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## Aneurysm of the Right Gastric Artery Associated with Hemorrhagic Pseudocyst of the Pancreas

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### 膵偽のう胞症に合併した右胃動脈瘤の1例

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58才男性で急性腹症としてショック状態で緊急入院。そして内科的に急性膵炎として治療された。この症状がおさまってから腹腔動脈造影を行なった所、右胃動脈の根部に小動脈瘤を発見した。この部位の動脈瘤を発見することは非常に稀

である。又この動脈瘤の成因について急性膵炎との関係も考えられたが一応先天性とした方が良いのではなかろうかと結論した。以上非常に稀な右胃動脈の動脈瘤の一症例を報告した。

Although there have been occasional reports of hepatic artery aneurysms<sup>3)5)7)8)</sup>, the aneurysm of the right gastric artery has not been recorded in the literature to our knowledge. We recently treated a patient with symptoms and signs of acute pancreatitis, on whom an aneurysm of the right gastric artery was angiographically demonstrated and a small hemorrhagic pseudocyst of the pancreas surgically found.

In addition to the rarity of the location of the aneurysm, the pathogenesis of the aneurysm in relation to the hemorrhagic pseudocyst of the pancreas is of profound interest. We concluded that the aneurysm of the right gastric artery was of congenital origin, and that the hemorrhagic pseudocyst of the pancreas was not directly related to the aneurysm.

#### Case Report

A 58-year-old male, a professor of Law and Literature Faculty, went to his office in the morning and

collapsed down on the desk after a short while of pain in the left epigastrium. A history of heavy alcoholic intake at wedding ceremony of his relatives on the previous day was given. Physical examination on emergency admission to Kanazawa University Hospital revealed an acutely ill person with a blood pressure of 66, systolic and 50, diastolic. There was tenderness in the midepigastrium. Serum amylase was 5.35 u. (normal from 0.7 to 2.9 u.) and urine amylase was 34.2 u. (normal less than 12 u.). All liver function tests gave normal results. Serology was negative.

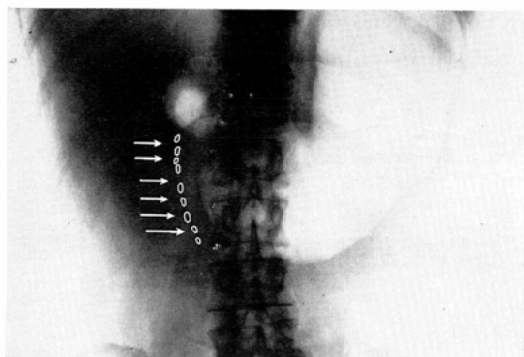


Fig. 1. Flat abdomen shows small bubbly gas shadows (arrows) compatible with paralytic ileus of the descending portion of the duodenum.

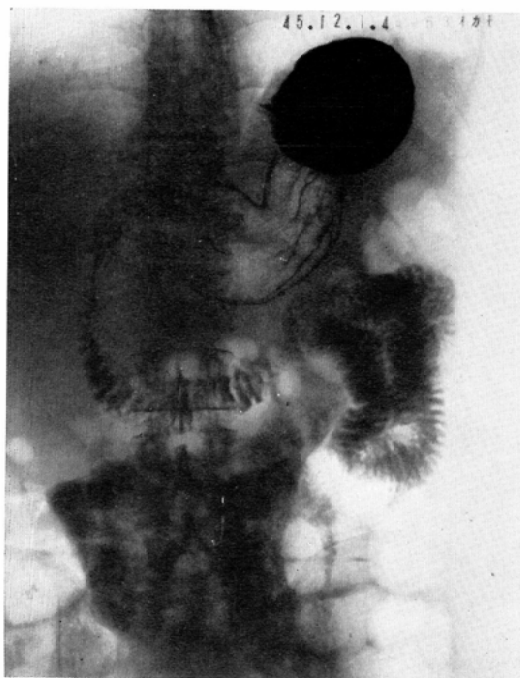


Fig. 2. Upper gastrointestinal examination shows a constant spastic contraction of the descending portion of the duodenum.

Roentgenogram of the flat abdomen revealed small bubbly gas shadows like stepping-stones right to L1 and L2, representing paralytic ileus of the descending portion of the duodenum (Fig. 1). Emergency upper GI series showed a constant spastic contraction of the descending limb of the duodenum (Fig. 2). After complete recovery from the shock status one of the staffs felt a mass in the right upper quadrant of the abdomen. An oral cholecystogram was normal. Serum and urine amylase had been all within normal limit except for the first positive study.

