

Acute pancreatitis possibly caused by allergy to bananas

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Summary. We are reporting a forty-seven year old female who had three attacks of acute pancreatitis after having eaten bananas. She was treated with a light diet and intravenous fluids during each of her admissions. The treatment concluded with the disappearance of clinical symptoms such as epigastralgia, nausea, vomiting and diarrhea within a few days. In addition, elevated serum and urine amylase levels returned to normal values in parallel with the clinical symptoms. The data during her three attacks of acute pancreatitis were as follows: serum total IgE level = 644 IU/mL, specific IgE to bananas = 2.18 UA/ml. No remarkable abnormalities were present in sonography, computed tomography, magnetic resonance imaging of the abdomen, and magnetic resonance cholangiopancreatography. Endoscopic examination of the upper digestive tract showed the ampulla of Vater swollen and edematous, thus a biopsy was performed. Toluidine blue staining and immunohistochemical staining against human mast cell tryptase with the biopsy specimens showed mast cells accumulating in mucosa and submucosa. By avoiding consumption of bananas, she has not suffered from any additional attacks of pancreatitis since the third attack in the last thirty-four months up to this day of December 10, 2004.

Key words: acute pancreatitis, food allergy, banana, mast cell.

Introduction

Allergy has been known as the cause of acute pancreatitis ever since 1933 when Couvelaire and Bargeton [1] reproduced a case of acute pancreatitis in dogs following experimental anaphylactic shocks. Acute pancreatitis associated with food allergy is extremely rare [2-7]; moreover, there are no case reports suggesting a possible mechanism of acute pancreatitis due to food allergy. In our article we report the first potential case of acute pancreatitis caused by allergy to bananas. Furthermore, we have investigated into a possible mechanism in the case.

Clinical case

In September 2001, a forty-seven-year-old female with a past history of allergic rhinitis due to Japanese cedar suddenly suffered from epigastralgia, nausea,

vomiting, and diarrhea after lunch. She has no alcohol or drug problems. Physical examination revealed that her abdomen was hurting on deep palpation in the epigastrium, without signs of peritoneal irritation. The laboratory data of peripheral blood leukocytes was 8500/mm³. Serum and urine amylase levels were elevated (945 U/I and 4620 U/I). Serum lipase and serum elastase-1 levels were also elevated (1893 U/I and 2431 ng/dl). No remarkable abnormalities were present on sonography and computed tomography (CT) of the abdomen. The patient was admitted to our hospital where she was treated with a light diet and intravenous fluids. She was discharged on her eighth day with a diagnosis of acute mild pancreatitis. On the twelfth day after discharge, during lunch she experienced the same clinical symptoms and was readmitted to our hospital. Peripheral blood leukocytes showed 5100/mm³ with 5.8% eosinophils. Serum and urine amylase levels were 946 U/I and 11693 U/I respectively. Pancreatic function diagnostant (PFD) (Sanko Junyaku, Tokyo, Japan) test [8], which is useful in detecting decreases in pancreatic

