

A Case of Pediatric Sudden Death with Insidious Bacterial Myocarditis

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Abstract

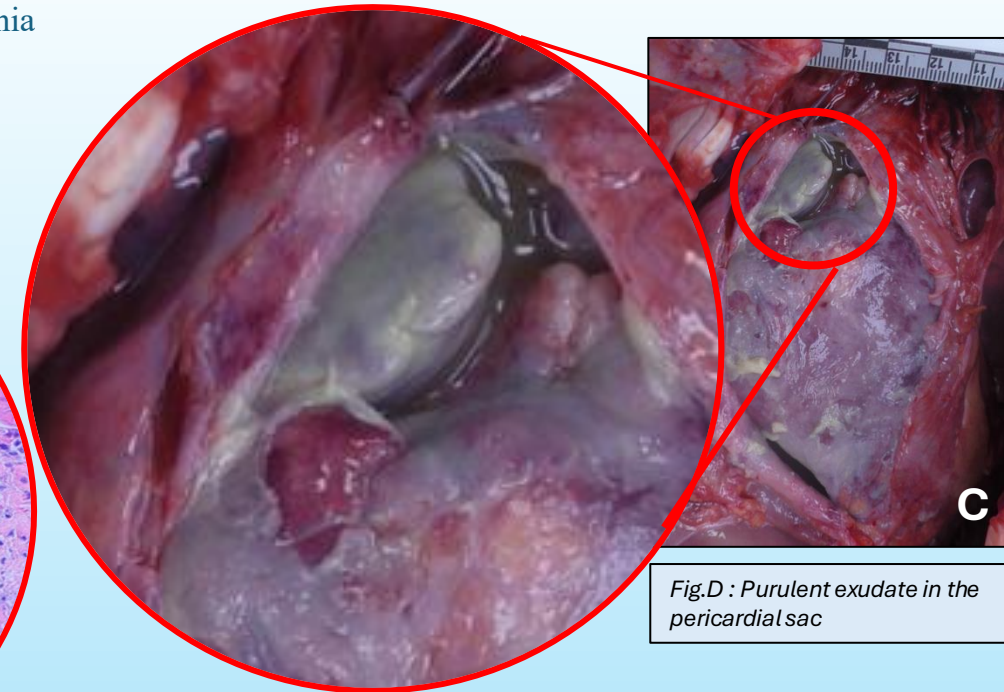
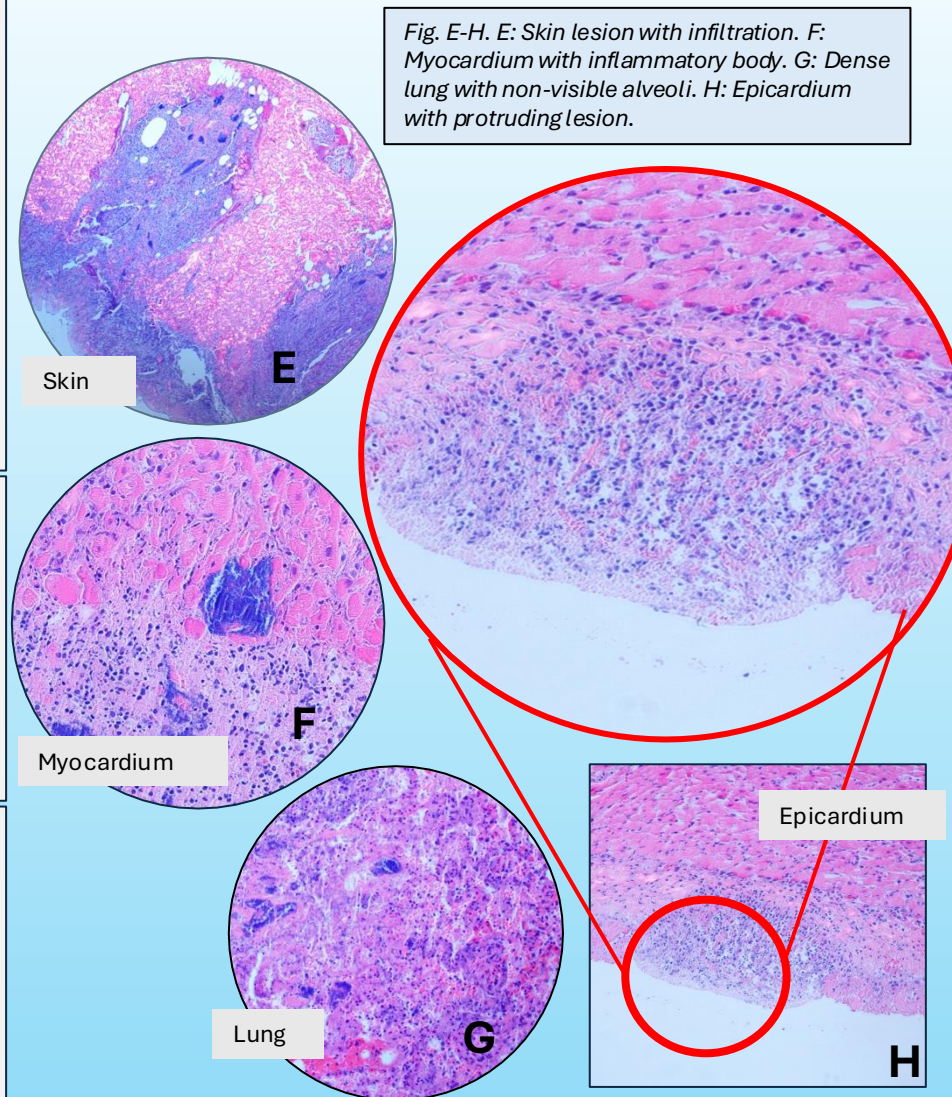
- Bacterial infections in childhood are common, rarely fatal, and usually quickly recognized and diagnosed by characteristic symptoms such as fever and malaise. Bacterial infections causing death, in healthy children, without prodrome, are rare.
- A 7-year-old child became unexpectedly unresponsive shortly after playing outside, complaining of thirst and drinking an electrolyte drink.
- The child was exhibiting limited indicators of sickness before death, which is atypical from the usual signs of serious bacterial infections.
- The examination revealed presence of *Staphylococcus aureus* in the blood and cerebrospinal fluid. Inflammation and necrotic exudate were found on the heart and in the pericardium, with invasion into the lungs, and inflammatory bodies on histology.
- The cause of death was attributed to disseminated *S. aureus* infection, and the manner of death deemed natural.

