Case #145

NAME Educational Activities Committee

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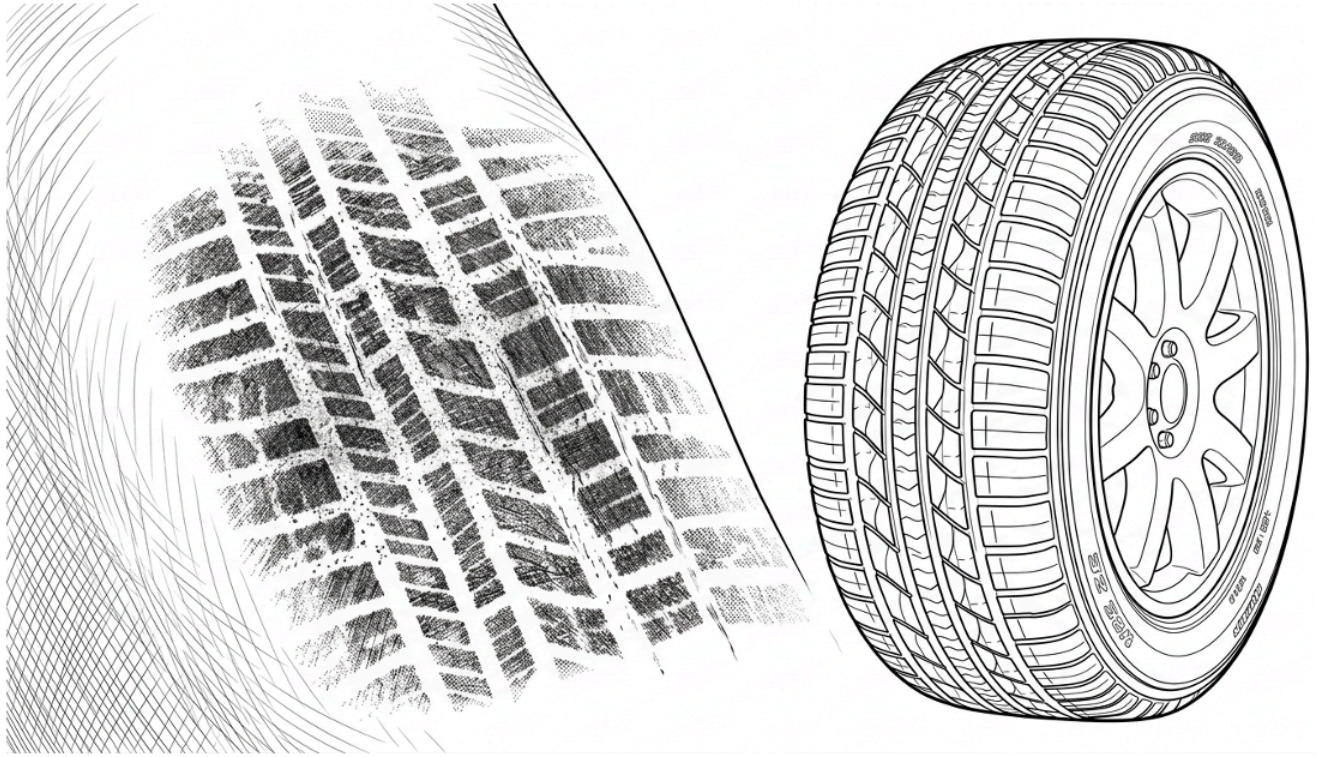
An adult male is found unresponsive outdoors and pronounced dead at the scene. At external examination, among other injuries, the finding shown in the photo is documented on the upper extremity. The injury pattern shown is most consistent with the body found where?

A. At the base of a metal fire escape staircase
B. On the ground at the edge of a two-lane roadway
C. Floating in a lake marina, near a motorboat
D. Lying on an exposed industrial metal heating grate

Answer...

B. On the ground at the edge of a two-lane roadway (1 of 2) – (CORRECT, 25% of answers)

The injury demonstrates multiple parallel bands of frictional abrasion alternating with linear zones of intact skin, a morphology produced when a ridged surface rolls over or drags across the skin under compressive force. Tire tread contact generates exactly this pattern: the raised tread elements compress and abrade the skin while the grooved recesses spare it, resulting in the characteristic alternating red and white banding. The regular spacing and consistent orientation reflect the geometry of the tread pattern and are diagnostic of this mechanism.



