Hiroshima Journal of Medical Sciences
Vol.35, No.4, 293~297, December, 1986
HIJM 35-42

Mesenteric Bleeding due to a Ruptured Aneurysm of the Middle Colic Artery

Toshiya MATSUYAMA[1], Katsufumi KAWABORI[1], Hirofumi NAKATSUKA[1], Kenji TOKUMO[2], Ken HARUMA[2] and Kiyohiko DOHI[1]

1) The Second Department of Surgery, Hiroshima University School of Medicine;
2) The First Department of Intenal Medicine, Hiroshima University School of Medicine; 1-2-3, Kasumi, Minami-ku, Hiroshima 734, Japan

(Received July 10, 1986)

Key words: Aneurysm, Middle colic artery, Superior mesenteric artery branch

ABSTRACT

An outpatient with repeated colic attacks of unknown cause was hospitalized and was subjected to CT scan, ultrasound inspection, cytodiagnosis via abdominocentesis, resulting in the diagnosis of epigastrial hematoma. Further angiographical investigation evidenced the presence of middle colic artery. Aneurysm was also detected in the right colic artery. Other celiac arteries, however, were normal. The aneurysms detected were surgically removed with a portion of the intestinal tract. The pathological investigation of the resected aneurysm in the present cast could not prove the association with several other diseases which have been mentioned as possible causes for aneurysm. While only 10 cases of aneurysm at the superior mesenteric arterial branch have been reported, the authors believe that angiographical inspection should indispensably be attempted for diagnosis in cases of abdominal pain or abdominal tumors of unknown causes.

Much knowledge of the natural history has been accumulated about ordinary aneurysms occurring at peripheral arteries, and their therapeutic standards have been established. However, very few cases have been reported on the aneurysms at celiac arteries, especially, those occurring a the superior mesenteric arterial branch, and their clinical profiles are not yet sufficiently clarified. The present article intends to report the outline of the clinical course of a case of aneurysm at the middle colic artery of which the authors were able to perform preoperative diagnosis though they were initially with some diagnostic hesitation. The article will also discuss the 10 reported cases in this country of aneurysm at the superior mesenteric arterial branch.

CASE REPORT

The patient was a 53-year-old Japanese carpenter. No remarkable familial history was present, and he had no history of heart diseases, hypertension, diabetes, or abdominal injury. The patient had twice experienced colic attack around the umbilicus and his nearest physician had examined his digestive tract, and, before any determinate diagnosis had been made, he was hospitalized in the affiliated hospital of Hiroshima University due to his third colic seizure. Table 1 represents the clinical test figures at the time of hospitalization. The patient's systemic conditions were not very serious with normal ECG recordings; he only exhibited anemia and slight elevation of blood and urinal amylase. The patient however carried a swelling of the size of a fist at the epigastric region, and blood was detected through cytodiagnosis via abdominocentesis which was guided under ultrasound guidance. The swelling was observed thereafter by CT to be regressed, until it became a spherical mass having a diameter of 5.0 cm (Fig. 1).

Table 1

WBC	13700
RBC	305 x 10^4
Hgb	9.5 g/dl
Hct	21.2%
Wasserman reaction	(—)
ABO	86 (<160)
CRP	0.4 mg/ml (1.0)
RA	(—)
Ig-G	110 mg/dl (690—1580)
Ig-M	260 mg/dl (100— 370)
Ig-A	112 mg/dl (45— 230)
Ig-D	6.0 (<8.0)
Serum amylase	243 U
Urine amylase	238 U
Anti DNA antigen	76 (<80)
Anti nuclear antigen	8 (<10)
LE	(—)

Fig. 1. Upper part : CT immediately after hospitalization
Lower part : CT after 2 weeks of hospitalization. Tumor became smaller from fist-to egg-size.

