

# Retroperitoneal Necrotizing Soft Tissue Infection in a Healthy Adult Masquerading as Acute Pancreatitis

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Received: 23 Dec. 2015; Accepted: 14 Jun. 2016

**Abstract-** Necrotizing soft tissue infections (NSTIs) are polymicrobial infections with high morbidity and mortality. We report a case of retroperitoneal NSTI in an immunocompetent young male, with clinical symptoms and signs mimicking acute pancreatitis (pseudo-Cullen's and pseudo-Grey-Turner's signs). The initiating lesion was a pustule which progressed and mimics acute pancreatitis. CT scan showed features of retroperitoneal NSTI. After extensive debridement and antibiotics, the patient improved. NSTI of the retroperitoneum is rare. The absence of external clinical signs and anatomical barriers make the disease difficult to manage.

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*Acta Med Iran* 2017;55(1):74-76.

**Keywords:** Acute pain; Infection; Acute pancreatitis

## Introduction

Necrotizing soft tissue infections (NSTIs) are not uncommon, but underreported. They remain a diagnostic and therapeutic challenge to the surgeon, due to variable clinical manifestations, delay in diagnosis, high virulence of organisms, and, a high morbidity and mortality. Mortality can be as high as 20% to 40% (1). Early diagnosis and radical surgical treatment are helpful in reducing the mortality. 'Hard signs' of NSTI are accurate for diagnosis but appear later in the course of the illness (2).

NSTI of the retroperitoneal space is rare and potentially lethal. It is mostly associated with comorbidities. The absence of external clinical signs and the presence of anatomical fascial barriers lead to a delay in diagnosis. Atypical gastrointestinal and urinary symptoms may cause confusion with other diagnoses like acute abdomen or urosepsis (3,4).

We present the case of a young man with retroperitoneal NSTI who was admitted with a diagnosis of acute abdomen; however, the subsequent course and management were unusual. The challenges faced in the management along with the plausible pathogenesis of the illness are discussed.

## Case Report

A 21-year-old male presented with a 2-day history of

abdominal pain and distension, vomiting, high-grade fever, and, lassitude. There was a history of a pustule in the right gluteal region over the past week, for which the patient was taking oral cloxacillin prescribed by a family physician. No significant history of any systemic illness, substance abuse, prolonged drug treatment, or, discoloration over the gluteal lesion was elicitable. On examination, Pulse-112/minute; with hypotension (SBP=86 mmHg); RR=28/minute; and, Temperature-101.2° F. Abdominal examination revealed distension with generalized tenderness, guarding, sluggish bowel sounds, and free fluid. A sharply demarcated, reddish discoloration of skin was seen around the umbilicus and bilateral flanks (Figure 1).

Perineal examination revealed a ruptured pustule in the right gluteal area with discharge and maceration of the surrounding skin (around 2 cm in diameter). There were no 'hard signs' like induration, discoloration, bullae, and crepitus. With a provisional diagnosis of acute pancreatitis or peritonitis secondary to perforation of a hollow viscus, the patient was admitted to the emergency ward and resuscitated. Laboratory investigations revealed a white blood cell count: 17500/mm<sup>3</sup>, and Hgb: 10.5 gm/dL. Serological tests for HIV and HBV infection were negative.

The abdominal radiograph was normal. Ultrasound revealed a minimum amount of free fluid in the abdomen with a normal pancreas; on diagnostic aspiration, the fluid was straw-coloured and pauci-

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cellular. Conservative management was started with a provisional diagnosis of mild acute pancreatitis, with a plan for subsequent imaging. Worsening systemic symptoms prompted a CT scan 24 hours later, which revealed streaks of air in fat planes between descending colon and urinary bladder with free gas in a few areas, and heterodensities in the retroperitoneal fat. These findings were suggestive of necrotizing soft tissue infection of the retroperitoneum (Figure 2).



