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Abstract

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A CASE OF CHRONIC PANCREATITIS SUCCESSFULLY TREATED BY ENDOSCOPIC REMOVAL OF PROTEIN PLUGS

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Abstract. A 56 years old male with chronic pancreatitis complained of intractable abdominal pain, anorexia, emaciation and peripheral edema. Medical treatment initiated only partial improvement in the general condition and hypoproteinemia. Endoscopic retrograde cholangiopancreatography revealed multiple filling defects in the dilated main pancreatic duct. Endoscopic aspiration of pure pancreatic juice yielded numerous protein plugs. The endoscopic removal of protein plugs from the pancreatic duct resulted in remarkable improvement in symptoms, laboratory findings and ERCP findings. We consider this procedure to be an important new treatment of chronic pancreatitis.

Key words : chronic pancreatitis, protein plugs, treatment of chronic pancreatitis, pure pancreatic juice.

Protein plugs in the pancreatic duct system can play an important role in the pathogenesis and evolution of chronic pancreatitis, especially in alcoholic chronic pancreatitis (1, 2). The protein plugs can be removed together with pure pancreatic juice by endoscopic retrograde catheterization of the papilla (3-6). It has been reported recently that the endoscopic removal of protein plugs from within the pancreatic duct can be useful in the treatment of chronic pancreatitis (7, 8). This paper is a case report of a patient with chronic pancreatitis who improved remarkadly after endoscopic removal of protein plugs.

CASE REPORT

A 56 years old male patient had an acute onset of pancreatitis followed by pseudocyst formation on September 10, 1979. The pseudocyst was resected on October 19, 1979, together with the distal half of the pancreas, the spleen, and left one-third of the transverse colon. A stone was found in the main pancreatic duct of the tail, and microscopic findings of the resected pancreas were compatible with advanced chronic pancreatitis. Postoperative investigations revealed exocrine and endocrine pancreatic insufficiency : fasting blood sugar, 136

mg/dl and exocrine pancreatic function test with the synthetic peptide, BT-PABA (9-11), 68 percent (our normal range is 75 to 100 percent). He drank 480 ml/day of sake (equivalent to 86 g of ethanol) for 20 years until complete abstinence 16 years ago. His postoperative course was uneventful with diet and enzyme replacement therapy until September 1981 when he began to have repeated episodes of stomatitis, anorexia, upper abdominal discomfort and peripheral edema. On January 19, 1982, he was admitted to Ehime Prefectural Central Hospital with increasing upper abdominal pain, anorexia, and emaciation which followed an episode of the common cold.

On admission, the patient was dehydrated and emaciated (height 152 cm, weight 37 kg). His heart rate was 69/min and BP 112/64 mmHg. Mild tenderness was noted in the epigastrium. The liver was not palpable. Pitting edema was noted on the dorsal aspect of the feet. Laboratory investigations revealed Hb 7.9 g/dl, total leucocyte count 3,600/mm^3, fasting blood sugar 138 mg/dl, serum sodium 141 mEq/l, potassium 3.9 mEq/l, chloride 108 mEq/l, calcium 3.7 mEq/l, iron 59 ng/dl, creatinine 0.9 mg/dl, serum bilirubin 0.6 mg/dl, amylase 59 Somogyi U, SGOT 26 KU, SGPT 23 KU, alkaline phosphatase 7.9 KAU, serum total protein 4.2 g/dl, albumin 2.0 g/dl, total cholesterol 73 mg/dl, and triglyceride 115 mg/dl. The pancreozymin secretin test revealed an exocrine pancreatic dysfunction : decreased maximal dicarbonate concentration (69.9 mEq/l) and amylase output (3,641 Somogyi U) with normal secretory volume (138 ml). During an exocrine pancreatic function test using the synthetic peptide, BT-PABA, cumulative PABA recovery in the urine showed a remarkable decrease of 37 percent. After administering 75 g OGTT, blood sugar was 299 mg/dl at 30 min, 351 mg/dl at 60 min, 332 mg/dl at 90 min and 293 mg/dl at 120 min. Abdominal ultra-sonography revealed an echogenic substance with no acoustic shadow in the dilated main pancreatic duct. Abdominal computed tomography revealed a high density substance in the dilated main pancreatic duct.

