

CASE REPORT

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# Fatal haemorrhage from a lower limb varicose vein rupture: two case reports

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## Abstract

**Background:** Chronic venous disease is one of the most prevalent pathologies today. In Portugal, as in other western countries, its prevalence is high, affecting around 35% of the adult population. It is a chronic and progressive condition that, despite generally benign, may course with major complications, like severe bleeding.

**Case presentation:** We present the cases of a 47-year-old man and of an 82-year-old woman, with chronic venous disease and obesity, whose deaths occurred from lower limb varicose vein rupture. The gathered circumstantial information, the presence of large amounts of blood on the bodies' surfaces and clothes, and malleolus ulcers agree with the fatalities reported in scientific literature.

**Conclusions:** These cases are peculiar, both from a forensic pathology and from a clinical perspective. We want to raise awareness among the medical community about this major complication that is linked with a disease commonly perceived as benign, but that can result in a medical emergency. We also underline the importance of educating patients to this possible outcome.

**Keywords:** Chronic venous disease, Varicose veins, Haemorrhage, Medical emergency, Case report

## Key points

- Chronic venous disease is generally benign, but it may course with major complications.
- Despite rare, fatal haemorrhage constitutes a true medical emergency.
- Even a benign medical disorder can lead to death under some specific circumstances.
- Death might be perceived as violent, due to the amount of blood found at the scene.
- It is essential to raise awareness about this major complication.

## Background

Chronic venous disease is one of the most prevalent pathologies today. In Portugal, as in other western countries, its prevalence is high, affecting around 35% of the adult population. The disease's prevalence is higher in women over 30-years-old (60%), but it also affects the male population (40%) (Sociedade Portuguesa de Angiologia e Cirurgia Vascul ar 2015).

It is a chronic and progressive condition characterised by lower limb vein wall and valve dysfunction, hindering normal blood flow. Lower limbs' superficial veins are most commonly involved (Jevlev and Alexandrov 2011). Chronic blood stasis in the lower limbs leads to the onset of the first symptoms, such as pain and the sensation of tired and heavy legs (Sociedade Portuguesa de Angiologia e Cirurgia Vascul ar 2015). Despite generally benign, chronic venous disease may course with major complications, like oedema, dermatitis, venous ulcerations or severe bleeding (Jevlev and Alexandrov 2011; Serinelli et al. 2020). There is a great discrepancy in major complication prevalence regarding varicose vein rupture in the

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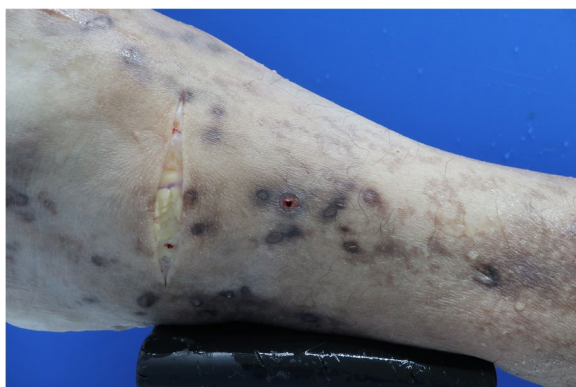
literature (Serinelli et al. 2020). Byard and Gilbert found eight cases of death resulting from lower limb varicose vein rupture in a total of 10686 autopsies throughout a 10-year period (< 0.01%) (Byard and Gilbert 2007). Conversely, Evans et al. reported 23 cases of fatal bleeding in a single year (Serinelli et al. 2020; Evans et al. 1973).

### Case presentation

The authors report two cases of victims with chronic venous disease and obesity that were autopsied in the South Branch of the National Institute of Legal Medicine and Forensic Sciences (Portugal).

The first case addresses a 47-year-old man, without known medical history, that began bleeding from his left ankle, in the presence of family members. Before the emergency team's arrival, the man lost consciousness and collapsed on the floor. Cardiopulmonary resuscitation failed and death was confirmed roughly 4 h after symptom onset. During the autopsy, it was possible to observe blood on the body's surface and clothes. The lower half of the left leg, the right ankle and both feet (dorsolateral) had multiple scars and skin pigmentation. In the centre of one of said scars (0.5 cm in diameter), above the left lateral malleolus, was a perforation with 0.2 cm in diameter (Fig. 1). Underlying this ulceration, we found a ruptured superficial vein in the subcutaneous tissue, and there were no signs of blood stain of muscle or other deeper tissues (Fig. 2).

The second case concerns an 82-year-old female that was found dead in her house, in a sitting down position. Large quantities of blood were visible on the floor throughout the house (Fig. 3). No cardiopulmonary resuscitation efforts took place. Because the circumstances raised suspicions, the Portuguese Criminal Police investigated the scene. One hour prior to her death, the victim unsuccessfully tried to call a friend. From the



**Fig. 1** Lateral aspect of left leg with chronic venous disease and perforated varicose ulcer



**Fig. 2** Lateral aspect of left leg with exposed subcutaneous tissue underlying perforated varicose ulcer

autopsy, we highlight the presence of blood on the cadaver's lower limbs, varicose veins and skin pigmentation in the legs and, also, a perforated bleeding ulcer above the left medial malleolus, with a diameter of 0.4 cm (Fig. 4), associated with the rupture of a superficial varicose vein in the subcutaneous tissue, also with no other signs of tissue blood stain (Fig. 5).

