Pancreatic Panniculitis Associated with Periampullary Duodenal Diverticulum: A Case Report

Tirnanic Tanja*, Radevic Tatjana, Dordevic Andrea, Petrov Nenad and Mijuskovic Zeljko

Department of Dermatology and Venereology, School of Medicine, Belgrade, Serbia

Corresponding Author*

Tirnanic Tanja
Department of Dermatology and Venereology,
Military Medical Academy,
Belgrade, Serbia
Email: storebarce@gmail.com

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Abstract

Pancreatic panniculitis is a rare type of lobular panniculitis that manifests as painful erythematous nodules on the skin of the lower extremities. Subcutaneous fat necrosis caused by the release of pancreatic enzymes is the underlying cause of the disease, affecting around 2% to 3% of patients with pancreatic diseases.

We present a case of a 58-year-old male patient who exhibited painful erythematous nodules on the lower extremities and trunk. Laboratory results revealed increased levels of pancreatic enzymes, amylase and lipase, as well as heightened levels of glucose and inflammation markers. The histological analysis of the skin lesion biopsy revealed the presence of predominantly lobular panniculitis in the hypodermis, areas of fatty tissue necrosis/saponification and remnants of adipocytes (ghost cells). Abdominal CT scan demonstrated periampullary diverticulum of the duodenum, with no signs of pancreatitis or other pancreatic abnormalities. Esophagogastroduodenoscopy showed a wide opening of the periampullary diverticulum in the D2 segment of the duodenum. The patient was successfully treated with pancreatin therapy, resulting in a significant reduction of skin lesions and decreased levels of pancreatic enzymes.

Pancreatic panniculitis can be caused by periampullary duodenal diverticula that exert pressure on the pancreatic duct, leading to elevated levels of pancreatic enzymes. Symptomatic duodenal diverticula may be treated with operative or non-operative measures, depending on the individual characteristics of the patient. Treatment of pancreatic panniculitis primarily involves addressing any underlying medical condition.

Keywords: Pancreatic panniculitis • Periampullary diverticulum • Pancreatic enzymes • Pancreatin therapy

Introduction

Pancreatic panniculitis is a skin condition that affects a small percentage (2%-3%) of individuals with pancreatic diseases. While the exact cause is unknown, some studies suggest that pancreatic enzymes may trigger the condition by releasing fatty acids from the fat beneath the skin, leading to fat necrosis [1].

Pancreatic panniculitis can be linked to several pancreatic conditions, such as acute and chronic pancreatitis, pancreatic tumors and cysts.

The skin symptoms can occur before, during or after the development of pancreatic disease.

The condition typically presents as painful, red nodules beneath the skin, mostly observed on the lower legs, although other body areas can also be affected. In more severe cases, the symptoms can lead to skin ulcers and other complications [2].

Case Presentation

A male patient, aged 58, was hospitalized in our clinic due to the presence of painful erythematous nodules on his lower extremities and trunk, persisting for a period of two months. The patient did not exhibit any constitutional symptoms. Initial treatment with systemic antibiotics on an outpatient basis did not yield a therapeutic response.

In his personal medical history, patient reported that he suffered from acute pancreatitis in 2011. Patient also reported cigarette smoking with no previous history of alcohol consumption [3].

During physical examination, numerous subcutaneous nodules, measuring 1.5 cm-4 cm in diameter, displaying erythematous coloration and fluctuation, were observed primarily on the lower legs, thighs, and trunk (Figure 1). Additionally, mild oedema of both feet and ankles was present and the patient's abdomen was found to be soft and nontender [4].

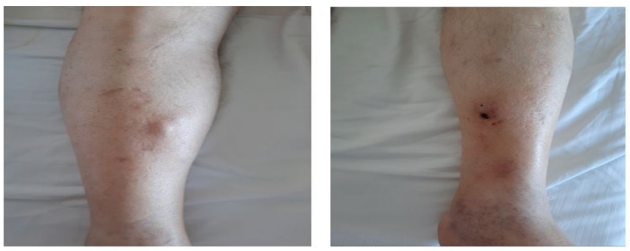

Figure 1. Multiple fluctuant erythematous subcutaneous nodules measuring 1.5 cm-4 cm in diameter on both lower legs and tights.