Diet therapy, oral administration of cimetidine and pancreatic enzymes, and parenteral administration of glucose with insulin, aprotinin and heat-treated human plasma protein fraction were initiated. His general condition and some of the laboratory findings showed an improvement in three weeks : disappearance of peripheral edema, gain of 1 kg body weight and an increase in serum protein up to 6.4 g/dl. However, the abdominal pain, anorexia, anemia and hypocholesterolemia had persisted until four weeks after admission when endoscopic retrograde cholangiopancreatography (ERCP) and aspiration of pure pancreatic juice were performed. ERCP demonrtrated multiple filling defects in the dilated main pancreatic duct (Fig. 1). Pure pancreatic juice obtained by endoscopic retrograde catheterization of the papilla had numerous aggregates (Fig. 2) which were shown by histochemical studies (Fig. 3) to have fine structures identical with the protein plugs descrived previously (3, 4). Subsequent ERCP (Fig. 4) revealed only a few filling defects remaining in the main pancreatic duct. No stenotic segment was

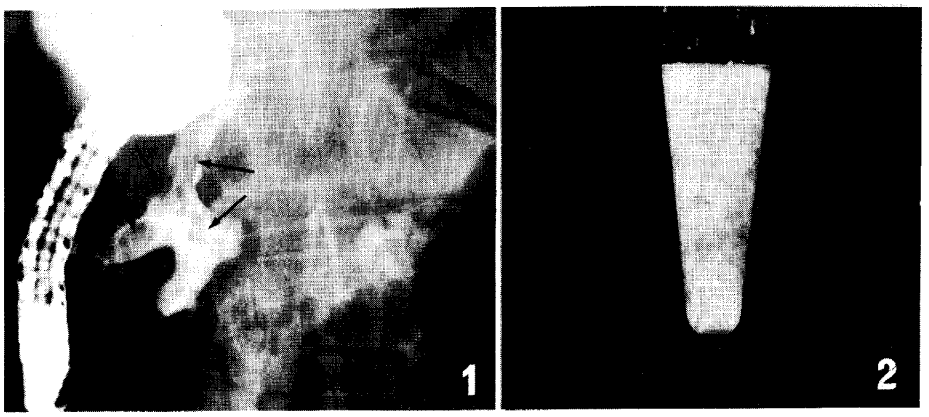

Fig. 1. The first endoscopic retrograde pancreatogram shows multiple filling defects in the dilated main pancreatic duct before the endoscopic removal of protein plugs.

Fig. 2. Numerous protein plugs obtained from within the main pancreatic duct by endoscopic retrograde catheterization of the papilla.

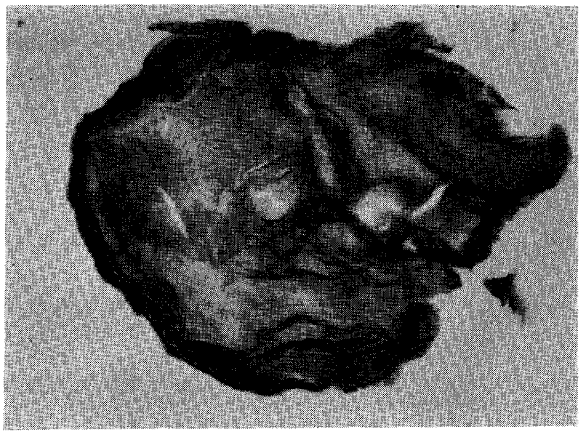

Fig. 3. Microscopic appearance of a protein plug showing a central core enwrapped by lamellar structures. Fixed in 10 percent formaldehyde, embedded in paraffin, and sectioned for double staining with periodic acid-Schiff and alcian blue, pH 2.5 (× 100).

noted in the outflow tract of the pancreatic duct. Immediately after the endoscopic removal of protein plugs, his abdominal pain disappeared, and his appetite improved remarkably. His general condition and laboratory findings showed a gradual improvement despite cessation of parenterial administration of glucose, insulin, and human plasma protein fraction. On discharge at the end of March, 1982, laboratory investigations revealed Hg 10.3 g/dl, serum total protein 7.1 g/dl