In both autopsies, we found no other relevant changes and we requested routine toxicological and histological exams.

We concluded that both victims died of natural causes, due to the rupture of a varicose vein in their left legs, in a setting of chronic venous disease and obesity.

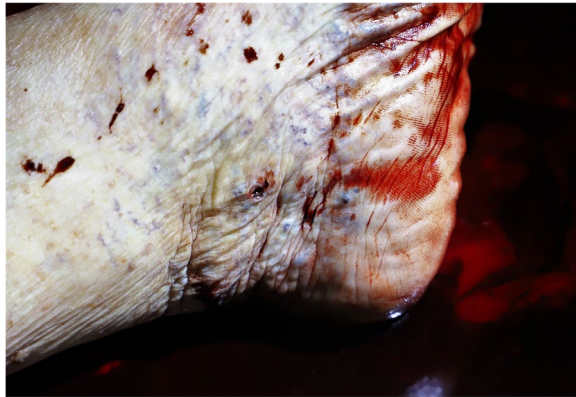
### Conclusions

As previously stated, ulceration and haemorrhage are known complications of chronic venous disease, although usually benign (Serinelli et al. 2020).

There are two types of ulceration: acute perforation, usually involving a superficial tributary vein around the



**Fig. 3** The scene of death: victim's lower limbs surrounded by a large amount of blood



**Fig. 4** Left medial malleolus with chronic venous disease and perforated varicose ulcer



**Fig. 5** Left medial malleolus with exposed subcutaneous tissue and the perforated varicose ulcer

medial malleolus (Jelev and Alexandrov 2011), consisting of a small lesion (< 0.5cm) with marginal cutaneous involvement, and chronic ulceration, comprising a wider lesion (1–10 cm) associated with skin pigmentation, induration and erosion (Fragkouli et al. 2012).

Regarding the haemorrhagic event, it can happen spontaneously or as a result of minor trauma (Serinelli et al. 2020). Irrespective of its cause, when a varicose vein ruptures, profuse bleeding may occur and can possibly lead to unconsciousness and fatal exsanguination in less than 20 min (Jelev and Alexandrov 2011). Despite rare, fatal haemorrhages from varicose vein ruptures are well documented in scientific literature (Serinelli et al. 2020; Fragkouli et al. 2012; Cocker and Nyamekye 2008). Because they may be severe, with a rapid onset of loss of consciousness, these events constitute a true medical emergency (Serinelli et al. 2020; Fragkouli et al. 2012).

Fatal haemorrhage can be triggered by factors such as advanced age, social isolation, alcohol abuse, anticoagulation medication and comorbidities like dementia, chronic ischemic heart disease and liver cirrhosis (by impairing the normal production of coagulation factors) (Fragkouli et al. 2012).

In the presented cases, both victims had chronic venous disease, with several skin changes in their lower limbs. Family members, who helped the first victim and called the emergency services upon the deterioration of his clinical condition, accompanied him. On the contrary, the second victim was alone and tried to get help from a friend without success.

The gathered circumstantial information, the presence of large amounts of blood on the bodies' surfaces and clothes, and malleolus ulcers agree with the fatalities reported in scientific literature.

In cases like the ones presented, death might be perceived as violent, due to the large amount of blood found at the scene (Fragkouli et al. 2012).

It is generally perceived that patients with chronic venous disease do not get routine medical counselling on haemostasis control (Cocker and Nyamekye 2008), and these victims are unaware of the complications associated with such a disease. That fact, combined with the lack of health care providers' knowledge on this subject, leads to an incorrect assessment of the situation's severity and, as a result, no early preventive nor, ultimately, life-saving intervention takes place (Fragkouli et al. 2012).

In addition, circumstances of death are also not always clear, and additional information is sometimes unavailable.

These cases are peculiar, both from a forensic pathology and from a clinical perspective, bearing an important and preventive message. In that sense, it is our aim to help the medical community to acknowledge this major complication linked with a disease generally recognised as benign. In fact, in some cases, its manifestations can be severe or even result in death. Likewise, we intend to emphasise the need to alert patients for this outcome, so that they can recognise the need to call emergency services, as well as accurately explain their situation when doing so.

#### Acknowledgements

We would like to express our sincere gratitude to all people who gave their support and guidance to accomplish this manuscript.

#### Authors' contributions

MS was the specialist doctor responsible for the medico-legal autopsy and report of the first case described. CG was the specialist doctor responsible for the medico-legal autopsy and report of the second case described. DL was the resident doctor collaborating in both autopsies and medico-legal reports. All authors made substantial contributions to the conception and drafting of the manuscript. All authors read and approved the final manuscript.

**Funding**

The authors did not receive support from any organisation for the submitted work.

**Availability of data and materials**

Not applicable.

**Declarations****Ethics approval and consent to participate**

Necessary ethical approval was obtained from the institute's ethics committee.

**Consent for publication**

Necessary consent for publication was obtained from the institute's board of direction.

**Competing interests**

The authors declare that they have no competing interests.

Received: 22 January 2022 Accepted: 2 May 2022

Published online: 11 May 2022

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