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Author(s)	小山, 和行; 林, 三進; 木暮, 喬 他
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Inferior Mesenteric Arteriovenous Fistula

—Report of a Case and Review of the Literature—

Kazuyuki Oyama, Sanshin Hayashi, Takashi Kogure,

Ken Hirakawa and Akira Akaike

Department of Radiology, University Branch Hospital, University of Tokyo

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下腸間膜動静脈瘻の1例報告と文献的考察

東京大学医学部附属病院分院放射線科

小山 和行 林 三進 木暮 喬
 平川 賢 赤池 陽

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腸間膜動脈支配域における異常動静脈交通には動静脈瘻と Angiodysplasia (動静脈奇形) とがある。

我々は腹部腫瘍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瘻および下腸間動脈本幹相当部に無血管性腫瘍、組織学的にいわゆる脂肪組織炎を認めた。動静脈瘻と脂肪組織炎との関連性について、組織学的、文献的、および既往歴について考察を行なったが、上直腸動脈支配域の動静脈瘻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瘻は先天性と考えられた。

動静脈瘻について文献上多く報告されているが、腸間膜動脈支配域における動静脈瘻の報告は27例がなされているにすぎない。その内訳をみる

と、上腸間動脈支配域が26例で、その成因としては医原性15例(腸管切除13例、試験開腹1例、胃切除1例)、銃創9例、刺創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。

症状としては腹部雑音、振戦、門脈圧亢進症、腹痛、下痢等が報告されている。

治療としては瘻管切開術、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瘻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瘻としては文献上第2例目(腸間膜動静脈瘻として28例目)、また本邦としては第1例目の下腸間膜動静脈瘻の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

