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<td>Author(s)</td>
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<tr>
<td>Citation</td>
<td>日本医学放射線学会雑誌. 40(10) P.944-P.950</td>
</tr>
<tr>
<td>Issue Date</td>
<td>1980-10-25</td>
</tr>
<tr>
<td>Text Version</td>
<td>publisher</td>
</tr>
<tr>
<td>URL</td>
<td><a href="http://hdl.handle.net/11094/19576">http://hdl.handle.net/11094/19576</a></td>
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<tr>
<td>DOI</td>
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Inferior Mesenteric Arteriovenous Fistula
—Report of a Case and Review of the Literature—

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Research Code No.: 591.8.513.4

Key Words: Arteriovenous fistula, Abnormal arteriovenous communications, Inferior mesenteric vessels, Angiography, Diagnosis

下腸間膜動静脈瘤の1例報告と文献的考察

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（昭和56年3月25日受付）
（昭和55年7月21日最終原稿受付）

腸間膜動静脈瘤による異常動静脈交通には
動静脈瘤とAngiodysplasia（動静脈奇形）とがあ る。

我々は腹部腫瘤を主訴とした症例で血管造影を
行なったところ、上直腸動脈支配域で動静脈瘤お よび下腸間動脈本幹相当部に異常静脈瘤、組織
学的にいわゆる脂肪組織炎を認めた。動静脈瘤と
脂肪組織炎との関連性について、組織学的、文献
的、および臨床的考察を行なったが、上直腸動脈
支配域の動静脈瘤の成因となり得べき後天性の要因は認められず、本例における動静脈瘤
は先天性と考えられた。

動静脈瘤について文献上多く報告されているが、
腸間膜動静脈支配域における動静脈瘤の報告は
27例がなされているにすぎない。その内訳をみると
て、上腸間動脈支配域が26例で、その成因として
は管型性15例（腸管切除13例、試験開腹1例、胃
切除1例）、結腸8例、剖検1例、先天性1例で
ある。一方、下腸間膜動脈支配域では腸管切除に
よる1例のみが報告されている。

症状としては腹部腫瘤、挙上、腹痛、脈圧亢進症、
腹痛、下痢等が報告されている。

治療としては腸管切開術、結紮、時として腸管
切除が行なわれる。

我々は腸間膜動静脈瘤としては症状および臨床
所見に乏しく、下腸間膜動脈支配域の動静脈瘤と
しては文献上第2例目（腸間膜動静脈瘤として28
例目）、また本邦としては第1例目的下腸間膜動
静脈瘤の1例について文献的考察を加えて報告し
た。

Abnormal arteriovenous communications of the mesenteric vessels are arteriovenous fistula and angiodysplasia (so-called arteriovenous malformation).

Mesenteric arteriovenous fistulas are rare lesions. Our review of the literature has revealed 27
Fig. 1  Inferior mesenteric arteriogram showing arteriovenous fistula.

A. Arterial phase showing dilated superior rectal artery (SRA) and saccular dilatations (arrows) at the communicating segment.

B. Late arterial phase showing dilated superior rectal artery (SRA), saccular dilatations (arrows) and early venous filling to markedly dilated superior rectal vein (V).

C. Capillary phase showing dilated superior rectal vein (V), sigmoid vein (SV) and opacified distal segment of superior rectal branch. Distal segment of inferior mesenteric vein is not opacified because of the compression by mesenteric panniculitis.

D. Venous phase showing dilated and tortuous left colic vein (LCV) as a collateral way and inferior mesenteric vein (IMV).
cases,1-47 26 cases of which have been shown in the superior mesenteric vessels and only one case of which
has been shown in the inferior mesenteric vessels.46

In our case inferior mesenteric arteriovenous fistula was shown by angiography in evaluating an
abdominal mass. The mass was mesenteric panniculitis of the sigmoid mesocolon.

We show the angiographic findings of mesenteric arteriovenous fistula and add a new case suggesting
congenital in origin to the literature.

CASE REPORT

A 70-year-old man was admitted for evaluation of the abdominal mass. He has been complaining of
vague abdominal discomfort and constipation. He has been noted the mass three months prior to
the admission.

Past history revealed hypertension and he has had transient ischemic heart attack at the age of 55
and had myocardial infarction at the age of 66. Further past history could show no other signs of
disease.

On physical examination his abdomen was slightly distended. The well mobile, firm and non-
tender mass was palpated in his left lower quadrant. There was no lymphadenopathy, and the liver
and spleen were not palpated. Hematologic studies, clinical laboratory studies and urinalysis were
normal.

Plain abdominal films showed mottled and concentric calcification in the anterior region of the
lower abdomen. Upper gastrointestinal series and barium enema studies showed diverticula and the
displacement of the sigmoid colon. Intravenous pyelogram showed the displacement of the left ureter
and hydrenephrosis of the left kidney. Sigmoidoscopic study showed only adenoma of the rectum and
the scope could not be advanced more than 30 cm from the anus, because the sigmoid colon was
deformed by the mass. There was no definite change in the mucosa of the sigmoid colon and rectum.
Computed tomogram showed calcification in the central region of the well-defined and homogenous
mass.

Abdominal aortogram and selective inferior mesenteric arteriogram showed the dilated superior
rectal artery and saccular dilatations at the communicating segment between the superior rectal artery
and veins. Late arterial phase showed early venous filling to the superior rectal vein. Venous phase
showed the dilated and tortuous left colic vein and inferior mesenteric vein (Fig. 1. A-D). There were no
tumor vessels, blush and neovascularity. No abnormalities have been shown in vasa recta. Angiographic
diagnosis was mesenteric arteriovenous fistula in the superior rectal vessels and an avascular mass of the
sigmoid mesocolon.

