

Case report

Lethal complication in Pott's Puffy tumor: A case report

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ABSTRACT

A man in his fifties was found dead in his bed. Using postmortem CT, the frontal sinus wall was seen to have been destroyed and a subcutaneous / intra-cranial mass-like lesion was detected. Postmortem blood biochemical examination demonstrated high values of urea nitrogen, c-reactive protein, procalcitonin, and preprocalcitonin, which were thought to be due to sepsis. Needle aspiration showed reddish viscous fluid, and the presence of *Klebsiella oxytoca* was confirmed by culture inspection. Based on these results, Pott's puffy tumor with intracranial empyema, and dehydration with sepsis in the agonal period was assessed as the cause of death. Using autopsy evaluation, it was possible to come to a concrete conclusion, but a minimally invasive autopsy might be an alternative approach to investigate the cause of death.

1. Introduction

Paranasal sinusitis is a common disease, and using systemic antibiotic agents, the frequency of severe complications has been decreasing in decades [1]. When sinusitis is deteriorating, inflammation may lead to frontal bone sinusitis / osteomyelitis, and a rare complication, called Pott's puffy tumor [2,3], has been reported, which is a painful forehead soft tissue tumor. It may extend intracranially, resulting in a sub-periosteal abscess and subdural empyema [4–6]. Without suitable treatment, the subdural empyema may become the cause of death [7]. In this case report, we inspected the deceased body using postmortem CT without forensic autopsy, and evaluated the postmortem blood examination, from which the Pott's puffy tumor (and its related complications) was thought to be the cause of death.

2. Case

A man in his fifties lived by himself. His aunt, who lived nearby, visited his home. But she couldn't make contact with him, so that she decided to inspect his room with a police officer, and they found the deceased body lying in a supine position in bed. This was in mid-January (winter season) and the water, gas, and heating supply had been cut, so that the room temperature was 2 °C.

In his room, many nonsteroidal anti-inflammatory tablets were found, and many used tissue papers were discarded beside his pillow.

A summation of findings is presented in Table 1.

After bringing in the deceased body to our department, the whole body was evaluated by computed tomography (16-slice multi-detector CT scanner (Supria, Hitachi Corp., Tokyo). The scan parameters were as follows: 120 kV, 215 mA, 0.75 s/rotation, beam pitch 1.3125, collimation 1.25 × 16, slice thickness 5.0 mm).

2.1. Postmortem CT findings

A soft tissue mass was found at the right frontal sinus with osteolytic change at the inner- and outer- bone structure of the frontal sinus, and it showed expansile extension into the cranium of about 5 cm (Fig. 1). The osteolytic change was also found at the frontal skull base and reached into the sella turcica. The upper extension was about 5 cm from the frontal skull base, and the bilateral frontal cerebral lobe presented lower density change in deep white matter, estimated as edematous change. The mass margin was clear and smooth, and a lump was visible at his forehead. The mass extended into both orbits. The osteolytic change was found at the right inner bone structure, and the right inner straight muscle and optic nerve were compressed externally. The left inner bone structure was compressed by the mass lesion, and the left retro optic structures were compressed to the frontolateral side. The mass extended into the ethmoid sinus and right maxillary sinus, so that the mass border was not clearly distinguishable from membranous swelling. The inner density was inhomogeneous and calcified density

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Table 1
Deceased body appearance.

Height	166 cm
Weight	51.1 kg
Rigor mortis	spread to almost the whole body
Postmortem lividity	slight dark reddish at the rear, and the color disappeared with compression by tweezers
Cornea	medium turbidity
Body surface	no injury
Forehead	soft tissue tumor-like mass was palpable on the right forehead and bony structure was not palpable at the arcus superciliaris
Eye	open bilaterally, protrusion
Rectal temperature	about 30 °C (measurement at site of discovery)
Postmortem interval	about 12–24 h estimated



Fig. 1. Postmortem CT, multi-planar reconstruction, (a) soft tissue window (WL 40, WW 300), (b) bone window (WL 450, WW 1500), and (c) 3-dimensional reconstruction (volume rendering).

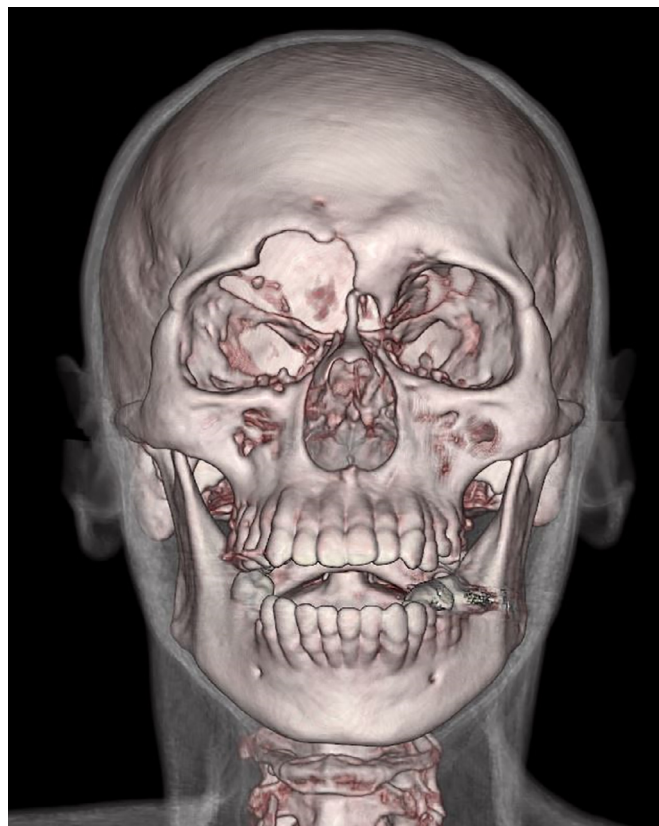


Fig. 1. (continued)



Fig. 2. Postmortem CT, lung.

was found (Fig. 1a, b).

The lung finding on postmortem CT presents no hypostasis in bilateral lung field, and the lung aerated area (minus 1000 to minus 700 HU) was calculated as about 94% (Fig. 2b).

Postmortem blood examination is presented in Table 2.

2.2. Lesion aspiration and culture inspection

The right forehead lesion was punctured using an 18-gauge spinal needle, and aspirated a red viscous liquid. No solid component was collected and an abscess was confirmed. The culture inspection confirmed *Klebsiella oytoca* infection.

According to the postmortem CT findings, the soft tissue mass was found at the right frontal sinus with osteolytic change at the skull bone, and a mass-like lesion was presented in the intracranium. In addition,

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