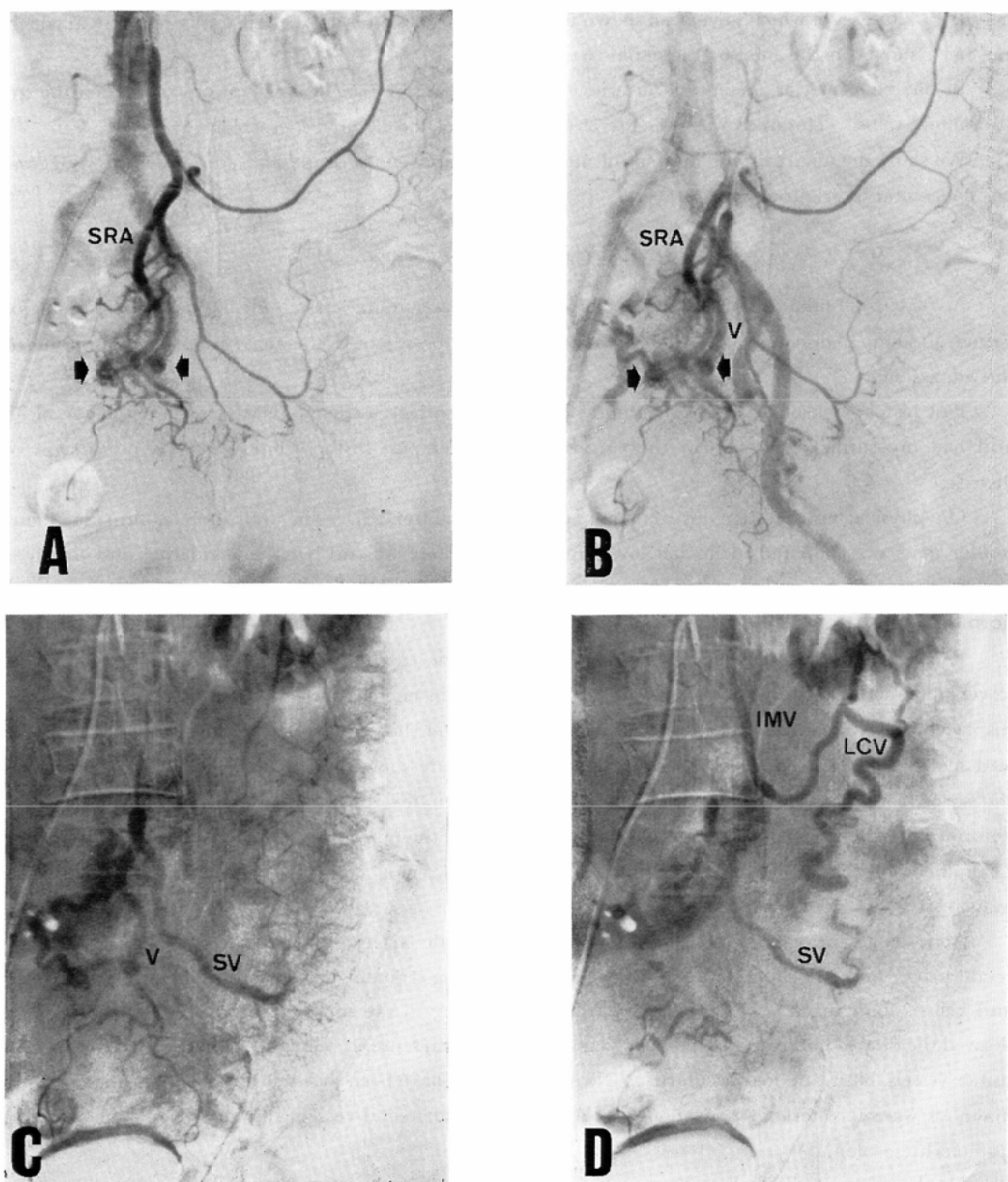


Fig. 1 Inferior mesenteric arteriogram showing arteriovenous fistula.

- 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⁾⁻²⁷⁾ 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.¹⁶⁾

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 hydronephrosis 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⁾²⁷⁾²⁸⁾ However, arteriovenous fistulas involving the mesenteric vessels are rare and 27 cases have been reported in the literature. In 1960 Movitz et al.¹⁾ 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 26 cases of the superior mesenteric vessels have been reported as follows; one case congenital;²⁰⁾ 16 cases iatrogenic;¹⁾⁻⁴⁾⁷⁾⁻¹¹⁾⁻¹⁵⁾¹⁷⁾¹⁹⁾²⁴⁾ and 10 cases traumatic⁵⁾⁶⁾¹²⁻¹⁴⁾¹⁸⁾²¹⁾⁻²³⁾ (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.²⁰⁾ The hemodynamic manifesta-

Table 1 Location of mesenteric arteriovenous fistulas

Location	Cases
Superior mesenteric artery	26
Main trunk	10
Jejunal branch	5
Ileal branch	4
Ileocolic branch	2
Middle colic branch	3
Right colic branch	2
Inferior mesenteric artery	2
Superior rectal branch	2*
Total	28

*Including author's case.

Table 2 Etiology of mesenteric arteriovenous fistulas

Etiology	Cases
Iatrogenic	16
Bowel resection	14
Laparotomy	1
Gastrectomy	1
Gunshot wound	9
Stab wound	1
Congenital	2*
Total	28

*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.⁵⁾¹⁰⁾¹⁹⁾²³⁾ However, some authors reported that high cardiac output states had been improved to normal after ligation of the fistula.¹²⁾²¹⁾²⁴⁾

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 at the communicating segment, and
3. early opacified and markedly dilated vein(s).

These angiographic findings are different from that of angiodysplasia²⁹⁾⁻³²⁾.

The vessels in the cases of mesenteric panniculitis are rarely involved and in some cases displaced and distorted vessels³³⁾ and vascular encasement³⁴⁾ 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.³⁵⁾⁻³⁷⁾ 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

- 1) Movitz, D. and Finne, B.: Postoperative arteriovenous aneurysm in mesentery after small bowel resection. *J.A.M.A.* 173: 42—44, 1960
- 2) Reams, G.B.: A middle colic arteriovenous fistula developing as a postgastrectomy complication. *Arch. Surg.* 81: 756—760, 1960
- 3) Munnell, E.R., Mota, C.R. and Thompson, W.B.: Iatrogenic arteriovenous fistula: Report of a case involving the superior mesenteric vessels. *Am. Surg.* 26: 738—744, 1960