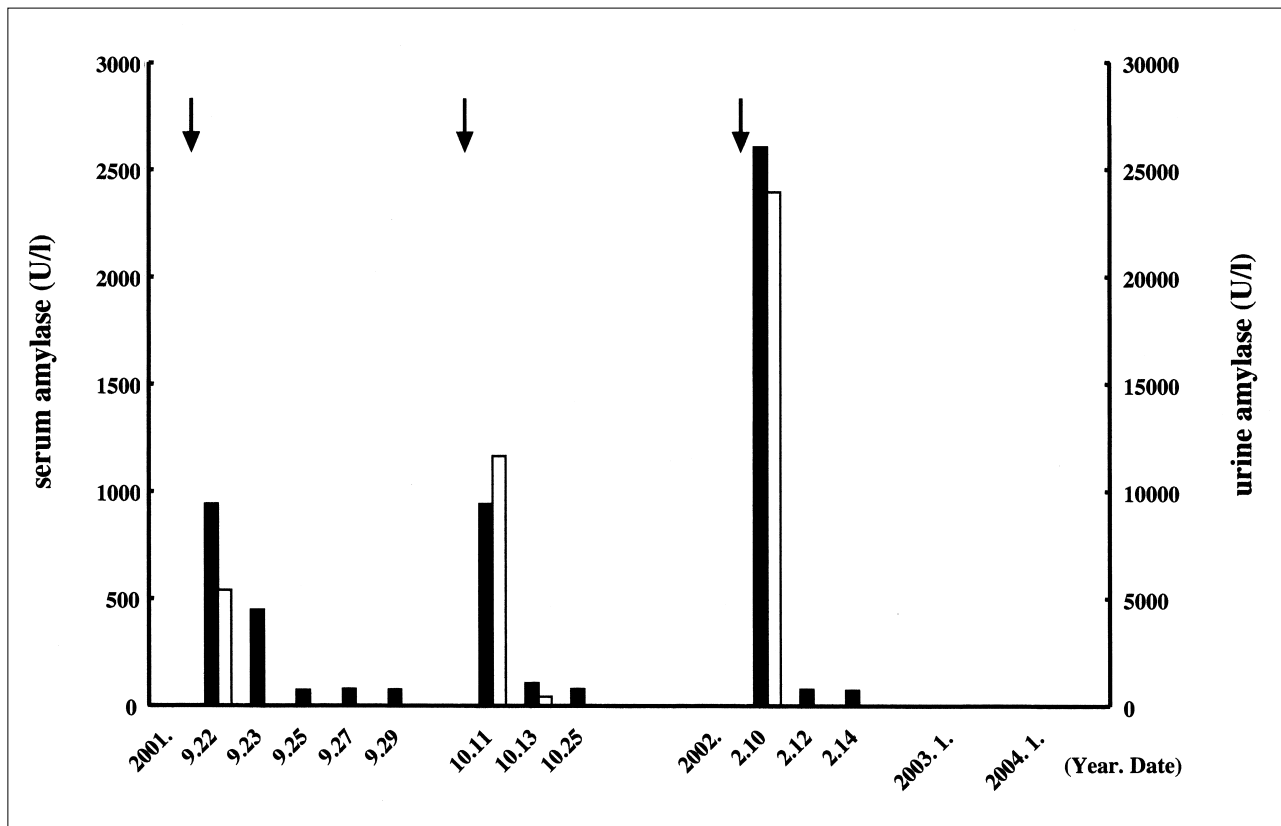


Figure 1. Serial clinical course of the case. Closed columns show serum amylase levels and open columns show urine amylase levels respectively. The patient had three attacks of acute pancreatitis after having eaten bananas (arrows).

exocrine functions, was well within normal range. Antinuclear antibody and LE test were both negative. Those data indicated that acute exacerbation of chronic pancreatitis or autoimmune pancreatitis was not involved in this case. Two days later, serum amylase level fell to

111 U/l. Abdominal pain declined after 24 hours with a diet and the patient was discharged. The patient suffered from another attack with similar symptoms suddenly after having supper in February 2002. Peripheral blood leukocytes showed $12900/\text{mm}^3$, and serum and urine