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B. On the ground at the edge of a two-lane roadway (continued – 2 of 2)

This injury type is classified as a patterned imprint abrasion, a subset of patterned injuries in which the causative object leaves a recognizable geometric impression on the skin surface. Imprint abrasions from vehicle wheels (‘tire marks’) are forensically relevant because the spacing, width, and arrangement of the abrasion bands can potentially be matched to a specific tire model or tread design, which may assist in identifying the responsible vehicle, although such matching must be performed with caution to avoid overspeculation.

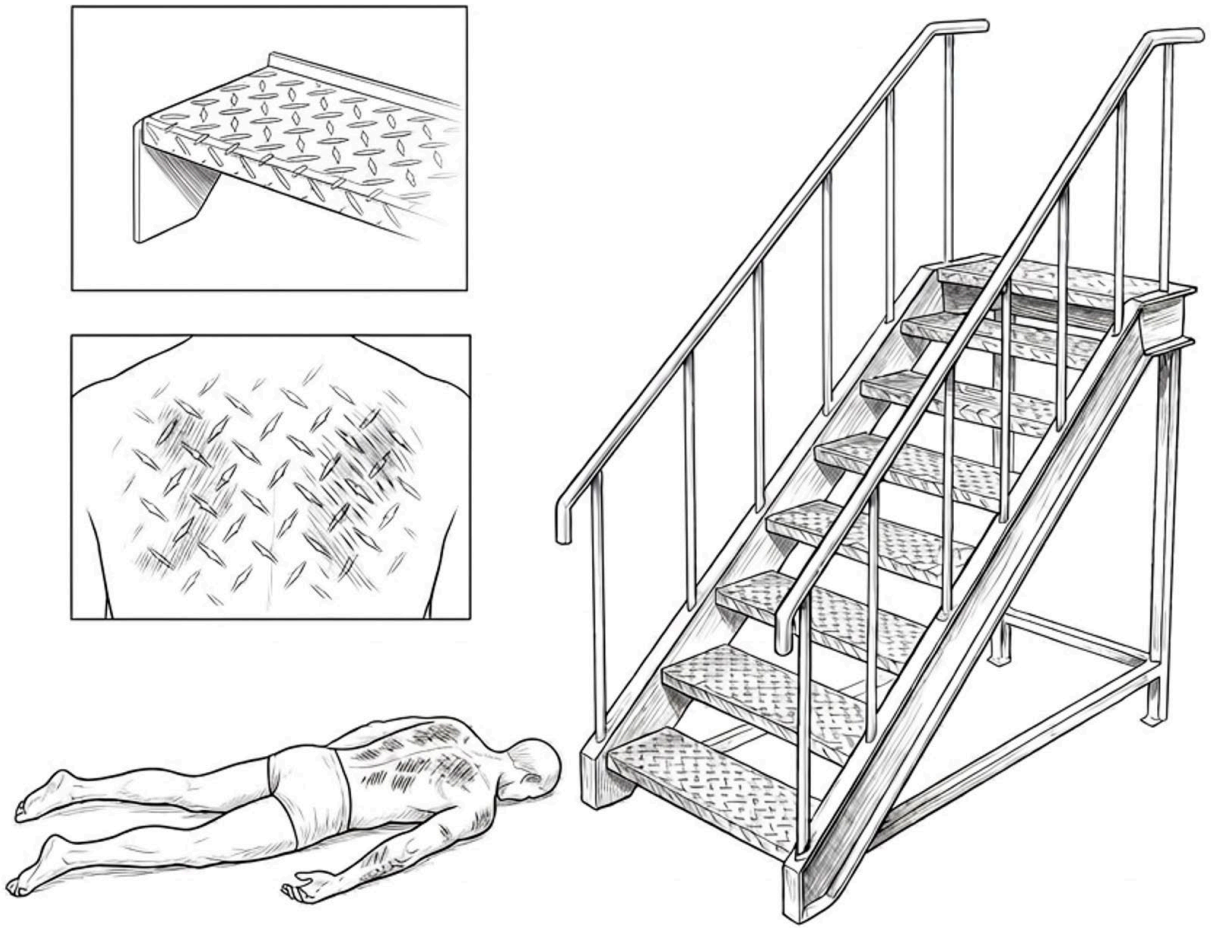
A rolling tire passing over an outstretched or ground-level arm would produce compressive tread contact of this type. However, this injury pattern can result from either direct tire rollover, in which the wheel passes directly over the limb, or from tangential tread drag, in which the moving tire makes glancing contact with the skin.

