Such a communication between the artery and vein could have developed as a result of penetration by the hypodermic needle or due to a chronic, low-grade inflammatory process in the area. The latter is known to occur quite often at intravenous injection sites of narcotic addicts due to the lack of sterility of the injectable substances and the equipment which they use. Spontaneous rupture of the subclavian artery in the Ehlers-Danlos syndrome could be excluded in this case because of the absence of both anatomic and microscopic evidence of this condition.

The lack of any pre-existing medical history, as well as the chest pains and suddenness of demise, would have suggested a coronary artery occlusion or hypertensive heart disease and stroke, especially considering the tendency toward these two conditions in the middle-aged black male. Awareness of scars over cutaneous veins, regardless of the body region, is often helpful in recognizing a heroin addict. The necessity for a complete postmortem examination and toxicological work-up in all cases of death in suspected drug addicts is indicated. Without careful study and documentation of all aspects of death by narcotic addiction, the magnitude and complexity of the problem of heroin abuse cannot be properly evaluated.

References

1. Baden, Michael: Investigation of deaths from drug abuse. In: Spitz, W. U. and Fisher, R. S. (Eds.) *Medicolegal Investigation of Death*, pp. 485–509 Springfield: Thomas, 1973
2. Schwartzfarb, L., Singh, G., Marcus, D.: Heroin-associated rhabdomyolysis with cardiac involvement. *Arch. Int. Med.* 137, 1255–1257 (1977)
3. Hawkins, K. A., Bruckstein, A. H., Guthrie, T. C.: Percutaneous heroin injection causing Horner syndrome. *JAMA*, 237, 1963–1964 (1977)
4. Rich, N. M., Hobson, R. W., Jarstfer, B. S. et al: Subclavian artery trauma. *J. Trauma*, 13, 485–496, (1973)

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