From the above-stated findings, the swelling was diagnosed as a hematoma. Subsequent selective abdominal angiographical practice further elucidated a walnut-sized aneurysm at the ramus dextra of middle colic artery. Additionally, small rosary-like aneurysms were detected at the ramus sinister as well as arteria colica dextra (Fig. 2). There was no abnormality in the findings of angiography for abdominal aorta, celiac arteries, or inferior mesenteric artery. Thus it was concluded that the hematoma had been caused by the puncture of the aneurysm at the ramus dextra of middle colic artery and the leaked blood was absorbed in the course of time to be in the present reduced state. As a finding at the operation, aneurysm was found in the right vicinity of the second portion of duodenum, and its peripheral inflammatory edema prevailed to the head of the pancreas. Multiple occurrence of spindle-shaped small aneurysms were also found at the ramus sinister of middle colic artery and arteria colica dextra . Since these small aneurysms were considered to cause rupture if left untreated, they were all resected together with the ischemic portion of intestinal tract. Figure 3 illustrates the crosssection of the

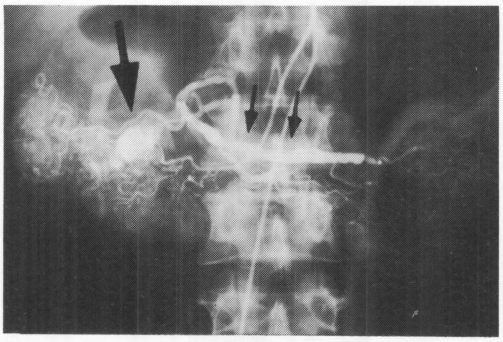

Fig. 2. Selective middle colic arteriography.
↑ : An anearysm in ramus dexter
↑↑ : A small monileform aneurysm in ramus sinister

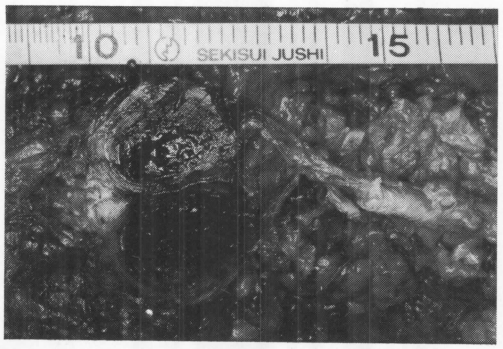

Fig. 3. A macroscopic cut surface of the aneurysm in ramus dexter, sized 27 × 18 × 18 mm and accompanied by intra-and extra-parietal hematomas.

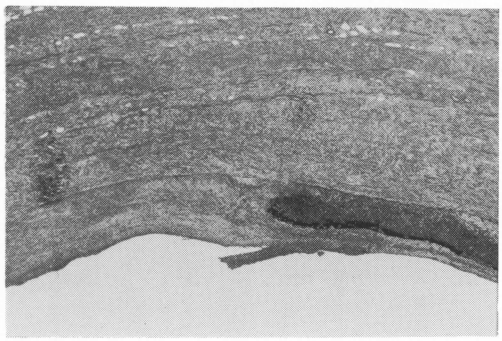

Fig. 4. A histological picture of the aneurysmal wall with elastica Van Gieson's staining. A false aneurysm in which ordinary laminar structure was completely destroyed and replaced by fibrous tissues infiltrated deep with inflammatory cells. No bacterium was evidenced. Neither specific inflamation nor atherosclerosis was observed.

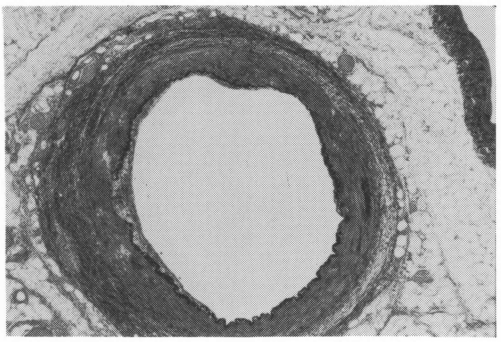

Fig. 5. Serial section picture of the small monileform aneurysm, with elastica Van Gieson's staining, showed irregular stenosis and dilatation of the lumen. The internal elastic lamina and media disappeared at many portions, with remarkable intimal hypertrophy and adventitious fibrosis. However, parietal inflammatory cellular infiltration was slight.

resected aneurysm. According to the histological examination the vascular wall of the aneurysm proved to be a pseudoaneurysm composed of connective tissue with inflammatory cellular infiltration (Fig. 4), while the other small aneurysms were true aneurysms (Fig. 5).

At any rate, there was no sign of the lack of muscular tunics suggestive of congenital malformation, of any specific inflammation, or of arteriosclerotic change.