Celiac and hepatic angiograms were performed on 23rd hospital day in searching for the pseudocyst formation in the head of the pancreas. There was an irregularly-shaped pool of contrast material at the trifurcation of the common hepatic artery (Fig. 3, 4). With an additional oblique view (Fig. 5) and with the finding of a delayed filling of the right gastric artery from the pool of contrast material (Fig. 4), it was interpreted as an aneurysm of the right gastric artery. There was no evidence of spasm or displacement of near-by vessels, which might have indicated a presence of hemorrhage or an unopacified large

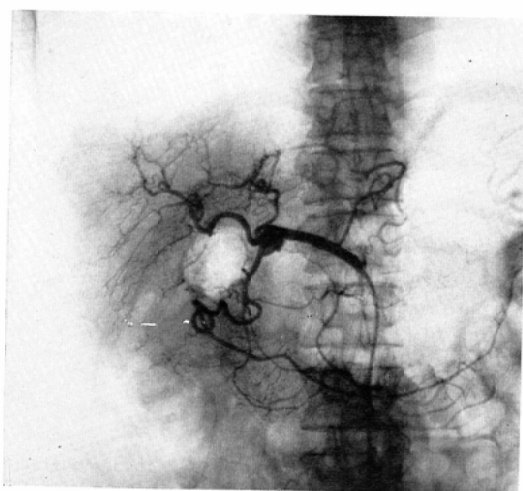


Fig. 3. Proper hepatic arteriogram discloses an irregularly-shaped aneurysm of the right gastric artery. Peripheral hepatic arteries show corkscrew appearance.

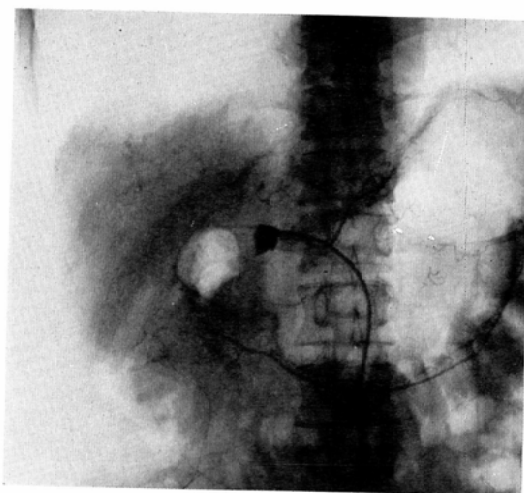


Fig. 4. Delayed filling of the right gastric artery seems to be a flooding of the aneurysm on the proper hepatic arteriogram.

hematoma accompanying the aneurysm. Hepatic arteries revealed a mild degree of corkscrew appearance compatible with chronic hepatitis. Vessels in the head of the pancreas were read as normal.

At operation, which was performed on the 72nd day from the initial onset, the aneurysm was "riding on" the right gastric artery just distal to its take-off from the hepatic artery. It was 1.5 cm in diameter and saccular. In addition, a hematoma or hemorrhagic pseudocyst, of a size of approximately 2.5 by 3 cm, was found in the neck of the pancreas. There was otherwise no surgical evidence of pancreatitis. The aneurysm was removed together with the right gastric artery. At the section the clot was laminated, and partly organized in the arterial aneurysm. The hemorrhagic pseudocyst was actually a hematoma with minimal fat necrosis surrounding it.

### Discussion

The cause and effect of the aneurysm and the hemorrhagic pseudocyst are not entirely clear. Baum et al.<sup>2)</sup> describe rupture of a splenic artery aneurysm diagnosed by celiac angiography in a patient with the clinical picture of hemorrhagic pancreatitis. On the angiogram a true lumen of the aneurysm and a false sac due to the ruptured aneurysm were well demonstrated. On the other hand, incorporation of the celiac vessels in the wall of the pseudocyst in patients with recurrent pancreatitis has been reported by several authors<sup>1)3)</sup>.

In our case, however, the surgeon could find little evidence of bleeding surrounding the aneurysm or of chronic pancreatitis, but only a small hematoma in the neck of the pancreas without apparent relation in between (Fig. 6).

One must be reminded of intracranial berry aneurysm in the area of the circle of Willis by its location of vascular bifurcation in this case. Although none has been reported in the right gastric artery to our knowledge, the aneurysm is most probable to be of congenital origin as is so widely accepted in cases of intracranial saccular aneurysms. Guida et al.<sup>5)</sup> tabulated the etiology of hepatic artery aneurysm in 120

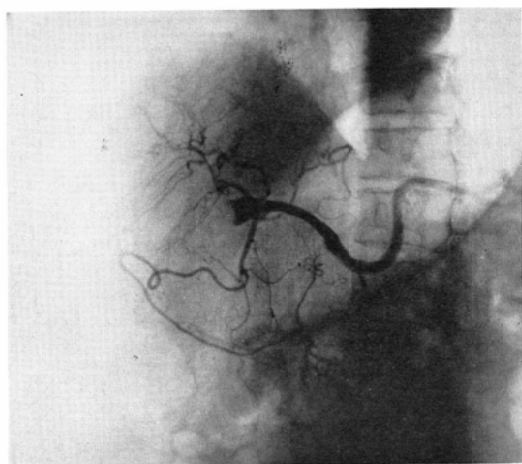


Fig. 5. Right posterior oblique view of the proper hepatic arteriogram shows anterior relation of the aneurysm to the right gastric artery.

