H94 Medicolegal Issues in Lethal Necrotizing Fasciitis: Presentation of a Case Series

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After attending this presentation, attendees will better understand the clinical and postmortem features of Necrotizing Fasciitis (NF) and its implications on medical malpractice and liability.

This presentation will impact the forensic science community by providing a broad and thorough review of the current literature and scientific knowledge about NF, with emphasis on key issues of interest to the medicolegal investigator and forensic pathologist.

NF is a rare but severe infection of the soft tissues, usually related to a bacterial invasion of the fascia, quickly spreading to muscles, subcutaneous fat, and to the overlying skin. The forensic pathologist often encounters NF in cases of alleged clinical malpractice because the infection usually leads to a rapid death in apparently healthy subjects with no obvious clinical diagnosis.

Here a series of five cases (aged 30 years—50 years old) involving death due to NF are presented. In all of the reported cases, patients presented to the Emergency Room (ER) with symptoms of pain, sometimes associated with mild fever (three cases). In three cases, a previous trauma was reported in the anamnesis. Predisposing factors for NF, such as myelodysplastic syndrome, obesity, and liver cirrhosis, were observed in only two cases. Imaging studies (plain radiographies in three cases and Computed Tomography (CT) scan in two cases) were performed on the areas affected by pain and revealed a thickening of soft tissues only in two cases. Two cases were discharged after their first medical consult. In all of the reported cases, signs of local phlogosis, such as hemorrhagic suffusion of soft tissues, lesions on the skin, and bullae were absent at admission in the ER and appeared only later and concurrently to the diagnosis of septic shock. When systemic involvement was observed, basic blood tests such as basic biochemical analyses, complete blood count, and, in two cases, C-reactive protein tests were performed. In only one case was an antemortem clinical diagnosis of NF reached.

In all the reported cases, a forensic autopsy was performed. A necroscopic examination was performed, detecting in all of the cases reported signs of local phlogosis, such as violaceus, swollen and tender skin with crepitus at external inspection, and signs of necrosis, such as grayish-colored fascia and diffuse hemorrhagic infiltration of the muscular tissue during dissection. The histopathologic examination of such tissues displayed necrosis, diffused angiothrombosis with interstitial infiltration of granulocytes, and intramuscular colonies of bacteria. Microbiological analysis detected *Streptococcus pyogenes* in three cases, *Staphylococcus aureus* in one case, and *Staphylococcus aureus* plus *Escherichia coli* in one case.

More than half of patients developing NF have a pre-existing medical condition and the portal of entry of microorganisms is usually a post-traumatic discontinuation of the skin and the soft tissues above the fascia; however, as observed in this case series, sometimes NF occurs in apparently healthy subjects who have no previous history of trauma.[1-4]

A diagnosis of NF may take advantage of a detailed clinical evaluation, laboratory diagnostic parameters, and radiological investigations.[5-9] An early diagnosis of NF allows for a timely surgical therapy, which is usually the strongest predictor for a better patient outcome; however, a prompt clinical diagnosis of NF is usually difficult or even unfeasible because of the non-specificity of symptoms at the time of presentation.[10]

In the case series discussed, the presenting symptoms were vague and more specific signs of NF (hemorrhagic suffusion of the skin) appeared later and concurrently to septic shock, leading to a rapid death. In the absence of a clinical diagnosis, radiological data and laboratory diagnostic tools were not requested by the physicians. Moreover, in one case, the diagnosis of NF was made only through emergent surgical exploration. On these grounds, the most important diagnostic issue remains a high index of clinical suspicion which is essential for the formulation of a timely clinical suspect of NF; however, this can be a complex and difficult task because presentation symptoms are extremely vague and NF is infrequent (usually practitioners encounter one or two cases in their entire careers).[11]

Even if a prompt and correct therapy (broad spectrum antibiotic therapy, aggressive surgical debridement of necrotic tissue with limb amputations) is performed in a timely manner, NF cases may pose medical malpractice disputes because of its possible fatal outcome in otherwise young and healthy people.

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Forensic Pathology, Necrotizing Fasciitis, Medical Malpractice