To add, histological detection of Gram-stained bacteria failed. Possibility of present aneurysms being caused by acute pancreatitis[5] was also considered, but a specimen of the pancreatic tissue sampled during the operation was completely normal, which suggested that the transient elevation in the amylase levels observed at the time of hospitalization was considered to be attributed to the pancreas being compressed by the hematoma[9]. To conclude, arterial vascular inflammation was evidenced to be the sole cause for the present disease.

DISCUSSION

Aneurysms occurring at the visceral blood vessels have long been reported. Deterling et al[4] illustrated statistics of European and American cases up to 1970 which amounted to 1420, among which aneurysm at the superior mesenteric artery (hereinafter abbreviated as SMA) cases were reported to occupy 119 (90 cases involved stem and 29 cases involved branch as sites of incidence). As seen in these figures, incidence at the branches are extremely rare. In the subsequent decade, however, as the viscerial angiography was more and more frequently applied as a means of examining abdominal diseases, the records of SMA branch aneurysm were accumulated, until the cases numbered to no less than 40 in McNamara's statistics in 1980[13]. In Japan, a medicinal abstract lists Ishihara's finding in 1959 of a case of aneurysm at the jejunal artery which was detected during his operation of a patient with leocaecal tumor. But no further details are recorded[10]. However, regarding the 9 cases beginning with that which was reported by Hatano et al[7] in 1973, more detailed records including viscerial angiographical findings or the results of etiological investigation on the pathology of the aneurysms are encountered (Table 2). According to these reports, all the angiographically examined cases involved aneurysms in other regions except 2 cases which were caused by infection. While the aneurysms are readily interpretable as frequently triggered by arteriosclerosis from the viewpoint of etiology, it is noteworthy that the 3 cases of unknown causes, including the present authors', are alike accompanied by aneurysm at other sites of viscerial arteries, since the fact suggests some common etiological background. In spite that the most frequently encountered aneurysms in Japan have come from arteriosclerosis or infection, European and American

Table 2. Summary of cases of superior mesenteric branch aneurysms

Case	Auther (reference)	age & sex	Location of aneurysm	Chief symptom	Cause of aneurysm	Diagnosis	Treatment	Another aneurysms	Result
1	Ishihara (10) (1959)	19, Female	Jejunal	Abdominal pain	Infection (?)	Operatively	Resection	Not investigated	Recovered
2	Hatano (7) (1973)	48, Female	Inferion pancreatico-duodenal	Abdominal pain	Athero-sclerosis	Angiography	Resection	Superior pancreactico-duodenal	Recovered
3	Misote (14) (1978)	21, Female	Ileal	Abdominal pain & fever	Infection	Angiography	Resection	None	Recovered
4	Hatano (8) (1980)	68, Male	Ileocaecal	Abdominal pain & bruit	Congenital(?)	Angiography	Angioplasty	Gastro-epipleuic	Recovered
5	Atari (2) (1981)	66, Female	Ileal	Melena	Infection	Angiography	None	None	Died
6	Matsumoto (12) (1982)	75, Female	Ileal	Abdominal tumor	Athero-sclerosis	Angiography	Resection	Gastro-duodenal	Recovered
7	Kataoka (11) (1984)	51, Male	Middle-colic	Abdominal pain	Unknown	Operatively	Resection	Superior & inferior mesenteric	Recovered
8	Aoki (1) (1984)	70, Male	Ileal	Abdominal tumor & kruit	Athero-sclerosis	Angiography	Ligation	Abdominal aortic	Recovered
9	Hasegawa (6) (1985)	56, Male	Inferior pancreatico-duodenal	Abdominal pain & shock	Unknown	Angiography	Resection	Caeliac	Recovered
10	Matsuyama (1985)	53, Male	Middle colic	Abdominal pain & tumor	Unknown	Angiography	Resection Bowel Resection	Right colic	Recovered

cases have included frequent incidence of nodular periarteritis and congenital malformation as their causes[13], and there appears to be a great difference in their origin. The present report of aneurysm at the ramus dextra of middle colic artery ranks the second in the list of this disease in Japan. The two cases are of etiological interest when we think of their unknown cause, simultaneous complication of aneurysms at other sites, and other common features. As for the therapy for SMA branch aneurysm, satisfactory results are obtained by the resection of the aneurysm or arterial ligation irrespective of their causes.

