

1 Successful Endoscopic Treatment of Accessory Pancreatic Duct
2 Stones in an Elderly Patient with IgG-4 Related Disease: A Case
3 Report and Literature Reviews

4 Benyan Wu¹

5 ¹ Nanlou Clinical Department of General Hospital

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8 **Abstract**

9 A 93 year old patient who had an acute pancreatitis caused by the obstruction of the
10 pancreatic duct stone is described in this study. He had a history of IgG4-related disease and
11 refused to accept steroid therapy. Abdominal CT and MRCP imagines showed that multiple
12 calculi were located in the pancreatic and the pancreatic duct was stretched. The patient
13 underwent Endoscopic Retrograde Cholangiopancreatography detection after a
14 multidisciplinary consultation. Yet, the catheter can't be inserted into the major pancreatic
15 duct owing to the hyperemia of duodenal papilla, although endoscopic sphincterotomy was
16 performed. Fortunately, The minor duct was cannulated with a standard sphincterotome, and
17 a sphincterotomy was performed followed by successful extraction of the pancreatic
18 stone(1.0×0.8cm). Since then the patient had no epigastric pain and had a good quality of life.
19 Three years later, he came to our department again for diarrhea. Pancreatic enzyme treatment
20 of diarrhea associated with the chronic pancreatitis was very effective for the patients.

21

22 *Index terms—*

23 **1 Introduction**

24 pancreatic duct stone is defined as stone or calcification in pancreatic duct [1][2]. In 1667, De Graaf firstly reported
25 pancreatic stone disease. With the advancement of radiological techniques in diagnosis and in-depth study, the
26 incidence of pancreatic duct stone appears to be rising in recent years, mainly in Europe and the United States.
27 Currently, the definite pathogenesis of pancreatic duct stone disease remains to be unknown. Several factors
28 contribute to the stone formation or calcification in the pancreatic duct, including chronic pancreatitis, pancreatic
29 duct fibrosis, malnutrition, alcohol abuse, spontaneous pancreatic duct stone, hypothyroid, etc [3][4][5][6][7].

30 Pancreatic duct stone is difficult to diagnose in its early stage due to the absence of specific symptoms. However,
31 with the enlargement of the stone, the patient appears abdominal pain or other discomforts. These symptoms
32 need to be diagnosed and treated. Treatments effectively used including surgical, endoscopic techniques, laser
33 lithotripsy, and extracorporeal shock wave lithotripsy (ESWL), balloon stenting, and medications [8]. The success
34 of endoscopic intervention as a less invasive procedure in the treatment of pancreatic stones is partly due to the
35 improvement of endoscopic techniques. However, pancreatic duct stones approximately 5 mm or greater are often
36 not amenable to conventional management with sphincterotomy, stricture dilation, or stone retrieval with basket
37 balloon catheter dilation [9]. This is one of the first reported cases of successful removal of such a big accessory
38 pancreatic duct stone under ERCP in an elderly patient with an acute pancreatitis attack. Another interesting
39 finding is that, the patient meets the diagnostic criteria of IgG-4 related disease, and the diffused pancreatic
40 calculi might be associated with IgG4-related diseases involving pancreas. The patient lived a novel life since the
41 minor invasive operation, although three years later he had diarrhea associated with the chronic pancreatitis.

42 **2 Case report a) General information of the patient**

43 A 92 year old male patient was admitted to our department for continuous pain in the left upper abdomen for
44 27 hours on July 31th, 2009. He took yogurt and cakes for supper on July 29, 2009, and developed a sudden
45 abdominal pain at 22:00 pm on the same day. The pain concentrated in left upper abdominal with an intermittent
46 radiation to the left quarter rib area. His temperature began to rise as high as 38.2 centigrade at 18:50 pm on
47 July 30, 2009. He had no symptoms of nausea, vomiting, cough, expectoration, diarrhea, or urinary frequency,
48 urgency, and urodynia. He also had no history of influenza exposure, tuberculosis or hepatitis. He also denied a
49 history of hypertension, coronary heart disease,

50 **3 c) Image study of pancreas**

51 When the patient came to our department, abdominal CT showed swelling pancreas with the extended
52 pancreatic duct, and calcification image could be observed in duodenal papilla (Fig1a). After the calculi
53 (dimension:1.0×0.8cm) in the accessory pancreatic duct was removed by sphincterotomy under ERCP, abdominal
54 CT showed there no longer calculi in the duodenal papilla (Fig. ??b). Three years later, abdominal CT, MRI,
55 MRCP showed that pancreas atrophy with mild extended pancreatic duct.

56 **4 Ultrasound images of glands and superficial lymph Nodes**

57 Ultrasound images showed that thyroid gland, parotid gland, and submandibular gland were enlargement as
58 listed in Fig. 2a-2c Fig. 2a Fig. 2b Fig. 2c II.

59 **5 Treatments a) Conservative Therapy**

60 The clinical symptoms, lab examinations, and images suggested a definite acute pancreatitis. The treatment
61 including fasting and decompression, inhibition of pancreatic secretion, drugs of trypsin inhibitors, nutrition
62 support and antibiotics were administered to him. But the treatments above can't alleviate the symptoms
63 completely.

