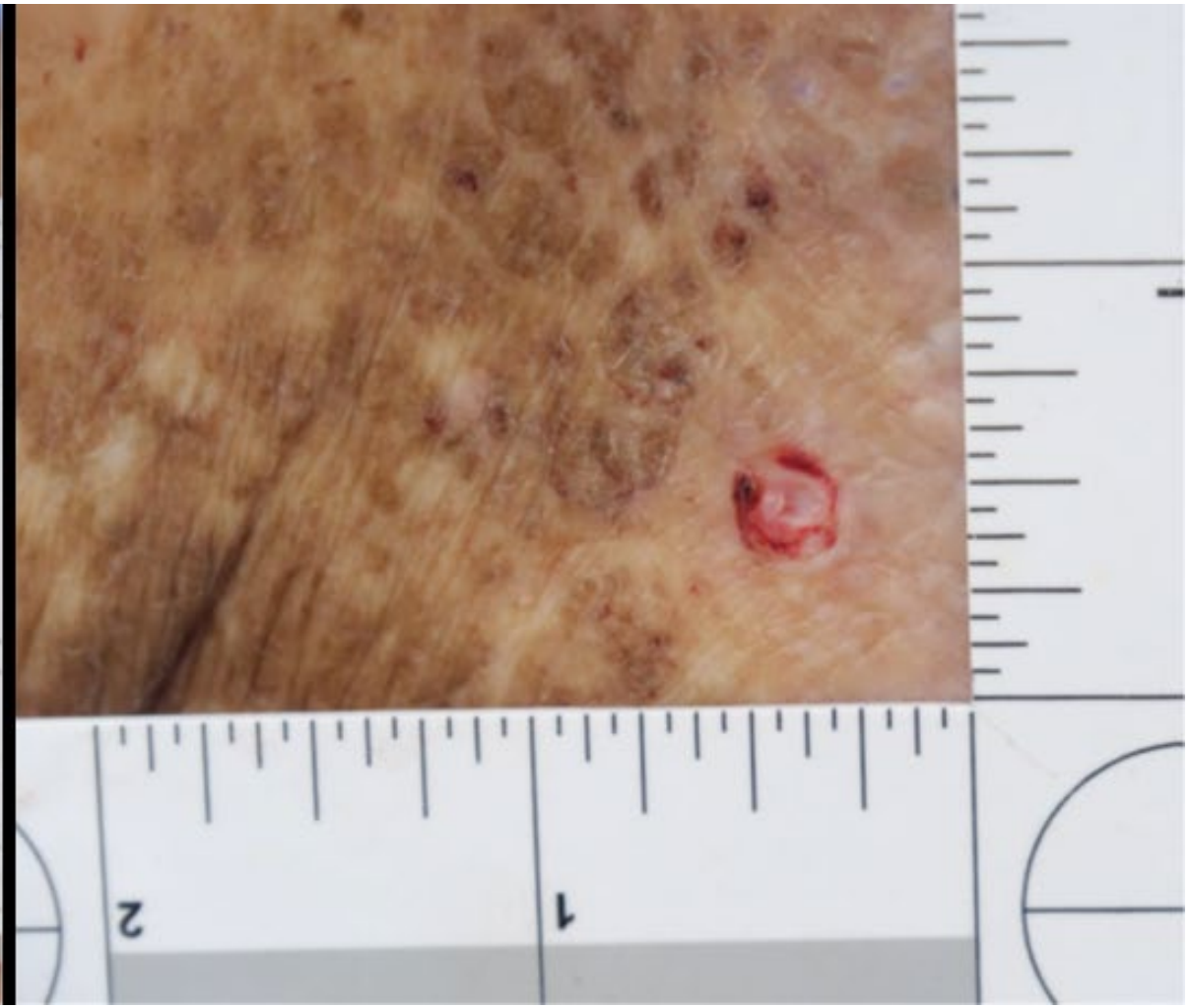
Case #50

NAME Educational Activities Committee

Case provided by:

Dr. Nika Aljinovic (Assistant Medical Examiner-Coroner, Santa Clara County Medical Examiner-Coroner Office, San Jose, CA) and
Dr. Nicole Croom (Fellow, King County Medical Examiner's Office, Seattle, WA)


BAND-AID



1. An 80-year-old man with history of chronic tobacco use, abdominal aortic aneurysm and obesity was found unresponsive on the bathroom floor of his locked residence. There was blood on a towel in front of his reclining chair, in the bathtub, and on the floor around his legs. His regular podiatry appointment was scheduled for the day of discovery and, per family, he regularly "prepped" his feet the day prior to his appointments by soaking them and peeling off dead skin.