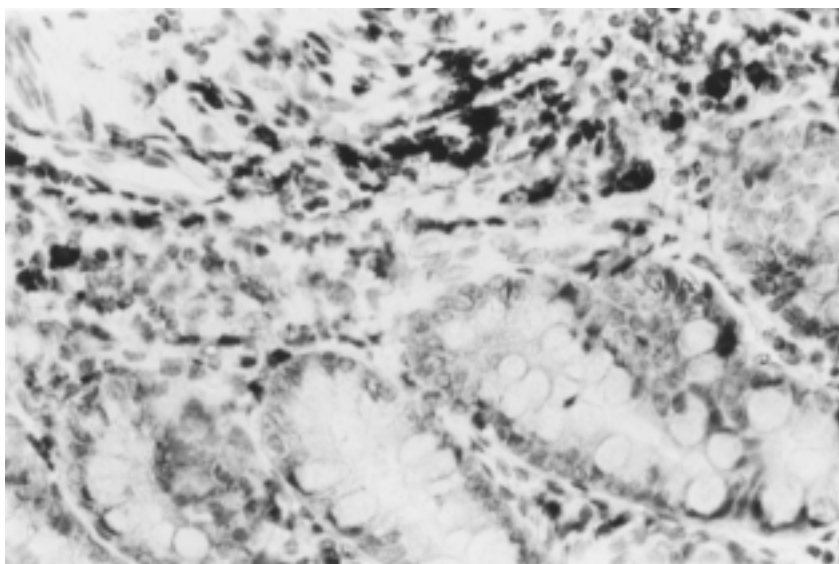


Figure 2. Immunohistochemical staining of human mast cell tryptase with the biopsy specimen from the ampulla of Vater. Accumulation of mast cells is seen in mucosa and submucosa (magnification x400).

amylase levels were 2609 U/I and 23991 U/I respectively. No steatorrhea were found. No remarkable abnormalities were present in sonography, CT, magnetic resonance image (MRI) of the abdomen, or magnetic resonance cholangiopancreatography (MRCP).

Figure 1 shows a serial clinical course of this case. This patient had three attacks of acute pancreatitis after eating a banana each time. Each attack of upper abdominal pain was accompanied by migraine and pruritis in the 2 hours following banana consumption. After each admission, the clinical symptoms disappeared within a few days with a light diet and intravenous fluids in parallel with the normalization of amylase levels. Serum total IgE level was 644 IU/ml. Specific IgE to bananas was 2.18 UA/ml (CAP system, Pharmacia, Uppsala, Sweden). Cutaneous tests for food antigens were not performed because the antigens were not available. Endoscopic examination of the upper digestive tract showed that the ampulla of Vater was swollen and edematous, thus a biopsy was performed. Toluidine blue staining and immunohistochemical staining against human mast cell tryptase using monoclonal antibody to human mast cell tryptase (Chemicon, Temecula, Calif., USA) with the biopsy specimens showed an accumulation of mast cells in mucosa and submucosa (Figure 2). The provocation test by bananas could not be performed as the informed consent of the test was not obtained, however the patient was diagnosed acute pancreatitis possibly caused by allergy to bananas because she has not suffered from any additional attacks of acute pancreatitis since the third attack by avoiding ingestion of bananas in the last thirty-four months up to this day.

Discussion

Acute pancreatitis associated with food allergy is extremely rare. In the literature, pancreatitis associated with food allergy to mustard [3], milk [5], cod roe [6], and kiwi fruits [7] has been reported. In these reports, clinical symptoms of pancreatitis rapidly improved, and all serum amylase levels were normalized within a few days, which was identical to the results from our case.

It is well known that food allergy can manifest itself clinically exclusively with digestive symptoms although frequently accompanied by symptoms in other organs, such as asthma and urticaria. In the case of our patient, the predominant symptom was abdominal pain accompanied by migraine and pruritis. These were in agreement with symptoms of acute pancreatitis resulting from food allergy upon review of the literature [4,5,7].

It has been proposed [9] that the obstruction of the ampulla of Vater, as by a gallstone, would allow reflux of bile into the pancreatic duct as well as an inappropriate activation of zymogens. An endoscopic examination in this case showed an inflammatory change on the ampulla of Vater. Therefore a biopsy was performed. Immuno-

histochemical staining against human mast cell tryptase with the biopsy specimens showed mast cells accumulating in mucosa and submucosa. Recently, Braganza [10] reported that mast cells play a pivotal role in lethal acute pancreatitis. Our patient had eaten bananas before each attack, however now remains asymptomatic after avoiding ingestion of bananas. Specific IgE to bananas in our case was 2.18 UA/1, a low positive. Concerning specific IgE, specific IgE to cow milk was 2.17 KU/1 in a case of acute pancreatitis associated with milk allergy [5]. With all of this in mind, one potential mechanism in this case is that hypersensitivity to a food substance could cause an obstruction of the ampulla of Vater, which may allow reflux of bile into the pancreatic duct as well as an inappropriate activation of pancreatic enzymes.

In *conclusion*, this is the first possible case of acute pancreatitis induced by allergy to bananas, which suggests that food allergy should be considered in a case of acute pancreatitis of unknown etiology.

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