

Congestion bleeding of the head and neck following myocardial infarction

Caroline Mahon, Paul Maurice, Dougal McClean

Abstract

We present an unusual case of congestion bleeding of the head and neck following myocardial infarction. A 51-year-old man presented with widespread facial petechiae and subconjunctival haemorrhages following a collapse associated with evolving electrocardiographic changes. Emergency coronary artery stent placement was undertaken. No cardiopulmonary resuscitation (CPR) was performed.

We hypothesise that the presence of facial petechiae in our case following transient loss of consciousness due to a presumed ventricular arrhythmia in the setting of acute myocardial ischaemia, may have been precipitated by a Valsalva manoeuvre on regaining consciousness with sudden acute increase in venous pressure and consequent venous congestion of the head and neck, and that congestion bleeding of the face may occur in acute cardiac events without a history of CPR.

In clinical medicine petechiae of the head and neck and subconjunctival haemorrhage are common examination findings in cases in which there is a history of recurrent vomiting or forceful coughing.

Subconjunctival haemorrhage and petechiae of the face and neck are also the hallmarks of asphyxial death, particularly in cases of strangulation. The proposed pathophysiologic mechanisms for head and neck congestion bleeding are the combined effects of increased cephalic venous pressure generated by raised intrathoracic pressure or external compression of the neck or chest wall and subsequent hypoxic injury to the vascular endothelium of the skin and conjunctival microvasculature.

Congestion bleeding of the head and neck observed in patients experiencing non-traumatic near death events has long been thought to be a consequence of CPR, though this presumed association has been challenged in the forensic literature. We present the case of a patient with acute myocardial infarction presenting with head and neck congestion bleeding, without an antecedent history of CPR.

Case report

A 51-year-old man with a background of hyperlipidaemia treated with bezafibrate presented to the emergency department having had a collapse with loss of consciousness at his home. There was a preceding 3-day history of chest pain. The patient reported on the day of the collapse that he felt hot and complained of chest pain.

He was witnessed by his son to collapse to ground and was unresponsive, pale and sweaty. His son noted the appearance of a rash over the face and neck. The patient

took an estimated one minute to regain consciousness and then continued to complain of chest pain.

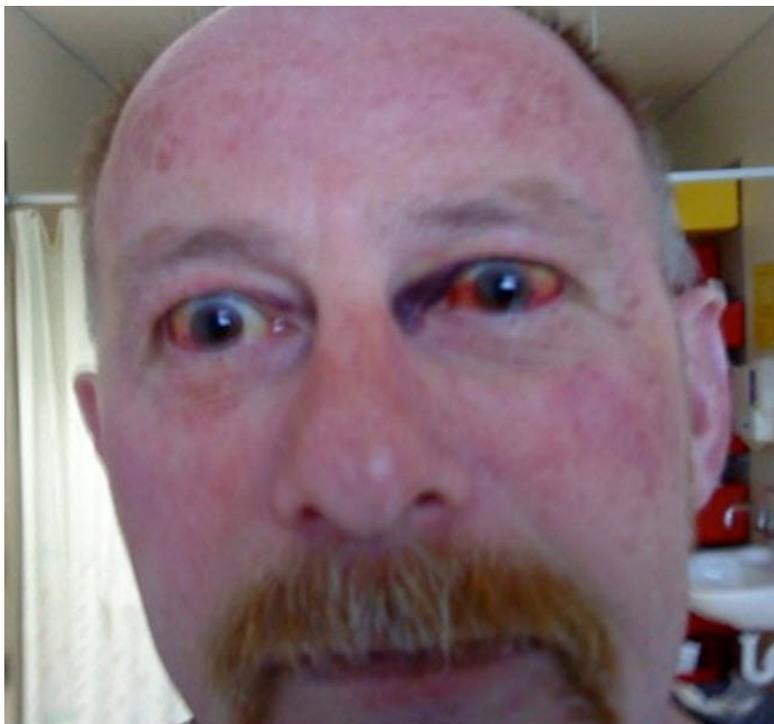
Ambulance staff noted on arrival at his home that the patient was alert and that his face was deeply flushed in appearance. His vital signs were within normal limits and he was in sinus rhythm. On arrival in the emergency department triage staff also documented the presence of a rash over the face and neck.

An ECG showed an evolving acute anterior ST elevation myocardial infarction and the patient went on to have urgent percutaneous coronary intervention, with placement of a single stent into the left anterior descending coronary artery and three stents into the right coronary artery.

He was given aspirin and clopidogrel immediately prior to the procedure, which was uncomplicated. A single intracoronary bolus of IIb/IIIa platelet inhibitor, abciximab was also given. An echocardiogram performed at the same time showed mildly impaired systolic function with an ejection fraction of 50%. There was no evidence of venous obstruction. Further comment was made of the presence of facial rash in the clinical record by the attending nursing staff at the time of the procedure.