Examination shows a rare complication of which of the following:

- ◯ Gunshot Wound of the Foot
- ◯ Malignant Melanoma
- ◯ Ruptured Abdominal Aortic Aneurysm
- ◯ Stab Wound of the Foot
- ◯ Varicose Veins

Answer...

E. Varicose veins – (CORRECT ANSWER, 60.94 % of responses)

The photos show exsanguination due to a ruptured varicose vein. A perforated vessel can be seen in the close-up photos of the circular ankle ulceration. Sudden natural death from fatal varicose bleeding is a very rare phenomenon. Due to the amount of blood at the death scene, there is often concern for accident, suicide, or homicide.

Varicose veins can be the result of connective tissue disorders or venous valve failure with subsequent blood backflow, chronic venous distension, and elevated intravascular venous pressure. Risk factors include female sex, old age, prolonged standing and sitting, obesity, and venous obstruction, such as deep vein thrombosis. Vein rupture can occur spontaneously or due to (minor) trauma and are more common if varicose veins are overlying a protuberance (lower leg and malleolus region). If there are cutaneous changes due to chronic venous stasis, the skin is vulnerable and may be injured easily.

Evans et al. classified venous ulcerations into two types: acute perforating ulcers which are typically smaller than 5 mm in diameter with only slight alterations in the surrounding skin and chronic ulcers which usually have larger diameters of 1–10 cm with significantly altered surrounding skin. Take home point: chronic venous insufficiency is generally a non-fatal disease; however, varicose rupture, followed by massive venous hemorrhage and inadequate medical acute care can quickly lead to unconsciousness and death.

A. Gunshot wound of the foot (1.06 % of responses)

Although the circular defect in the foot can be concerning for an entrance gunshot wound, at first glance, the clinical history, scene investigation, and examination findings are more consistent with fatal varicose bleeding. While, hemorrhage is a common complication of gunshot wounds, there are no mentions of other injuries (e.g. fractures, exit wound) or retained projectiles.