Only, in a case of multiple occurence as seen in the present article, an established predetermined strategy in operation cannot be proposed. For instance, in 3 cases in Japan all the simultaneous aneurysms were removed while in other 4 cases only the aneurysms that exhibited clinical signs were removed. While there has been an opinion that insists on the resection even of small-sized aneurysm since they embrace the risk of rupture[3], there appeared no article that reported the rupture episode of aneurysm which was left untreated. The clues for the discovery of the present disease have been the signs of abdominal pain or the presence of abdominal mass followed by the application of angiographical inspection. Since angiography is an important means both for diagnosis and as an operational guide, it should be attempted in cases of abdominal complaints whose causes are unknown.

REFERENCES

1. **Aoki, K., Miyamoto, T., Tanaka, M., Murata, H., Kawahara, K., Oka. Y. and Maeda, N.** 1984. Iliac artery aneurysm — A case report and review of Japanese cases —. Jpn. J. Surg. **86**: 1450—1455. (in Japanese)
2. **Atari, H., Igarashi, M., Okuhira, M., Katsumata, T., Okabe, H. and Kusano, S.** 1981. Ileal hemorrhagic infection due to complate obstruction of superior mesenteric artery associated with

mycotic aneurysm. Report of an autopsy case. I to Cho (Stomach and Intestine) **16**: 327—331. (Summary in English)

3. **Carter, R. and Gasney, W.G.** 1966. Abdominal apoplexy. Report of six cases and review of the literature. Am. J. Surg. **111**: 388—397.
4. **Deterling, R.A.** 1971. Aneurysm of the visceral artery. J. Cardiovasc Surg. **12**: 309—322.
5. **Eckhauser, F.E., Stanley, J.C., Zelenock, G.B., Borlaza, G.S., Freier, D.T. and Lindenauer, S.M.** 1980. Gastroduodenal and pancreaticoduodenal artery aneurysms : A complication of pancreatitis causing spantaneous gastrointestinal hemorrhage. Surg. **88**: 335—344.
6. **Hasegawa, S., Kubo, K., Nakamura, T., Nakamura, S. and Suzuki, S.** 1985. Huge pseudoaneurysm due to a ruptured aneurysm of the inferior pancreaticoduodenal artery. J. Surg. Treatment **27**: 236—240.
7. **Hatano, R., Hadano, T., Sakamoto, T., Tsukuura, T., Maemura, O., Nagaoka, H., Yamada, T., Murakami, T. and Suzuki, M.** 1973. Surgical treatment of pancreaticoduodenal artery aneurysm. A case report. Ochanomizu Medical J. **21**: 107—112. (in Japanese)
8. **Hatano, R., Iwai, T., Goseki, N., Kudo, G., Hiranuma, S., Kojima, S., Murakami, T., Suzuki, S. and Aoki, N.** 1980. Multiple aneurysms of the visceral arteries with migrating vascular bruit on postural change. Jpn. J. Surg. **10**: 48—54.
9. **Hendrick, J.W.** 1956. Treatment of aneurysm of pancreaticoduodenal artery by excision. Ann. Surg. **144**: 1051—1053.
10. **Ishihara, H.** 1959. A case report of mesenteric artery aneurysm. Medical J. Hirosaki Univ. **10**: 717. (in Japanese)
11. **Kataoka, M., Naruse, M., Watarai, N., Hayashi, S., Fuji, Y., Uragami, T. and Masaoka, A.** 1984. Retroperitoneal bleeding due to a ruptured aneurysm of the middle colic artery. Jpn. J. Surg. **14**: 150—154.
12. **Matsumoto, K., Nara, S., Huruta, G., Ishitoki, K. and Abe, O.** 1982. A case report of iliac artery branch aneurysm. Jpn. J. Gastroent. Surg. **15**: 303.
13. **McNamara, M.F. and Griska, L.B.** 1980. Superior mesenteric artery branch aneurysms. Surg. **88**: 625—630.
14. **Mizote, H., Sasaki, T., Ueda, K., Araki, T., Ryu, T. and Ideguchi, T.** 1978. Aneurysm of superior mesenteric artery — A case report of preoperative diagnosis —. J. Jpn. Soc. Clin. Surg. **40**: 951—956. (in Japanese)