

## A case of sudden death due to septic pulmonary embolism

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### Abstract

**Introduction:** Sudden deaths in hospital following a short duration of seemingly improving illness arouse suspicion of medical maltreatment. It is mandatory to have a medico-legal investigation in to such deaths. Facts, explanations, and opinions made by the forensic pathologists at the end of an autopsy examination are of crucial importance to eliminate or confirm such doubts. We report how a thorough autopsy examination including ancillary testing can lead to effective administration of justice in such cases.

**Case History:** A 42 year woman with diabetes mellitus was admitted to hospital with fever and right knee joint swelling and tenderness of one week's duration. There was cellulitis over the right knee joint and underlying septic arthritis. Surgical drainage of the joint was done and intra venous antibiotics were given and the condition seemed to be improving. On the 4<sup>th</sup> day of admission, she developed sudden onset of shortness of breath and central chest pain resulting in death 12 hours later. At autopsy she was pale and icteric. There was evidence of septic arthritis with surrounding necrotizing fasciitis and deep venous thrombosis of the right calf. There was consolidation of the right lung with patchy focal pale yellow areas with surrounding erythema, and evidence of multi-organ sepsis. Microscopy confirmed multi organ involvement and revealed pneumonia of the right lung with early abscess formation and multiple bilateral peripheral septic thrombo emboli. There was septic thrombosis of the calf veins with associated thrombo phlebitis.

**Conclusion:** Facts revealed at autopsy explained the sudden death and the possibility of such death was scientifically clarified. The cause of death was concluded as septic pulmonary thrombo embolism due to deep venous septic thrombosis and thrombophlebitis due to septic arthritis and necrotizing fasciitis.

**Key words:** *sudden death, septic arthritis, thrombo phlebitis, septic emboli, abscess*

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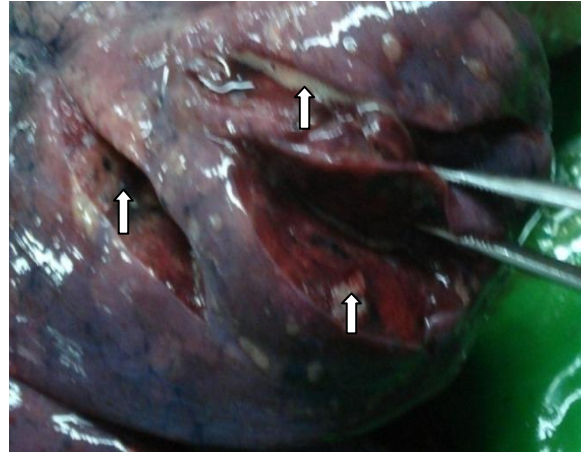
## Introduction

Sudden deaths in hospital following a short duration of seemingly improving illness arouses suspicion of medical maltreatment. It is mandatory to have a medico-legal investigation in to such deaths. Facts, explanations, and opinions made by the forensic pathologists at the end of an autopsy examination are of crucial importance to eliminate or confirm such doubts. We report how a thorough autopsy examination including ancillary testing can lead to effective administration of justice in such cases.

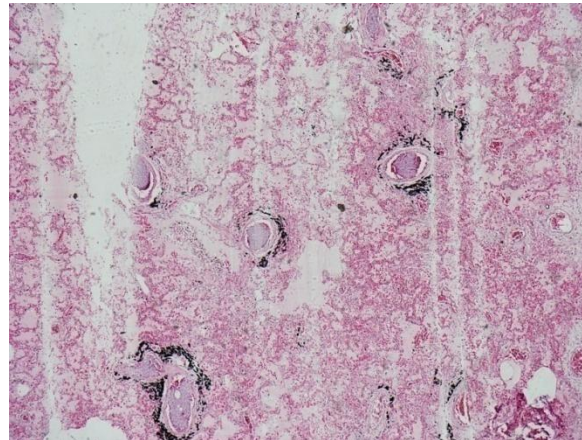
## Case report

A 42 year woman with diabetes mellitus was admitted to hospital with fever with right knee joint swelling and tenderness of one week duration. There was cellulitis over the right knee joint and underlying septic arthritis. Surgical drainage of the joint was done and intra venous antibiotics were given and the condition seemed to be improving. On the 4<sup>th</sup> day of admission, she developed sudden onset of shortness of breath and central chest pain resulting in death after 12 hours. At autopsy she was pale and icteric. There was evidence of septic arthritis with surrounding necrotizing fasciitis and deep venous thrombosis of the right calf. There was consolidation of the right lung with patchy focal pale yellow areas with surrounding erythema (Figure :1 ), and evidence of multi-organ sepsis. Microscopy confirmed multi organ involvement and revealed pneumonia of the right lung with early abscess formation and multiple bilateral peripheral septic thrombo emboli. (Figure: 2)There was evidence of muscle necrosis, oedema and cellular infiltrates of the calf. Septic

thrombosis of the calf veins with associated thrombo phlebitis was evident (Figure:3). There were micro abscesses in the liver and spleen (Figure:4)and evidence of acute pyelonephritis in the kidneys.