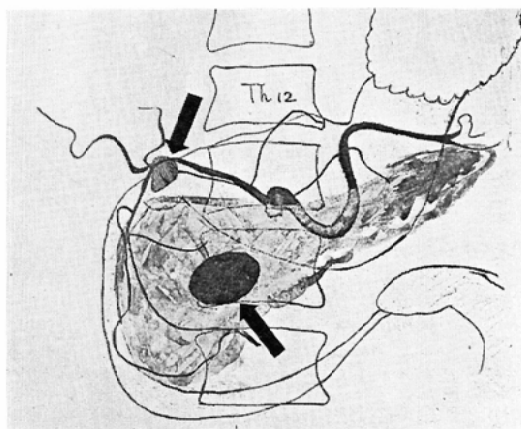


Fig. 6. Composite diagram of the roentgenographic and surgical findings reveals anatomical relation between the aneurysm (upper arrow) and the hematoma (lower arrow) in the neck of the pancreas.

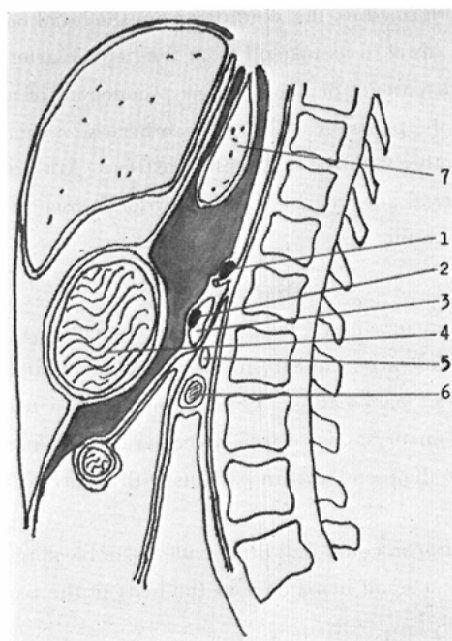


Fig. 7. Sagittal section diagram from the Gray's anatomy may help further understanding of the anatomical situation of the lesions. 1-aneurysm of right gastric artery, 2-pseudocyst of pancreas, 3-neck of pancreas, 4-stomach, 5-uncinate process of head of pancreas, 6-duodenum, horizontal part, 7-caudate lobe of liver. Lesser omentum lightly stained.

cases recorded in the literature. Infection is the most frequent cause, with arteriosclerosis a close second. Only one is of questionable congenital etiology.

Fibrosing lesion of the artery such as fibromuscular dysplasia or polyarteritis nodosa as a possible cause of the aneurysm lacks histological proof as well as clinical and angiographic features.

Then, how the hematoma took place in the neck of the pancreas? It does not seem reasonable from the angiographic and surgical points of view that the ruptured aneurysm<sup>2)</sup> of the right gastric artery brought about acute pancreatitis with subsequent encapsulation of the hemorrhage at the neck of the pancreas. Neither is the erosion of the saccular aneurysm of the right gastric artery with hemorrhage in the retroperitoneum by an upward extension of activated pancreatic enzymes to be justified without further clear-cut evidence of acute pancreatitis<sup>10)</sup> (Fig. 7).

One of contributory factors to the pancreatic lesion must be heavy drinking prior to the onset of the illness, although there has been no documented episodes of acute pancreatitis previously. The importance of alcoholism in precipitating attacks of acute pancreatitis has been realized by many authors<sup>4)11)</sup>. On the other hand, considering that the patient had an aneurysm supposedly of congenital origin in the right gastric artery, there might have been a site of congenital weakness of vessel wall. Therefore, another factor to the pancreatic lesion might be vascular<sup>6)</sup>. A focal form of acute pancreatitis may result from prolonged, severe and extensive ischemia<sup>11)</sup>.

Whatever the explanation may be, from the available information we induced the conclusion that the aneurysm of the right gastric artery and the pseudocyst of the pancreas were coincidental.

### Summary

A case of aneurysm of the right gastric artery associated with hemorrhagic pseudocyst of the pancreas is reported.

In addition to the rarity of the location of the aneurysm, the pathogenesis of the aneurysm is discussed.

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