H59 A Case of Fulminant Spontaneous Necrotizing Soft Tissues Infections (NSTI) of the Chest Wall in a Man With No Risk Factors

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Learning Overview: After attending this presentation, attendees will be aware of the case of a patient with no risk factors who developed a mono-microbial spontaneous NSTI of the chest wall that was rapidly lethal.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by highlighting that NSTI of the chest wall, usually described in patients with pleural empyema or with a chest tube, can also occur spontaneously, in the absence of risk factors. Moreover, this presentation will impact the forensic science community by highlighting that a fulminant mono-microbial NSTI can occur in an immunocompetent patient.

NSTI refers to infection of any layer within the soft tissue compartment with associated necrotic changes.[1,2] It can be caused by different types of bacteria, including *Bacteroides, Streptococcus, E. coli,* and *Clostridium*—among many others.[3] The infections are usually polymicrobial, but may be monomicrobial in immunosuppressed patients. NSTI are most commonly described as occurring in the extremities, perineum (i.e., Fournier gangrene), abdomen, and head/neck.[4-6] Thoracic NSTI are extremely rare; the few cases reported in the international literature describe patients who have undergone thoracic surgery or had pleural empyemas.[7]

The case of a 67-year-old man who developed spontaneous NSTI of the chest wall following minimal muscle strain and in the absence of other risk factors is reported. He was admitted to the Emergency Room (ER) for moderate back pain radiating from the 3rd–4th right ribs. Clinical examination described a hematoma. He was discharged with prescribed painkillers but returned a few hours later for therapy-resistant pain. Clinical examination revealed edema of the right chest and right abdominal wall. A High-Resolution Computed Tomography (HRCT) scan showed right axillary lymphoadenopathy with imbibition of the soft tissue compartment of the right chest wall. Laboratory investigation revealed increased myocytolysis indicators. While the patient was initially afebrile with normal vital signs, his clinical condition deteriorated while being evaluated with worsening Glasgow coma scale (12), decreasing blood pressure (90/50mmHg), tachypnea (22bpm), and metabolic acidosis. Blood tests showed normal levels of white blood cells, acute kidney injury, and an increase of the non-specific inflammation indices. Septic shock was suspected. Broad spectrum antibiotic therapy was started with a concomitant norepinephrine infusion due to his fluid resuscitation-resistant hypovolemia. In a few hours, the clinical condition of the patient deteriorated significantly and he died (22 hours after first ER admittance) of refractory septic shock and multiorgan failure.

The prosecutor ordered a forensic autopsy that was performed 48 hours later. The main external findings were multiple large reddish areas on the right hemithorax that spread down the right side and to the right gluteus with de-epithelialized areas. Histologic examination of the organs revealed widespread necrosis of the soft tissues and muscle fibers of the right hemithorax, buttocks, right flank, and pectoral region. The cause of death was certified as septic shock. Postmortem Matrix-Assisted Laser Desorption/Ionization-Time-of-Flight (MALDI/TOF) mass spectrometry identified *Streptococcus pyogenes* as the cause of the NSTI. This finding was interesting because *Streptococcus pyogenes* is a typical cutaneous bacteria that rarely causes mono-microbial NSTI in the absence of a cutaneous lesion or in immunocompetent patients with no risk factors.

Reference(s):

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NSTI, Spontaneous Infection, Streptococcus Pyogenes