Autopsy Findings

Upon autopsy the child was found to be well nourished, with no sign of external injury, or other sickness. On the lower back skin lesions were found (Fig. A), consistent with impetigo, some of which were scarred, which could indicate longstanding infection. The lungs weighed 598g combined (expected = up to 415g), with diffuse congestion and areas of hemorrhage (Fig. B). The heart was covered with purulent exudate which extended throughout the pericardial sac (Fig. C). Multiple areas of pallor in the myocardium could be suggestive of infarction or bacteria cluster (Fig. D), and heart weight was 179g (expected= 140g). Kidney showed no pathology.

Histological/Microscopic Exam

Sections were taken from the skin lesions, the heart (myocardium, epicardium), and the lungs. The skin showed cutaneous infiltration into the dermis (fig. E). Bacterial infiltration is apparent throughout the heart, with *S. aureus* organisms visible and inflammatory bodies (fig. F/fig. H). Inflammation and macrophagic activity was increased. The lungs have diffuse inflammation and occlusion of alveoli with bacteria and lymphocytes (fig. G). Culture swabs from the skin showed no viral agents present. Vitreous electrolytes showed signs of acute kidney injury. Blood and Cerebrospinal Fluid Cultures found Methicillin Resistant *S. aureus*.



Discussion

Impetigo is an infection caused by cutaneous colonization with staphylococcus aureus. It is a common disease of childhood and is one of the only skin infections with serious sequelae¹. *S. aureus* has been found to be the most common cause of endocarditis in pediatric patients, with a survival rate of over 90% when appropriate care is received². Disseminated *S. Aureus* infection can also lead to kidney disease and sepsis, as is seen in this case. The complete infection of the heart and spread into the lungs indicates that the level of bacterial invasion was quite extensive, however no severe symptoms preceded his collapse except thirst, which can be exacerbated by sepsis. Symptoms of bacterial carditis and sepsis can range from flu like, to mimicking myocardial infarction³, and “vague” symptoms are associated with a worse clinical outcome⁴. The child was also given doses of over-the-counter flu medicine, which could have masked his symptoms up to a point.

Conclusion

Due to the high bacterial load, kidney injury, and evidence of sepsis the cause of death was deemed natural from disseminated *S. aureus* infection with fibrinopurulent pericarditis and myocardial abscess. The suspected route of entry is most likely to be attributed to the skin infection discovered, however there is no way to rule out other portals. This case highlights the possibility of seemingly minor skin infections to disseminate bacteria with fatal cardiac involvement.

References

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