B. Malignant melanoma (18.10 % of responses)

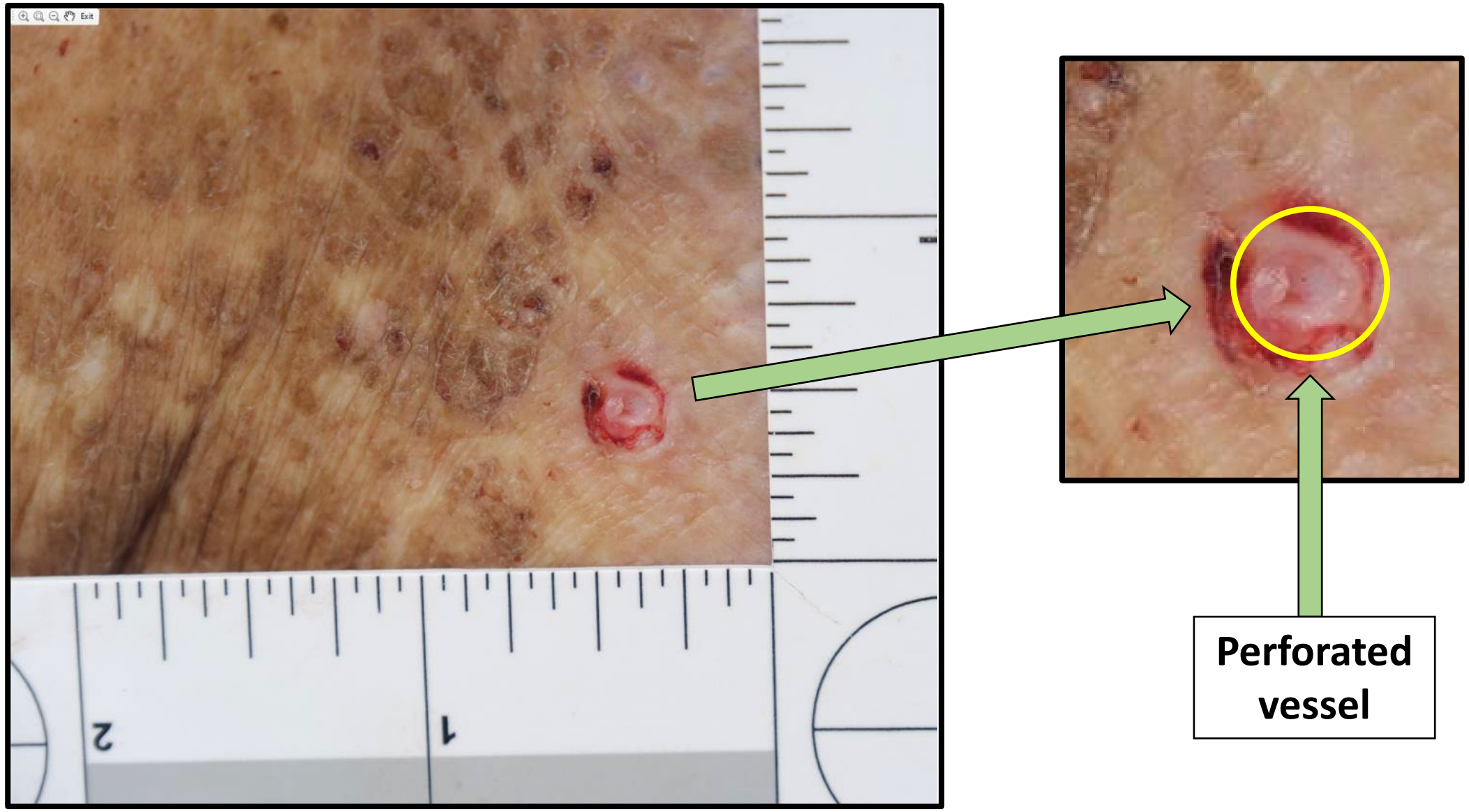
Cutaneous melanoma can develop on any skin or mucosal surface. Foot and ankle lesions represent around 3-15% of all cutaneous melanomas, the majority of which arise on the acral (plantar) surface of the foot. Since the foot is difficult to see and seldom checked, changes may not be readily observed or noted by the patient. However, this patient had regular podiatry appointments, which indicates he would have been getting regular screening. These tumors can be amelanotic so a lack of pigment in this case does not rule out this entity; however, ulcerations associated with melanoma tend to be larger with serpiginous borders. The background chronic stasis changes, defect location, and consistent podiatry care with no mention of melanoma history favor ruptured varicose vein.