On January 19, 1978, laparotomy showed a very hard mass measuring about 7 cm in diameter.
The mass was derived from the sigmoid mesocolon and was adherent to the surroundings such as the
ileum, distal segment of the descending colon and retroperitoneum.

It was impossible to show the superior rectal artery and vein because the mass was firmly adherent
to the sigmoid colon. The markedly dilated veins have been shown around the mass. The mass was
removed with the distal segment of the descending colon and sigmoid colon.

Histologically the mass was so-called mesenteric panniculitis. No vessels have been involved in the
mass and there were some dilated veins at the surface of the mass. The postoperative course was uneventful.

**DISCUSSION**

An arteriovenous fistula is not a rare complication of trauma or surgery.\(^7,17,23\) However, arteriovenous fistulas involving the mesenteric vessels are rare and 27 cases have been reported in the literature. In 1960 Mowitz et al.\(^7\) reported the first case involving the mesenteric vessels of the small bowel, occurring after bowel resection. Twenty-six cases of mesenteric arteriovenous fistulas have been shown in the superior mesenteric vessels and only one case has been shown in the inferior mesenteric vessels except our case (Table 1).

The etiology of these 25 cases of the superior mesenteric vessels have been reported as follows; one case congenital;\(^23\) 16 cases iatrogenic;\(^1,7,17,18,19,21\) and 10 cases traumatic\(^5,15,11,14,21,22\) (Table 2).

The case of inferior mesenteric arteriovenous fistula, which Houdard reported in French literature, was iatrogenic in origin occurring after colectomy.\(^16\)

The symptoms and signs in the cases of mesenteric arteriovenous fistula are abdominal bruit, thrill, abdominal pain and diarrhea. The causes of abdominal pain are unclear and there have not been shown pathologic findings of ischemia or infarction of the bowel.\(^23\) The hemodynamic manifesta-

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<tr>
<td>Superior mesenteric artery</td>
<td>26</td>
</tr>
<tr>
<td>Main trunk</td>
<td>10</td>
</tr>
<tr>
<td>Jejunal branch</td>
<td>5</td>
</tr>
<tr>
<td>Ileal branch</td>
<td>4</td>
</tr>
<tr>
<td>Ileocolic branch</td>
<td>2</td>
</tr>
<tr>
<td>Middle colic branch</td>
<td>3</td>
</tr>
<tr>
<td>Right colic branch</td>
<td>2</td>
</tr>
<tr>
<td>Inferior mesenteric artery</td>
<td>2*</td>
</tr>
<tr>
<td>Superior rectal branch</td>
<td>2*</td>
</tr>
<tr>
<td><strong>Total</strong></td>
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*Including author's case.

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<th>Etiology</th>
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<td>15</td>
</tr>
<tr>
<td>Bowel resection</td>
<td>14</td>
</tr>
<tr>
<td>Laparotomy</td>
<td>1</td>
</tr>
<tr>
<td>Gastrectomy</td>
<td>1</td>
</tr>
<tr>
<td>Gunshot wound</td>
<td>9</td>
</tr>
<tr>
<td>Stab wound</td>
<td>1</td>
</tr>
<tr>
<td>Congenital</td>
<td>2*</td>
</tr>
<tr>
<td><strong>Total</strong></td>
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*Including author's case.
tions of the portal systems have been in confusion. There have been discussions that high cardiac output states such as cardiomegaly and heart failure did not occur because of damping effect of hepatic venous sinusoidal systems.\textsuperscript{39}-\textsuperscript{41} However, some authors reported that high cardiac output states had been improved to normal after ligation of the fistula.\textsuperscript{19}-\textsuperscript{21}\textsuperscript{34}

In this case there was no symptoms and signs due to arteriovenous fistula. The possible explanation of little hepatic dysfunction and clinical manifestation are that the increased blood flow in the inferior mesenteric vein would not increase portal venous pressure significantly, because these hemodynamic changes would be decreased to normal in joining with the large amount of blood flow from the superior mesenteric vein and splenic vein and in damping effect of hepatic venous systems.

Angiographic findings of arteriovenous fistula are;
1. dilated feeding artery,
2. saccular dilatation a. the communicating segment, and
3. early opacified and markedly dilated vein(s).

These angiographic findings are different from that of angiodysplasia\textsuperscript{39}-\textsuperscript{40}.

The vessels in the cases of mesenteric panniculitis are rarely involved and in some cases displaced and distorted vessels\textsuperscript{40} and vascular encasement\textsuperscript{40} have been reported angiographically. The thrombus have been rarely shown in involved veins.

Mesenteric panniculitis is etiologically unknown and is characterized by chronic, nonspecific inflammatory processes involving the adipose tissue of the mesentery. Abdominal trauma, abdominal tuberculosis, mesenteric arterial occlusions, allergic reactions, Schwartzman phenomenon and pancreatitis have been discussed as causative factors.\textsuperscript{25}-\textsuperscript{27} Histologically mesenteric panniculitis has been shown to be the same processes as seen in the fat necrosis of pancreatitis.

No relationships have been shown between arteriovenous fistula and mesenteric panniculitis in this case histologically. Usually surgical treatment such as fistulectomy, ligation and bowel resection has been performed.

CONCLUSION

The case of a 70-year-old man with inferior mesenteric arteriovenous fistula is reported. Although 27 cases with mesenteric arteriovenous fistulas have been reported, only one case of inferior mesenteric arteriovenous fistula has been reported. The etiology is iatrogenic in 16 cases, traumatic in 10 cases and congenital in one case.

This is the second case of inferior mesenteric arteriovenous fistula. The etiology in this case is unclear but congenital origin is suggested, and until now no cases have been reported as inferior mesenteric arteriovenous fistula in Japan.

REFERENCES