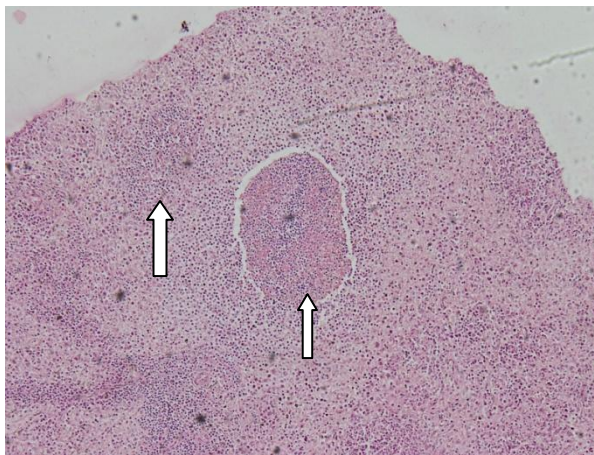
**Figure1: Patchy focal yellow lesions of the lungs**



**Figure2: multiple peripheral septic thrombo emboli of the lungs**



**Figure 3: Septic thrombosis of the calf veins with associated thrombophlebitis**



**Figure 4: Micro abscess formation of the spleen**

## Discussion

Septic pulmonary embolism (SPE) is an uncommon condition. Usually presentation is with an insidious onset of fever, respiratory symptoms, and lung infiltrates. [1,2]. Condition usually follows tricuspid valve endocarditis, alcoholism, skin infection, immuno deficiencies, peripheral septic thrombophlebitis and organ transplants. [1] It is usually known to have a delayed diagnosis and sometimes only discovered at the autopsy like in this case. [3]

This woman with septic arthritis was recovering after surgical drainage and intravenous antibiotics. She developed sudden onset of dyspnoea and central chest pain resulting in death within a short duration. The autopsy revealed evidence of septic arthritis with surrounding necrotizing fasciitis, septic pulmonary emboli, and septic thrombosis associated with deep venous thrombophlebitis and multi organ sepsis with micro abscesses of lungs and liver.

Septic arthritis is commonly due to haematogenous spread, but sometimes due to direct spread from a neighbouring infection. If treatment is delayed, septic arthritis has a mortality rate between 5% and 15 % often as a result of septic shock [4]. Septicemia is a known complication resulting from the transient or chronic bacteremia associated with most cases of septic arthritis. [4] However, such deaths usually have a more progressively deteriorating course rather than a sudden deterioration of seemingly improving condition. Sudden deterioration of her condition points towards pulmonary thrombo embolism; another well known complication of septic arthritis [5]. On the other hand, septic pulmonary embolism is a reported complication and needs to be considered as a cause for her sudden onset of dyspnoea and death within few hours [6]. Local spread of the infection can lead to septic thrombophlebitis of the adjacent deep veins. Pieces of the infected clot in the deep veins can break off and travel to the lungs as emboli blocking branches of the pulmonary artery. Furthermore, acute disseminated bacterial disease is a reported complication of acute osteomyelitis complicating deep vein thrombosis and

septic thrombophlebitis and septic pulmonary embolism. [7]

The sudden deterioration of her condition can be explained by the aggressiveness of infection combined with an ongoing showering of septic emboli from the deep venous thrombosis. The embolic blood clot that leads to an infarction in the pulmonary vasculature also contains microorganisms that provoke a focal abscess. This explains the formation of multiple abscesses in the lungs. Radiologically, heterogeneous subpleural wedge-shaped densities with various degrees of cavitation are usually reported as complications of septic pulmonary embolism.[8] There were no demonstrable septic emboli in her other organs. Multi organ dysfunction associated with sepsis is not necessarily due to the effects of seeded bacteria and can well be explained by the systemic inflammatory response syndrome with diffuse endothelial disruption. [9]. However the abscess formation in lungs and spleen can be explained as a consequence of seeded bacteria throughout the body. This can result either from the focus of septic arthritis and necrotizing fasciitis or from thrombophlebitis by the bloodstream.

## Conclusion

The forensic pathological investigation in this case served to prove that the death had no relationship to the surgical or medical management. The case illustrates the importance of complete autopsy examination with ancillary testing in clarifying and correlating pre autopsy circumstances. Facts revealed at autopsy explained the sudden death and the possibility of such death was scientifically clarified. The cause of death was concluded

as septic pulmonary thromboembolism due to deep venous septic thrombosis and thrombophlebitis due to septic arthritis and necrotizing fasciitis.

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**Contribution of authors**

Performing the autopsy-NASPW

Opinion- NASPW, IDGK

Writing the manuscript –IDGK

Revising the manuscript- IDGK, NASPW