C. Ruptured abdominal aortic aneurysm (AAA) (10.41 % of responses)

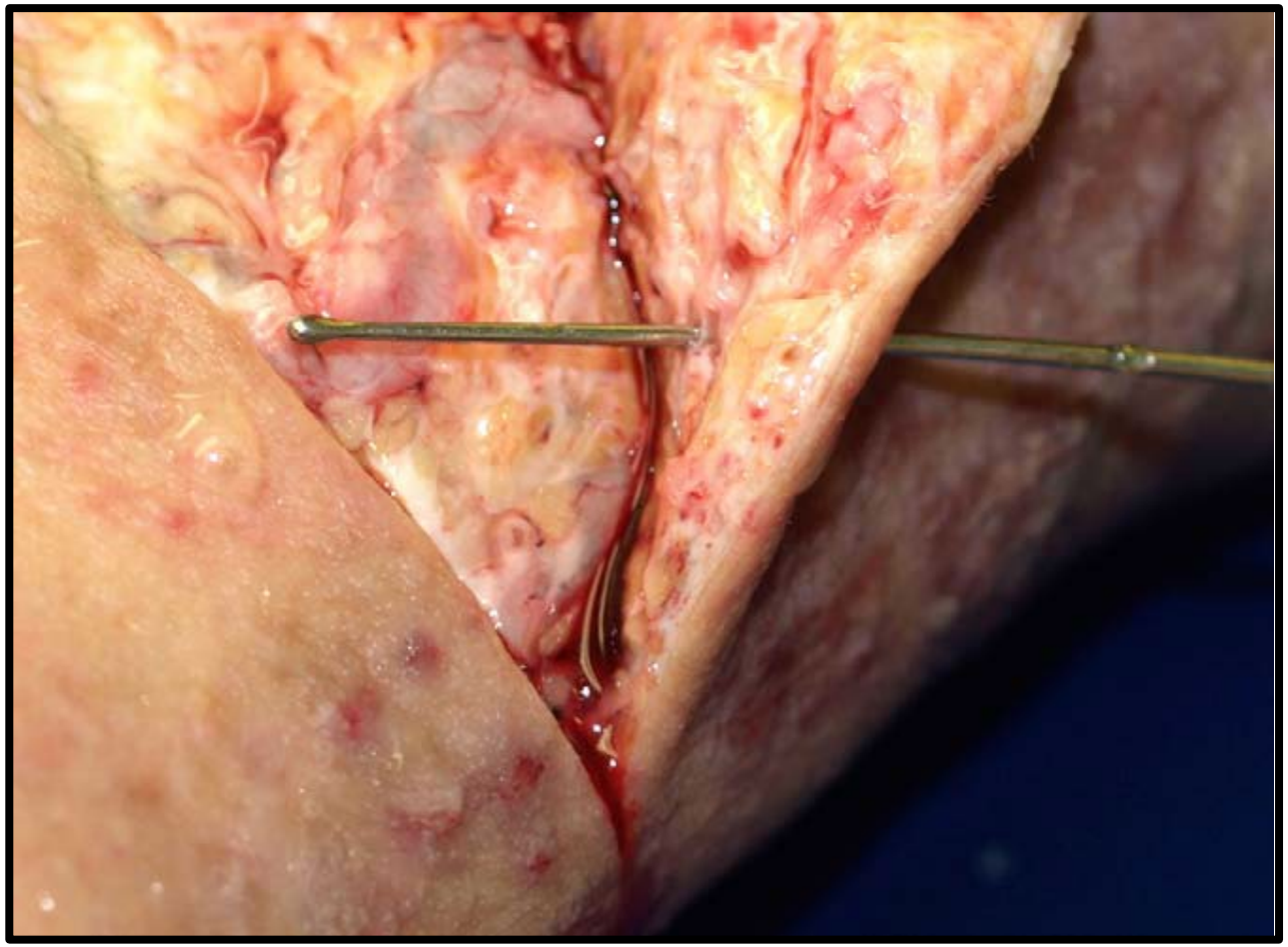
While the patient has a clinical history of AAA, ruptured AAAs cause massive *internal* bleeding and, unlike gastrointestinal bleeds, hemorrhage from a ruptured AAA has no external connection to the outside world. Therefore, the massive amounts of blood present at the scene are incompatible with this diagnosis. A ruptured AAA would also not cause a circular defect in the foot (we wouldn't put a non-educational red herring in here… or would we).

D. Stab wound of the foot (9.50 % of responses)

While the circular defect in the foot is concerning for a puncture wound and hemorrhage is a common complication of stab wounds, the clinical history and examination findings are more consistent with fatal varicose bleeding. Photographs show chronic stasis changes around the circular defect and the location of the defect (on the lateral/medial rather than the plantar aspect of the foot) would be unusual for a wound sustained while walking around barefoot.


Perforated vessel

Superficial layer dissection with a metal-probe in the small skin ulceration. There is induration of the surrounding skin with many subcutaneous tortuous dilated veins.



Doberentz E, Hagemeier L, Veit C, Madea B. Unattended fatal haemorrhage due to spontaneous peripheral varicose vein rupture--two case reports. Forensic Sci Int. 2011 Mar 20;206(1-3):e12-6. doi: 10.1016/j.forsciint.2010.06.020. Epub 2010 Jul 23. PMID: 20655677

REFERENCES

1. Bristow IR, de Berker DA, Acland KM, Turner RJ, Bowling J. Clinical guidelines for the recognition of melanoma of the foot and nail unit. J Foot Ankle Res. 2010 Nov 1;3:25. doi: 10.1186/1757-1146-3-25. PMID: 21040565; PMCID: PMC2987777.
2. Doberentz E, Hagemeier L, Veit C, Madea B. Unattended fatal haemorrhage due to spontaneous peripheral varicose vein rupture--two case reports. Forensic Sci Int. 2011 Mar 20;206(1-3):e12-6. doi: 10.1016/j.forsciint.2010.06.020. Epub 2010 Jul 23. PMID: 20655677.
3. Evans GA, Evans DM, Seal RM, Craven JL. Spontaneous fatal haemorrhage caused by varicose veins. Lancet 1. 1973, 1359–1361.