In this case the body was discovered outdoors with multiple injuries due to a motor-vehicle striking and running over the body during a hit-and-run.

Other responses…

A. At the base of a metal fire escape staircase (INCORRECT, 16.67% of answers)

Metal fire escape treads are parallel, evenly spaced, and ridged, and contact with them during a fall could theoretically produce banded patterned abrasions with intervening skin sparing. However, a fall down a staircase involves dynamic, irregular, multidirectional contact forces. The resulting injuries would be expected to show variable spacing, inconsistent orientation, and superimposed contusions or lacerations from impact. The uniform geometric regularity and consistent band width seen in the injury pattern showed in the autopsy photo is not characteristic of staircase-associated trauma.



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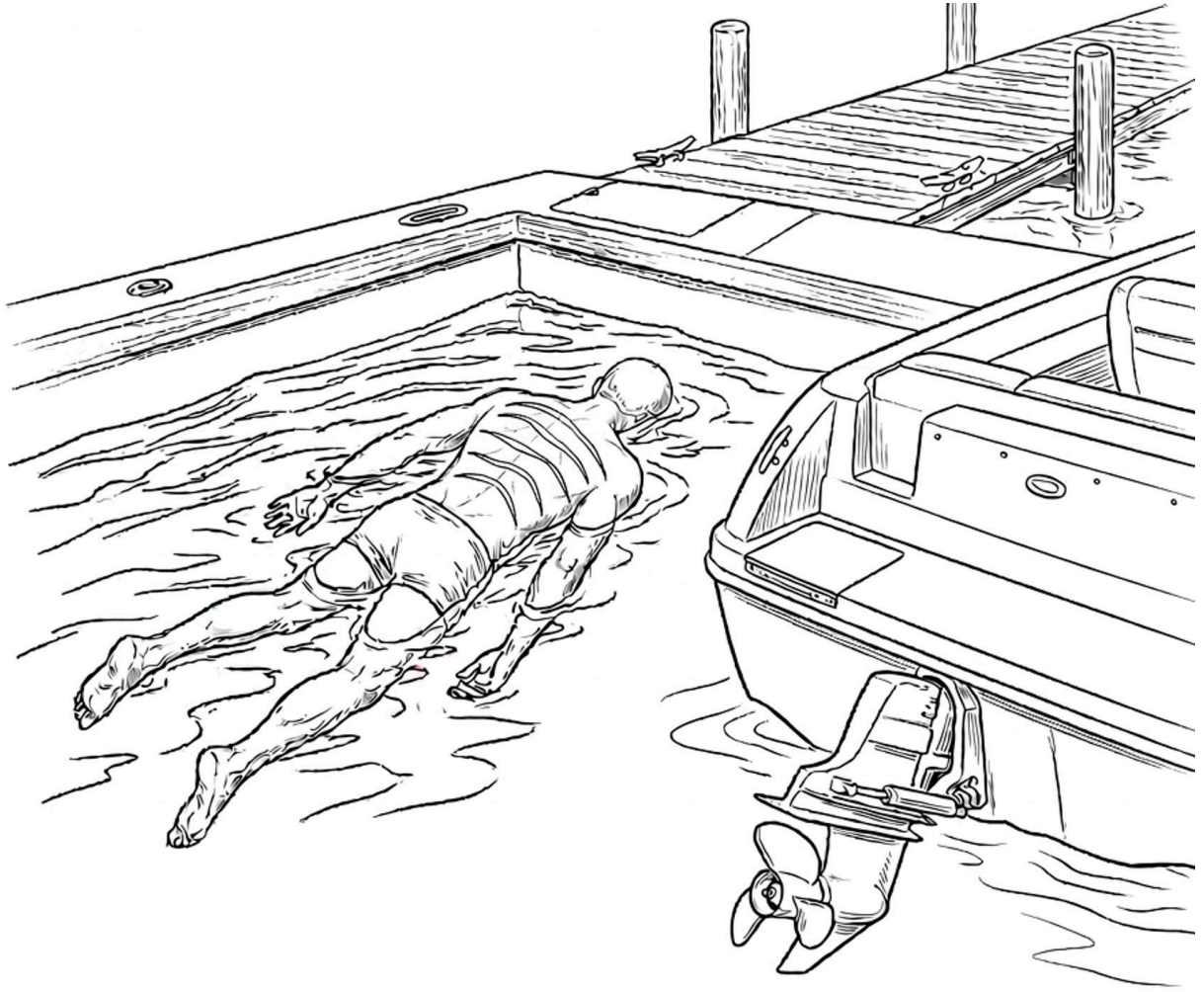
C. Floating in a lake marina, near a motorboat (INCORRECT, 0% of answers)