**Figure 1.** Erythema around umbilicus and bilateral flanks ('pseudo-Cullen's and pseudo-Grey Turner's signs)



**Figure 2.** Cross-sectional contrast-enhanced CT scan of the pelvis with a thin arrow depicting free gas in the retroperitoneum, and, thick arrow depicting gas in fat planes between bladder and colon

The diagnosis was revised to retroperitoneal NSTI; the possible initiating site was a gluteal pustule. Empirical broad-spectrum antibiotic therapy with ampicillin/sulbactam, metronidazole, and amikacin was started. The patient was prepared for exploration of the gluteal wound and 50 ml of extra-peritoneal toxic fluid was released. Operative findings were crepitus in the soft tissue, with extensive slough and necrosis of the fascia extending till the lower abdomen and flanks. Wide local debridement was done. Pus culture revealed *Escherichia coli* sp. sensitive to Meropenem and Teicoplanin. Parenteral Meropenem therapy was administered for two weeks, according to the established

guidelines for severe systemic infections. The patient's wound was managed with repeated minor debridements and twice-daily dressings. The wound healed satisfactorily, and split-thickness grafting was performed after 3 weeks. The patient is well after 6 months of follow-up.

## Discussion

Retroperitoneal NSTI is an uncommon condition. Mortality rate as high as 37% has been reported when adequate debridement is delayed. The management is hampered due to the difficult anatomy and late diagnosis (3). Early and repeated surgical debridement of all affected tissues is the treatment of choice with broad-spectrum antibiotics (3,4).

The primary event includes pericolic or perirectal sepsis with subsequent spread to retroperitoneal space. Vascular thrombosis which occurs early leads to secondary ischemic and infective changes in the overlying skin and subcutaneous tissues giving rise to a typical appearance of a retroperitoneal NSTI (3). With significant comorbid conditions viz. diabetes, chronic liver disease or HIV, the disease is almost always fatal. Our patient was a young, immunocompetent adult (3-6).

The initial presentation in our patient mimicked several features of acute abdomen. There was peri-umbilical and bilateral flank erythema similar in appearance to the signs classically described for hemorrhagic pancreatitis and retroperitoneal hemorrhage. Cullen's sign is described as peri-umbilical ecchymosis which is due to communication of retroperitoneal space with anterior abdominal wall superiorly along falciform ligament to the umbilicus and inferiorly along the median and medial ligaments. Grey Turner's sign is flank ecchymosis due to defects in the quadratus lumborum muscle and into the subcutaneous tissue (6,7). It has been postulated that retroperitoneal inflammation and exudates spread in a similar fashion causing the unique pattern of erythema (4). Despite the plausible pathogenesis of this sign by retroperitoneal inflammation, it has been scantily reported. In all perineal and gluteal infections with virulent organisms and systemic signs, we should keep a high index of suspicion for the deeper spread.

The CT findings of NSTI are soft-tissue air associated with fluid collections within the deep fascia along with thickening and enhancement of one or both of the superficial and deep fascial layers. The subcutaneous fat may be similarly affected (7).

## Retroperitoneal necrotizing soft tissue infection

Liquefactive tissue necrosis and inflammatory edema both create a fascial fluid that is detected by T2-weighted MR imaging as abnormally increased signal intensity on T2-weighted images, and, variably increased signal intensity on T1-weighted images along thickened deep fascial planes. Gas bubbles, if present, appear as focal signal voids on both T1- and T2-weighted images. Since both infected necrotic tissue and non-infected edematous tissue have a similar appearance on MR images, the extent of infection may be overestimated (4,8). Thus we considered CT scan as an appropriate investigation for retroperitoneal NSTI, especially as we wanted to rule out other intra-abdominal pathology. Probably, classical changes appear late in the course of the illness.

Early radical debridement of all affected tissues is curative, with appropriate antibiotic therapy essential to complete the treatment. Relook laparotomy after 24-48 hrs is advocated, if the patient is not improving. The antibiotic therapy at an early stage prevents the amount of tissue destruction. NSTIs are usually polymicrobial (3,4,9).

Small untreated peripheral infections, even in immunocompetent individuals, may lead to destructive NSTIs. Clinicians should not miss subtle signs of systemic spread and perform aggressive debridement once deeper spread has occurred.

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