He didn't report abdominal pain, nausea, vomiting or any other gastrointestinal symptom. Abnormal laboratory findings showed increased sedimentation rate (106 mm/h, <20 mm/h), increased leucocyte count (14.47 × 10^9/L, ref. range 4-10 × 10^9/L), increased levels of C-reactive protein (280.57 mg/L, <5 mg/L), glucose (10.5 mmol/L, <5.9 mmol/L), urea (13.1 mmol/L, <7.5 mmol/L), creatinine (139 umol/L, <88 mmol/L), amylase (133 U/L, <115 mmol/L), lipase (1041 U/L, <393 mmol/L), alpha1 antitrypsine (2.88 g/L, <2 g/L) and decreased levels of Fe (3 umol/l, >8 umol/L), erythrocytes (3.68 × 10^{12} /L, >4.5 × 10^{12} /L) and hemoglobin (101 g/L, >130 g/L). Serum tumor marker levels CEA, CA 19.9 and AFP were within the reference range. Immunologic analyses: ANA, C3, C4, ENA screening, cANCA, pANCA, cryoglobulins and circulating immune complexes were undetectable [5].

Systemic antibiotic therapy was started (intravenous metronidazole and meropenem for 7 days), topical corticosteroids (betamethasone dipropionate 0.05%) two times a day for skin lesions along with bed rest and leg elevation [6].

The histological analysis of the skin lesion biopsy revealed the presence of predominantly lobular panniculitis in the hypodermis, characterized by a mixed inflammatory infiltrate, areas of fatty tissue necrosis/saponification and remnants of adipocytes (ghost cells) (Figure 2). Granuloma formation or atypical cells were not observed, and the

pathological findings were consistent with subcutaneous nodular fat necrosis.

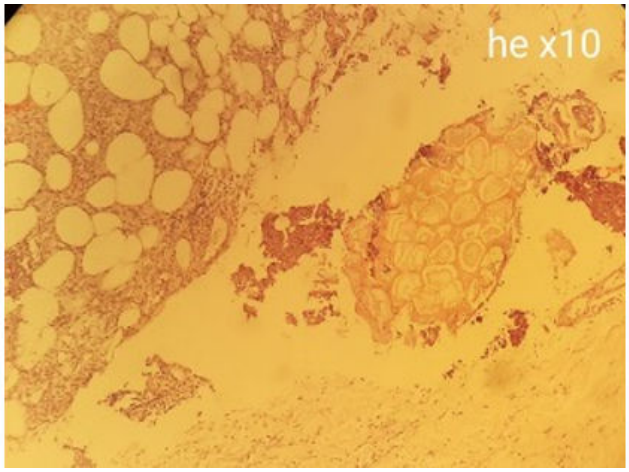

Figure 2. Predominantly lobular panniculitis with ghost-cells, necrotic adipocytes with amorphous granular debris.

The culture of skin tissue sample showed no presence of deep fungal infection or acid resistant bacteria. Additional diagnostic procedures were done. Abdominal ultrasound showed signs of liver steatosis. Computed Tomography (CT of chest, abdomen and pelvis demonstrated periampullary diverticulum of the duodenum, adjacent to the pancreatic head. CT scans showed no signs of pancreatitis, pancreatic neoplasm or any other pancreatic disease. Esophagogastroduodenoscopy showed a wide opening of the periampullary diverticulum in D2 segment of duodenum [7].

Gastroenterologist was consulted and pancreatin 10000 IU three times a day was started. Ten days after starting pancreatin therapy, there was a significant reduction of skin lesions, along with decreasing levels of pancreatic enzymes (amilase 129 U/L, lipase 120 U/L (Figure 3.

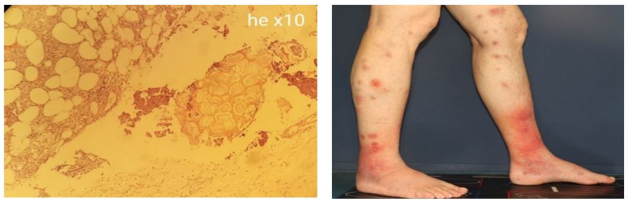

Figure 3. Initial regression of skin lesions.