The following morning the patient was noted to have widespread petechiae of the face and neck with bilateral subconjunctival haemorrhages. The platelet count, and INR/APTT were within the normal range. The dermatology service was asked to see him 60 hours after his admission.

Figure 1. The patient captured his image on his own cellphone the day after his presentation to hospital



On examination, extensive petechiae were seen over the face and neck, most prominent over the forehead and cheeks. There was bilateral subconjunctival haemorrhage, more pronounced on the left, with a left-sided upper eyelid ecchymosis in the region of the inner canthus (Figure 1).

Specific questioning of the patient and his relatives confirmed that CPR had not been performed in the community by family members or by ambulance staff.

Discussion

The clinical findings of facial petechiae, ecchymosis and subconjunctival haemorrhage in our patient are consistent with those typically seen in clinical medicine in cases of raised cephalic venous pressure induced by preceding prolonged or repeated Valsalva manoeuvre. There have been case reports of facial petechiae in cases of recurrent forceful vomiting¹ healthy newborn infants^{2,3}, infants with pyloric stenosis,^{3,4} as well as in weightlifters,⁵ bungee jumpers⁶ and as a rare complication of upper gastrointestinal endoscopy.^{7,8} Postictal facial petechiae have also been reported.^{9,10,11}

Facial petechiae have also been reported as post mortem findings in cases of death due to cardiac causes. The petechiae have long been thought to be related to venous congestion of the head and neck due to CPR attempts or iatrogenic post mortem handling of the corpse. However, periorbital and conjunctival petechiae have also been documented in post mortem findings in 21% of cases of cardiac death in which no resuscitative attempts were made.¹²

In a recent prospective study of 196 patients presenting to an emergency department in cardiac arrest due to non-traumatic causes (including myocardial infarction, arrhythmia, pulmonary oedema, pulmonary embolism and cerebral infarction), 4% were found to have periorbital and/or conjunctival petechiae before CPR was initiated.

Two survivors diagnosed with decompensated cardiac insufficiency, without petechiae at initial presentation or immediately after CPR, were found to have facial petechial haemorrhages hours after admission to an intensive care unit for management of ongoing cardiac insufficiency.¹³ Therefore, establishing a direct causative relationship between congestion bleeding of the head and neck and CPR in acute cardiac events is somewhat controversial.

It has been postulated that the appearance of congestion bleeding of the head and neck in survivors of cardiac events in which no CPR has been performed may be due to a period of acute right heart failure with sudden precipitous impairment of venous return to the heart but ongoing left ventricular output.¹⁴ In sudden death due to cardiac arrest a plausible physiologic mechanism for the appearance of facial and conjunctival petechiae is more difficult to hypothesise.

In the forensic literature, conjunctival and facial petechiae are well established findings in deaths due to ligature or manual strangulation, partial hanging, plastic bag-ligature suffocation, carotid sleeper holds and crush injuries to the chest. In all of

these mechanisms, the prerequisite event appears to be impairment of venous drainage of the head and neck whilst partial or intermittent arterial supply is maintained.

The subsequent mechanical trauma caused by venous congestion to the microvasculature of the ocular and facial tissues is thought to result in rupture and cutaneous bleeding.

The role of hypoxia and tissue acidosis in provoking petechial bleeding is controversial and has been challenged in the literature, as facial congestion bleeding is not a characteristic of autoerotic deaths due to plastic bag suffocation without ligature or deaths due to gag obstruction of the airway.

In addition, studies in which healthy volunteers were subjected to inverse suspension have shown that conjunctival petechiae can be induced after one minute of suspension and without out associated loss of consciousness, and therefore mechanical trauma rather than tissue hypoxia is likely to be the primary insult to tissue microvasulature in the head and neck.¹⁵

Conclusion

It is likely that our patient collapsed due to cerebral hypoperfusion resulting from transient low cardiac output from a presumed ventricular arrhythmia in the setting of acute myocardial infarction. He may have been choking as he recovered, with the associated Valsalva manoeuvre causing an acute increase in venous pressure leading to congestion bleeding of the head and neck.

Prolonged hypoxia followed by reperfusion may have contributed. To our knowledge, although the presence of facial congestion bleeding in cardiac deaths and their presumed relationship with CPR has been studied and challenged in the forensic literature, there have been no case reports in the clinical literature of head and neck petechiae or subconjunctival haemorrhage in survivors of myocardial infarction.

Author information: Caroline Mahon¹; Paul Maurice¹; Dougal McClean²

¹Department of Dermatology, ²Department of Cardiology, Christchurch Hospital, Christchurch

Correspondence: Dr Caroline Mahon, Dermatology Department, Greenlane Clinical Centre, Private Bag 92-189, Auckland Mail Centre 1142, Auckland, New Zealand. Fax +64 (0)9 6310723; email: caroline_mahon@hotmail.com

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