Letter to the Editor

Received: August 2, 1996

Accepted: August 23, 1996

Cardiology 1997;88:486

A Man in the Thunderstorm: Coronary Injuries and Electric Shock

F.	Fabrizio	Vianello
----	----------	----------

Department of Semeiotics, University of Padua, Italy

Fabrizio Vianello, Fourth Chair of Medicine, Department of Semeiotics, University of Padua, I-35100 Padua (Italy)

Dear Sir,

Myocardial injuries represent a common feature of electric shock. Cardiovascular effects of electrical injury include immediate cardiac arrest, acute myocardial necrosis, myocardial ischemia without necrosis, dys-rhythmias, hemorrhagic pericarditis, acute hypertension with peripheral vasospasm and asymptomatic nonspecific ECG abnormalities [1]. Although coronary spasm may occur with electrical injuries, occlusive thrombi of the coronary arteries have not been demonstrated in case of myocardial necrosis. We present a case where there are pieces of evidence proving that electric shock might cause thrombosis of the coronary arteries.

A previously healthy 32-year-old man was disconnecting a central plug during a thunderstorm when he received a short-duration hand-to-hand electric shock probably due to a lightning which stroke the main power cable. After 4 days, the patient came to our hospital complaining of an early morning retrosternal pain and upper left limb paresthesia. On admission, ECG, specific enzymes and echocardiogram did not show any abnormality. He reported no family history of heart disease or lipid disorder; a routine blood test showed only mild hypertriglyceridemia. On the following days, he had recurrences of mild thoracic pain with normal ECG and laboratory findings. A duplex Doppler examination of the carotid arteries showed only minimal (< 20%) traces of atheroma on the left external carotid artery. After 2 weeks, the patient complained of a strong retrosternal pain with an ST depression on ECG finding. He was transferred to the intensive coronary care unit where a coronary arteriography was immediately performed. A 90% eccentric occlusion of the descending anterior artery was observed, and after transluminal angioplasty only 10% occlusion was left.

Our case suggests that electrical injury might cause coronary occlusive thrombi. Coronary artery spasm represents the more advocated mechanism leading to cardiac ischemia in the course of electrical injury [2]; however, vascular injury has long been recognized as an important component of the effects of electrocution by production of focal degeneration of the smooth muscle in the tunica media of the heart, kidney and brain arteries [3]. The temporal correlation of the symptoms, the angiographic findings and the young age of our patient indicate a strong correlation between the electric shock and the coronary thrombosis. We suppose that the electric stimulus provoked the thrombus formation by vascular damage, perhaps on a

preexisting minimal size atheroma, leading to coronary artery obstruction. In the light of our case, in patients with electrical injuries we recommend to consider even thrombus formation as a possible cause of myocardial damage.

References

Carleton SC: Cardiac problems associated with electrical injury. *Cardiol Clin* 1995; 13:263-266.

Xenopoulos N, Movahed A, Hudson P, Reeves WC: Myocardial injury in electrocution. *Am Heart J* 1991;122:1481-1484. James TN, Riddick LR, Embry JH: Cardiac abnormalities demonstrated post-mortem in four cases of accidental electrocution and their potential significance relative to nonfatal electrical injuries of the heart. *Am Heart J* 1990; 120:143-157.

kaiuier

E-Mail karger@karger.ch Fax + 41 61 306 12 34

<http://www.karger.ch>

© 1997 S. Karger AG, Basel 0008-6312/97/0885-0486\$12.00/0

This article is also accessible online at: <http://BioMedNet.com/karger>