

Pantoea Species-Induced Peritonitis: A Post-Mortem Case-report from Rwanda

D. Nyamwasa¹, H. Mushumba², F. Sinayobye¹, J. Byukusenge¹, L. Mutesa³,
K. Püschel²

¹Kigali Forensic Laboratory, Rwanda

²Institute of Legal Medicine,
University Medical Center Hamburg-Eppendorf, Hamburg/Germany

³College of Medicine and Health Sciences, University of Rwanda, Rwanda

***Correspondence to Author:** CP. Dr. Daniel Nyamwasa, MD
Kigali Forensic Laboratory
Kigali, Rwanda
dnyamwasa@gmail.com

Keywords (MeSH): Peritonitis; Autopsy; Pantoea; Rwanda

INTRODUCTION

Pantoea is a genus of gram-negative bacteria in the family Enterobacteriaceae and includes at least 20 species (1). The most commonly isolated *Pantoea* species in humans is *Pantoea agglomerans*, formerly known as *Enterobacter agglomerans* or *Erwinia herbicola* (2). *Pantoea* species are commonly isolated from plants, especially apple and pear trees (3); therefore, related infections are rarely reported in humans, particularly in immunocompetent subjects. *Pantoea* species has been shown, however, to be an opportunistic pathogen causing wound, blood, and urinary tract infections in immunosuppressed patients that, when not appropriately managed in a timely manner, can rapidly lead to death.

We report a case of a 44-year-old man who rapidly succumbed to death after a brief onset of symptoms. An autopsy done at the Kigali Forensic Laboratory in Kigali-Rwanda revealed a *Pantoea* species induced peritonitis and subsequent septic shock as the cause of death.

CASE REPORT

A 44-year old male prisoner complained of sudden onset abdominal pain and diarrhea after a short stay in prison. His transfer to a hospital was immediately arranged, but he suddenly collapsed during transportation to the hospital and was confirmed dead upon arrival. The patient was a known recreational drug user, however, no significant past medical history or family medical history was known. A post-mortem examination was requested to determine the cause of death.

EXTERNAL EXAMINATION

The patient was an adult male of dark-skin color, moderate build and a body length of 166cm. No lesions suggestive of external trauma were noted upon external examination. No injection marks were noted. Rigor mortis in all extremities was fully formed; lividity was noted on the dorsal aspect of the body. A foul-smelling liquid stool was identified in the clothing.

AUTOPSY FINDINGS

The bowels were massively distended and had a reddish discoloration upon inspection (Figures 1 and 2). No bowel perforation was noted. Approximately 2 liters of greenish-

yellow, viscous, and foul-smelling inflammatory fluid was found in the abdominal cavity. Fibrin-formation was noted on the edges of the bowels. Extensive blood clotting and softening of the spleen suggestive of septicemia were noted. No gross pathology of the internal organs was noted.

The cause of death was septic shock, secondary to peritonitis, and the manner of death was natural. Since there were no other factors such as bowel or organ perforation to suggest the origin of the peritonitis in our case, samples of blood, peritoneal fluid, and stool matter were collected and analyzed at the National Reference Laboratory in Kigali to further investigate the cause of death. *Pantoea* species was isolated from the peritoneal sample. No other pathogen was isolated from the peritoneal and stool samples (**Table 1**).

No	Types of Samples	Conditions	Identification/Comment
1	Blood	<ul style="list-style-type: none"> ▪ Approximately 10ml of blood ▪ Specimen was in a dry tube ▪ Blood specimen already clotted 	<ul style="list-style-type: none"> ▪ Sample rejected ▪ Not tested
2	Stool	<ul style="list-style-type: none"> ▪ Semi-solid stool specimen ▪ Greenish in color 	<ul style="list-style-type: none"> ▪ No pathogen isolated
3	Peritoneal fluid	<ul style="list-style-type: none"> ▪ Pale-green fluid specimen 	<ul style="list-style-type: none"> ▪ <i>Pantoea</i> species isolated

Table 1: Laboratory investigation results showing isolation of the *Pantoea* species in the peritoneal fluid specimen taken during the autopsy.



Figure 1: Pus collection noted in the peritoneal cavity.



Figure 2: Massive distension and edema of the bowels. The bowels also display a reddish discoloration. Note the pus collection on and between the entire length of the bowel.

Pantoea agglomerans rarely causes infections in humans compared to other species of the same genus or related families such as *Enterobacter*, *Klebsiella*, and *Serratia*. The typical infection pathway is from skin penetration by infected vegetation parts such as a thorn prick. In clinical settings, though rarely, transmission occurs through contaminated intravenous fluids, parenteral nutrition, or blood products. The most common infections that have been reported in humans are septic arthritis, endophthalmitis, periorbitis, endocarditis, and osteomyelitis (4). The growth and spread of *Pantoea agglomerans* is influenced by environmental factors such as adequate exposure to sunlight, quality air supply, as well as moisture (5). Few cases of *Pantoea*-related infections in adults have been reported to date. As previously described, patients with underlying immunosuppressive conditions, such as colon cancer and leukemia, are most commonly affected (6,7). In this case, the immune status of the patient was unknown, though his history of drug use is provocative.

The majority of *Pantoea* cases reported thus far have involved newborn infants and neonates (8). Even when the infection is diagnosed early and treated appropriately, *Pantoea agglomerans* related infections can progress to fulminant circulatory failure from septic shock, respiratory failure, thrombocytopenia, and pulmonary hemorrhage. Despite early detection mortality rates as high as 87.5% have been reported (8) due to the fact that though *Pantoea agglomerans* demonstrates sensitivity to most antibiotics *in vitro*, there has been less therapeutic success noted *in vivo*.

CONCLUSION

Pantoea-related infections are uncommon in humans, particularly in immunocompetent patients. In this case the final cause of death was septic shock and peritonitis. Prompt recognition of symptoms, a correct diagnosis, and timely management are paramount to ensure that a worsening of the condition and eventual loss of life

are prevented. This case highlights that amongst other potential bacterial causes; *Pantoea*-related infections should also be considered as a cause of peritonitis.

Correspondence: Dr. Herbert Mushumba, Institute of Legal Medicine, University Medical Center Hamburg- Eppendorf, Germany. Email: h.mushumba@uke.de

Potential Conflicts of Interest (CoI). All authors: no potential conflicts of interest disclosed.

Funding. All authors: no funding was disclosed.

Academic Integrity. All authors: confirm that they have made substantial academic contributions to this manuscript as defined by the ICMJE.

Ethics of human subject participation: The study was approved by the local Institutional Review Board. Informed consent was sought and gained where applicable.

Originality: All authors: this manuscript is original has not been published elsewhere

Type-editor: Haley Sessions (USA)

Review: This manuscript was peer-reviewed by * reviewers in a double-blind review process.

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