64 **6 Fig.1a**

65 Fig. ??b of the patient. All the experts agreed that the diagnosis of this patient was definite, and the symptoms
66 of the acute pancreatitis might not be ameliorated if the obstruction of the pancreatic duct was still on. ERCP
67 should be done immediately.

68 **7 c) Endoscopic Technique**

69 Since the conservative therapy can't relieve the symptom of abdominal pain, he underwent ERCP after a
70 multidisciplinary consultation. Yet, the catheter can't be inserted into the major pancreatic duct due to the
71 hyperemia of duodenal papilla, although endoscopic sphincterotomy was used. Fortunately, we observed that
72 minor papilla of the duodenal was even more hyperemia which suggested that the presence of the stones. Then
73 the minor duct was cannulated with a standard sphincterotome, and a sphincterotomy was performed which
74 resulted in successful extraction of the pancreatic stone(1.0×0.8cm). (Figure ??3)

75 **8 d) Complication and Outcome**

76 There were no complications during the operation, and his abdominal pain was relieved after the procedure. The
77 patient was followed for 38 months with no evident discomforts.

78 **9 III.**

79 **10 Discussion**

80 To our knowledge, this is the first paper to report the successful removal of a big stone of 1.0×0.8cm in the
81 accessory pancreatic duct removed by sphincterotomy under ERCP in such an elderly patient. Furthermore,
82 no abdominal pain or any symptom of acute pancreatitis has been caused again during the follow up for more
83 than 3 years. Another interesting finding is the patient had an IgG-4 related disease involved in multiple glands,
84 including the pancreas.

85 The IgG4-related disease represents a systemic disease characterized by extensive IgG4-positive plasma cells
86 and T-lymphocyte in filtration of various organs. Clinical manifestations are apparent in organs such as the
87 pancreas, bile duct, gall bladder, salivary glands, retroperitoneum, kidney, lung, and prostate gland, where tissue
88 fibrosis with obliterative phlebitis is pathologically induced. In some cases, only one or two organs are clinically
89 involved, whereas others show effects on three or four organs [10][11][12][13]. This patient had a high level of
90 serum IgG4, and characteristic diffuse swelling in multiple organs and superficial lymph nodes, suggested that he
91 suffered from IgG4-related diseases. From the CT or MRI scanning for the pancreas, we can see the atrophy of
92 the pancreas, extension of the pancreas duct, along with multiple calcifications in the pancreas. So we suspected
93 that the chronic pancreatitis is associated with IgG4-related disease. Later, he had the symptom of the diarrhea,
94 and the effectiveness of the pancreatic enzyme treatment of diarrhea confirmed our assumption.

95 Based on the chronic pancreatitis, he was hospitalized with acute pancreatitis. According to the result from
96 lab examination and imagining scanning, we suspected that symptom of the acute pancreatitis might be caused
97 by the obstruction of pancreatic duct due to the stone. Considering the factors of his advanced age and other
98 potential risks, ERCP detection was undergone and fortunately, a stone located in the accessory pancreatic duct
99 was found and removed successfully. Since then, the patient continues to live a normal life after the operation.

100 In conclusion, this paper is first case where a big stone located in the accessory pancreatic duct was removed
101 successfully using sphincterotomy under ERCP in an elderly patient with no complications. Long time of clinical
102 remission indicated that minor invasive operation of sphincterotomy under ERCP was suitable for the elderly
patient with pancreatic duct stone.¹



Figure 1: P 2 ©

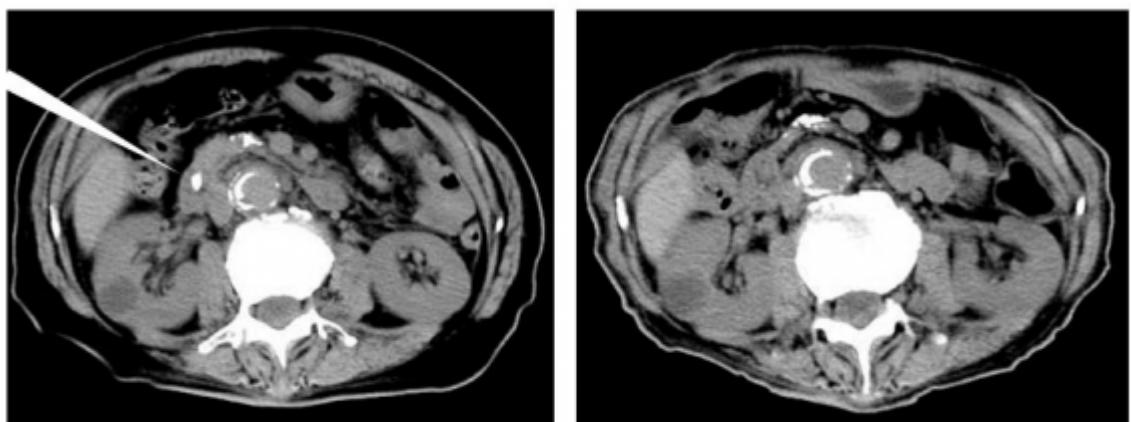


Figure 2:

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128 [Table 1 : Serum concentration of subtype of IgG4 Subtype of IgG Concentration (mg/dl) Normal Range (mg/dl) IgG1]
129 *Table 1 : Serum concentration of subtype of IgG4 Subtype of IgG Concentration (mg/dl) Normal Range*
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