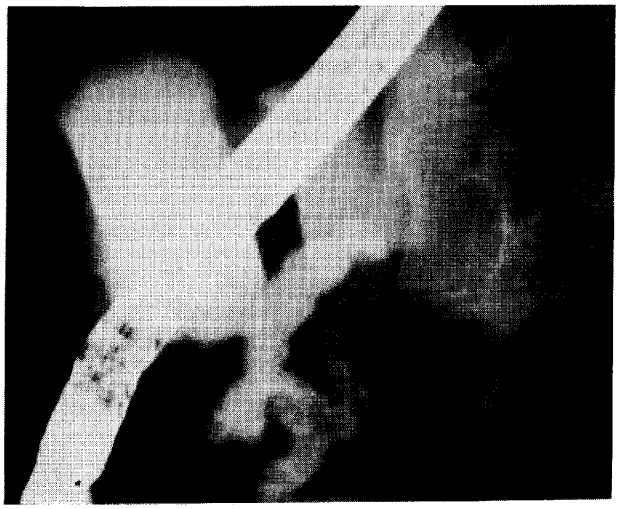

Fig. 4. The second ondoscopic retrograde pancreatogram shows only a few filling defects in the dilated main pancreatic duct after the endoscopic elimination of protein plugs.

with albumin 4.4 g/dl, serum cholesterol 121 mg/dl, fasting blood sugar 112 mg/dl, PFD 57 percent. His body weight was 42 kg. He has been leading an active social life with diet therapy and enzyme replecement therapy. Mild epigastric discomfort necessitated the endoscopic removal of protein plugs approximately every four months. The yields of plugs were as high as the first treatment. Investigations on February 10, 1983 revealed his body weight to be 45 kg, Hb 12.0 g/dl, serum total protein 7.0 g/dl, serum cholesterol 153 mg/dl, serum amylase 101 Somogyi U, fasting blood sugar 97 mg/dl, and PFD 70 percent.

DISCUSSION

Sarles *et al.* (3), Harada *et al.* (4, 5) and Guy *et al.* (6) reported that protein plugs were obtained together with pure pancreatic juice from within the pancreatic duct of patients with chronic pancreatitis by endoscopic retrograde catheterization of the Vaterian papilla. Even after intravenous injection of secretin, the protein plugs within the pancreatic duct scarcely flowed out into the duodenum through the Vaterian papilla. Recently, Harada *et al.* (7) reported that the endoscopic removal of protein plugs could be a useful treatment of chronic pancreatitis since the successful removal of protein plugs resulted in a quick relief of intractable abdominal and back pain in 17 of 69 patients with chronic pancreatitis or suspected chronic pancreatitis. In 11 of the 17 patients, further attacks of acute exacerbation were prevented as well. Kitano *et al.* (8) also reported a patient with chronic pancreatitis who showed improvement in abdominal pain after the endoscopic procedure.

The present paper concerns a patient with chronic pancreatitis who showed remarkable improvement in not only symptoms and laboratory findings, but also RECP findings and exocrine pancreatic function after the endoscopic procedure. The patient's abdominal pain and anorexia were relieved most probably as a result of improvement in pancreatic juice out-flow, because the relief was attained almost simultaneously with an improvement in ERCP findings, *i.e.*, marked decrease in filling defects in the pancreatic duct. The initial improvement in body weight, edema and hypoproteinemia was due to parenteral administration of glucose, insulin and human plasma protein fractions. However, the later improvement in the patients general condition and laboratory findings, such as body weight, anemia, hypoproteinemia and hypocholesterolemia, was considered to be brought about through the restoration of exocrine pancreatic function as well as increased food intake resulting from amelioration of anorexia and abdominal pain. Gradual improvement followed the endoscopic procedure despite the cessation of parenteral administration of nutritional supplements. According to Harada *et al.* (7), abstinence from alcoholic bevarages usually results in the cessation of protein plug formation in patients with no stenotic lesions in the major pancreatic duct system. In this patient, however, intermittent endoscopic catheterization has been necessary to eliminate newly formed protein plugs despite 16 years of abstinence from alcohol and the absence of any stenotic lesions of the main pancreatic duct. This situation indicates that a biochemical abnormality of the pancreatic juice can be irreversible even after abstinence from alcohol. Consequently, operative procedures, such as longitudinal pancreatico-jejunostomy or papilloplasty, would be of more benefit in this case from a long-term prognostic point of view. The endoscopic removal of protein plugs is useful only for providing temporary relief from pain and an improvement in the general condition as discussed in the first case of Harada *et al.* (7). However, this patient is reluctant to undergo any surgical procedure despite our repeated advice, but does consent to the intermittent endoscopic procedure.

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