Motorboat propeller injuries produce parallel, regularly spaced wounds that may superficially resemble a patterned injury. However, a rotating motorboat propeller typically inflicts parallel and equidistant chop wounds, reflecting the rotational cutting mechanism of the blades. The injuries in this image are frictional abrasions without evidence of chop-like trauma, which is incompatible with propeller-associated injuries. Additionally, propeller wounds typically follow a curvilinear or arc-shaped distribution consistent with blade rotation, not the linear parallel orientation seen here.



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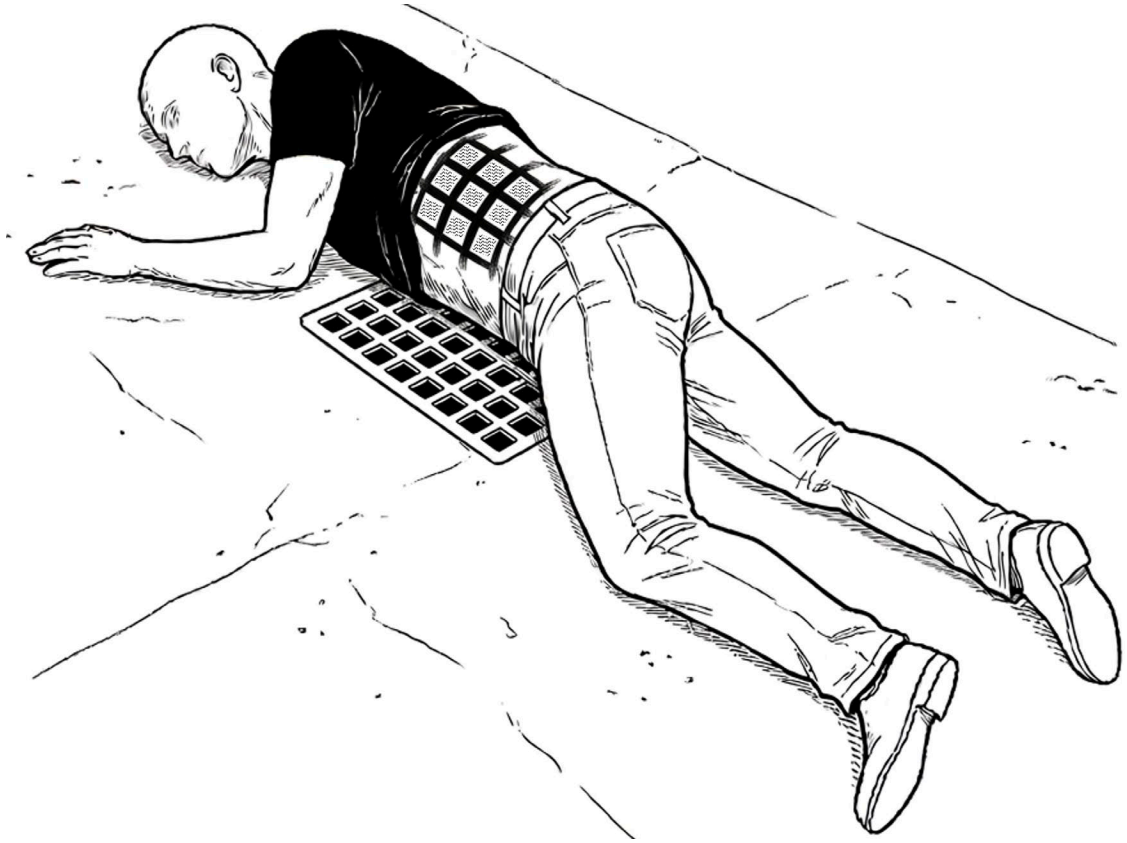
D. Lying on an exposed industrial metal heating grate (INCORRECT, 58.33% of answers)

A metal heating grate in prolonged or high-temperature contact with skin produces patterned thermal injuries that can mimic the banded geometry seen here, with erythema or necrosis at contact points and sparing between the raised elements. The critical distinction is wound character: thermal contact injuries show sharply demarcated burns, blistering, or eschar formation without the epidermal shearing, tissue drag, or embedded particulate matter associated with frictional abrasion.



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