Results and Discussion

Pancreatic panniculitis is an infrequent disorder that occurs when pancreatic enzymes are released in large quantities into the bloodstream, leading to the development of subcutaneous nodules and necrosis of the fatty tissue. This condition is an uncommon complication of pancreatic diseases, often observed in cases of acute or chronic pancreatitis, pancreatic carcinoma (specifically the acinar cell variant and less frequently in conjunction with pancreatic pseudocysts and pancreas divisum. Nevertheless, there have been documented cases of its occurrence linked to various other diseases and conditions like HIV infection, haemophagocytic syndrome, diabetic ketoacidosis, sepsis, liver carcinoma and systemic lupus erythematosus. To the best of our knowledge, this case report presents the first documented instance of pancreatic panniculitis associated with a periampullary duodenal diverticulum [8].

Due to its clinical presentation, pancreatic panniculitis may have similarities with other types of septal and lobular panniculitis (erythema nodosum, erythema induratum, lupus panniculitis, etc.). Therefore, it is crucial to conduct various diagnostic procedures, placing particular emphasis on performing a biopsy of skin lesions and submission of the sample for thorough histological and microbiological analysis. In the initial stages, early skin lesions may exhibit septal panniculitis without fat necrosis, whereas fully developed lesions display distinct saponification and ghost cells, which represent remnants of adipocytes with amorphous granular debris.

The presumed mechanism behind the development of skin lesions, involves trypsin increasing the permeability of blood vessels in the tissue, which allows lipase to enter the subcutaneous tissue and break down fatty acids [9].

Elevated serum levels of amylase, lipase and trypsin are often observed in pancreatic panniculitis, athough the presence of elevated levels of single enzyme without concurrent elevation in others is not uncommon. The development and severity of panniculitis do not necessarily correlate with enzyme levels. In some cases, patient may display elevated levels of serum lipase without any clinical or radiologic evidence of pancreatitis or other pancreatic diseases.

In this particular case, laboratory analyses revealed a 2,6-fold increase in serum lipase levels (1043 U/L, normal <393 with slightly increased levels of amylase (133 U/L, normal <115. Abdominal Computed Tomography (CT indicated the presence of periampullary duodenal diverticulum with no signs of pancreatitis or other pancreatic diseases. The patient did not report any constistutional or gastrointestinal symptoms at presentation.

Periampullary diverticula refer to sac-like expansions in the mucosal lining situated near the ampulla of Vater. It is worth noting that approximately 70%-75% of duodenal diverticula are classified as periampullary. There have been reports linking periampullary diverticula with acute and chronic pancreatitis. Complications arising from these diverticula can occur when they exert pressure on the duodenal wall, common bile duct or pancreatic duct, potentially leading to pancreatitis [10].

In the case presented, it is possible that distension of a diverticulum caused compression of the pancreatic duct, resulting in an asymptomatic increase in pancreatic enzymes and subsequent pancreatic panniculitis. Furthermore, elevated pancreatic enzymes were observed despite the absence of clinical examination or CT scan findings indicative of pancreatitis (CT scans have a sensitivity of approximately 92% for detecting pancreatitis. Notably, the patient had experienced an episode of acute pancreatitis ten years prior, which may have been related to the same underlying cause. In 40% of cases, lesions of pancreatic panniculitis can appear before the onset of pancreatic disease, with a time interval ranging from 1 to 7 months, thereby serving as a significant diagnostic indicator.

The primary approach to treating pancreatic panniculitis involves addressing the underlying pancreatic disease. In cases associated with acute pancreatitis, resolution of skin lesions is typically seen with the normalization of pancreatic enzymes. Nevertheless, in cases associated with neoplasia, the pancreatic panniculitis tends to exhibit a chronic and persistent nature. The use of octreotide, a somatostatin analogue, could potentially offer advantages in the treatment of individuals diagnosed with pancreatic panniculitis.

Symptomatic duodenal diverticula can be managed through operative or non-operative measures, with surgical intervention reserved for complicated cases. In the presented case, symptomatic treatment led to initial regression of skin changes and a decrease in pancreatic enzyme levels.

Conclusion

This report emphasizes the uncommon occurrence of pancreatic panniculitis and its association with multiple diseases. Despite the absence of pancreatitis or other pancreatic abnormalities on imaging, the patient's history of acute pancreatitis and the presence of a periampullary diverticulum suggest a possible connection to the development of pancreatic panniculitis.

The successful treatment with pancreatin further supports this hypothesis. In conclusion, diagnosing pancreatic panniculitis involves assessing pancreatic enzyme l evels and performing a skin biopsy.

Pancreatic panniculitis can be associated with various pancreatic disorders and other conditions, necessitating the exclusion of underlying diseases in order to effectively manage both the primary disease and cutaneous manifestations.

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