Unusual Cause of Disseminated Necrotizing Infection of the Abdominal Wall and Viscera

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Abstract

It is uncommon for necrotizing fascitis of the abdominal wall to present in a disseminated manner, extending to most of the intra abdominal viscera. It is also uncommon for the causative organism to be fungus. Usually, it is either monomicrobial or polymicrobial cause. The usual presentation of this disease entity is changes in skin color from red-purple to patches of blue-gray associated with deeper tissues involvement namely fascia and muscles without involvement of abdominal viscera, associated with picture of toxemia and septic shock. Special staining should be used to identify fungal infestation. This could be the first case reported in the literature among young patients. High index of suspicion and early administration of anti-fungal therapy is needed in unusual presentation of necrotizing infection in young healthy patient.

Introduction

Disseminated necrotizing infection secondary fungal infection is extremely rare. This case describes a patient with very aggressive necrosis of the abdominal wall the intraabdominal viscera. The provisional diagnosis was necrotizing fascitis (NF) secondary to bacterial infection, which was thought to be limited to the abdominal wall, but it turned to involving the whole abdominal wall and extending to the most of the intraabdominal organs. Histopathology report revealed disseminated fungal infestation causing tissue necrosis. The patient underwent extensive but damage control procedure. Despite aggressive supportive care and broad antibiotic therapy, patient expired 12 hours postoperatively.

Necrotizing soft tissue infection is a rare but potentially fatal infection involving skin, subcutaneous tissue and muscle [1]. Typically, it begins minor trauma, as simple as simple contusion, minor burn, or insect bite. The disease occurs more frequently in diabetics, alcoholics, immunosuppressed patients, intravenous drug users, and patients with peripheral vascular disease [2]. It is commonly associated with systemic inflammatory response syndrome (SIRS) and septic shock. Patients need aggressive debridement and prolonged intensive care support [3,4]. Necrotizing fasciitis is characterized by widespread necrosis of the subcutaneous tissue and fasciae. However, it can involve deep fascia and muscle [5]. Although it can occur in any region of the body, abdominal wall, perineum and extremities are the most common sites [6]. The disease progresses rapidly and it is usually caused by polymicrobial symbiosis and synergy [1,4]. Monomicrobial infection usually affects immunocompromised patients (e.g. patients with cancer, diabetes mellitus, vascular insufficiencies or organ transplantation) [7]. Many aerobic and anaerobic pathogens may be involved, including but not limited to bacteroides, clostridium, peptostreptococcus, enterobacteriaceae and pseudomonas. Group A hemolytic streptococcus and staphylococcus aureus, alone or in synergism, are the initiating infecting bacteria [8]. Fungal infection although reported, is not a common finding in necrotizing fasciitis; only a handful of case reports are available in literature and mainly in pediatric patients or elderly [9,10].

Treatments include rapid radical debridement and administration of appropriate antibiotics. However, even with proper treatment, the mortality rate remains as high as 53% [11]. Because NF is a surgical emergency and a life-threatening condition, Aggressive resuscitation, broad antibiotic administration, intensive care unit (ICU) admission, and immediate surgical debridement are warranted [12].
Case Presentation

A 35-year-old gentleman referred from another hospital as case of acute renal failure. The patient has only history of hiccup for 4 days and noticed a small grayish-blue area in umbilical region, which increased in size with time to reach about 25 cm in maximum diameter and associated with pain and firmness of the skin. The patient has unremarkable medical and surgical history, and has no allergy to any medication.

On arrival to our institution, the patient was in septic shock on inotropic support but conscious and communicating well. Abdominal examination revealed a large blackish area about 25 to 30 centimeter (cm) extending from the epigastric area down to 2 cm below the umbilicus (Figure 1). Abdomen was distended, very tender and rectal examination revealed altered blood. Laboratory workup showed leukocytosis and acute renal and hepatic failure. Radiographic investigation including ultrasound (US) and computerized tomography (CT) scan of the abdomen revealed fat stranding in the abdominal wall and mesentery with free fluid.

The patient was immediately transferred to the operating room with a working diagnosis of necrotizing fasciitis of the abdominal wall. Extensive abdominal wall necrosis involving skin subcutaneous fat fascia and muscles was apparent but without pus collection and no bad odor, which is usually associated with this disease. Upon entering the abdominal cavity, it became clear that there is patchy necrosis of many organs including omentum, stomach, small and large intestine, and gallbladder (Figure 2). Limited resection of the dead parts was carried out. There was evidence of retroperitoneal necrosis too. Patient was transferred to ICU in unstable condition and planned for second look next day.

Histopathology report showed non-suppurative necrosis with fungal invasion, which was variable in size, non-separated hyphae with 90-degree branching consisting with phycomycosis and vascular invasion is noticed (Figure 3 and 4).

Discussion

Subcutaneous phycomycosis was first described in Indonesia in 1956 [13]. It is a saprophytic fungus present in soil, decaying fruit and vegetable matter as well as in the gut of amphibians and reptiles. It can cause a variety of clinical manifestations including subcutaneous zygomycosis, gastrointestinal zygomycosis and occasionally an acute systemic illness. Subcutaneous zygomycosis is the commonest presentation reported from many tropical countries including India [14].

Histopathologically it is a granulomatous infection of the skin and subcutaneous tissues characterized by the formation of firm and non-tender swellings, generally on extremities, trunk and rarely other parts of the body [15]. The disease usually occurs in children, less often in adolescents and rarely in adults. Males are much more frequently affected than females [15]. In our study, the patient was a healthy adult who developed a firm mildly painful bluish nodule over the...
abdominal wall, which was rapidly progressive over a period of 4 days complicated by intraabdominal involvement and multi-organ failure. Most patients with phycomycosis respond very well to oral potassium iodide therapy as well as azoles family particularly itraconazole [14]. This patient was in critical condition postoperatively and he expired in less than 12 hours from presentation. Starting anti-fungal therapy early could have changed the outcome. In the absence of classical features of necrotizing fasciitis in health patient, high index of suspicion is warranted to start anti-fungal therapy empirically as early as possible.

References