- 4) Durham, M.W., Robnett, A.H., Harper, H.P. and Yekel, R.: Arteriovenous fistula of the mesenteric vessels. *West J. Surg. Obst. Gynec.* 70: 9—11, 1962
- 5) Rabhan, N.B., Guillenbeau, J.G. and Brackney, E.L.: Arteriovenous fistula of the superior mesenteric vessels after a gunshot wound. *New Engl. J. Med.* 266: 603—605, 1962
- 6) Sumner, R.G., Kistler, P.C., Barry, W.F. Jr. and McIntosh, H.D.: Recognition and surgical repair of superior mesenteric arteriovenous fistula. *Circulation* 27: 943—950, 1963
- 7) Steinberg, I., Tillotson, P.M. and Halpern, M.: Roentgenography of systemic (congenital and traumatic) arteriovenous fistulas. *Am. J. Roentgenol.* 89: 343—357, 1963.
- 8) Taylor, R.M.R., Douglas, A.P., Hacking, P.M. and Walker, F.C.: Traumatic fistula between a main branch of the superior mesenteric artery and vein. *Am. J. Med.* 38: 641—645, 1965
- 9) Currin, J.F. and Metcalf, B.H.: Postcolectomy arteriovenous fistula. *Am. J. Gastroenterol.* 46: 352—355, 1966
- 10) Grafe, W.R. and Steinberg, I.: Superior mesenteric arteriovenous fistula following small bowel resection. *Gastroenterol.* 51: 231—235, 1966
- 11) Ganshirt, L.W., Weaver, F.E. and Olander, G.A.: Mesenteric arteriovenous fistula. *Vasc. Surg.* 1: 82—86, 1967
- 12) Spellman, M.W., Mandal, A., Freeman, H.P. and Massumi, R.A.: Successful repair of an arteriovenous fistula between the superior mesenteric vessels secondary to a gunshot wound. *Ann. Surg.* 165: 458—463, 1967
- 13) Forbes, H.W., Thompson, C.Q. and Smith, J.W.: Mesenteric arteriovenous fistula after a gunshot wound. *J. Trauma* 9: 806—811, 1969.
- 14) Varner, J.E. and Oliver, R.I.: Superior mesenteric arteriovenous fistula. *Ann. Surg.* 170: 862—865, 1969.
- 15) Warter, J., Kieny, R., Gillet, B., Storck, D., Hoffmann N. and Haberer, J.P.: Fistule artérioveineuse mésentérique après résection partielle de l'intestin grêle. *Ann. Med. Interne.* 120: 185—191, 1969
- 16) Houdard, M.M.C., Helenon, C., Carles, J.F., Botella, R., Favre, M.M., Boulay, M.M.J. and Boschet, P.: Fistule artério-veineuse mésentérique inférieure et rectocolite ulcéreuse. *Arch. Franc. Mal. Appar. Dig.* 59: 463—474, 1970
- 17) Smith, R.B. and Stone, H.H.: Traumatic arteriovenous fistulas involving the portal venous system. *Am. J. Surg.* 134: 570—573, 1970
- 18) Tanenbaum, B., Pochaczewsky, R., Levowitz, B.S. and Richter, R.M.: Traumatic mesenteric arteriovenous fistula. *Br. J. Radiol.* 43: 726—729, 1970
- 19) Metzger, D.G., Hamilton, R.F. and Stephenson, D.V. Jr.: Mesenteric arteriovenous fistula. *Am. J. Surg.* 124: 767—769, 1972
- 20) Anderson, R.D., Liebeskind, A. and Lowman, R.M.: Arteriovenous fistula of the mesentery. *Am. J. Gastroenterol.* 57: 453—458, 1972
- 21) Brunner, J.H. and Stanley, R.J.: Superior mesenteric arteriovenous fistula. *J.A.M.A.* 223: 316—318, 1973
- 22) Bole, P., Andronaco, J.T. and Purdy, R.: Superior mesenteric arteriovenous fistula secondary to a gunshot wound. *J. Cardiovasc. Surg.* 14: 456—459, 1973
- 23) Nicholas, G.G. and Lane, M.F.: Traumatic superior mesenteric artery-superior mesenteric vein fistula. *J. Trauma* 14: 344—347, 1974
- 24) Paloyan, D., Collins, P.A. and Washburn, F.P.: Superior mesenteric arteriovenous fistula. *Am. Surg.* 40: 481—484, 1974
- 25) Casarella, W.J., Galloway, S.J., Taxin, R.N., Follett, O.A., Pollock, E.J. and Seaman, W.B.: "Lower" gastrointestinal tract hemorrhage: New concepts based on arteriography. *Am. J. Roentgenol.* 121: 357—368, 1974
- 26) Elkin, D.C. and Banner, E.A.: Arteriovenous aneurysm following surgical operations. *J.A.M.A.* 131: 1117—1119, 1946
- 27) Wakabayashi, T., Odagiri, H., Eguchi, T., Katayama, K., Ogai, T. and Yanagida, K.: Arteriovenous fistula of the superior mesenteric vessels after small bowel resection: Report of a case. (Japanese) *J. Med. Soc. Toho* 24: 292—297, 1977
- 28) Creech, O. Jr., Gantt, J. and Wren, H.: Traumatic arteriovenous fistula at unusual sites. *Ann. Surg.* 161: 908—920, 1965
- 29) Moore, J.D., Thompson, N.W., Appelman, H.D. and Foley, D.: Arteriovenous malformations of the gastrointestinal tract. *Arch. Surg.* 111: 381—389, 1976

- 30) Baum, S., Athanasoulis, C.A., Waltman, A.C., Galbabin, J., Schapiro, R.H., Warsham, A.L. and Ottingen, L.W.: Angiodysplasia of the right colon: A cause of gastrointestinal bleeding. *Am. J. Roentgenol.* 129: 789—794, 1977
 - 31) Miller, K.D. Jr., Tutton, R.H., Bell, K.A. and Simon, B.K.: Angiodysplasia of the colon. *Radiol.* 132: 309—313, 1979
 - 32) Oyama, K., Hayashi, S., Kogure, T., Hirakawa, K. and Akaike, A.: Abnormal arteriovenous communications of mesenteric vessels. —Report of a case of angiodysplasia and review of the literature— *Nipp. Acta Radiologica* 40: 835—844, 1980
 - 33) Diamond, A.B., Meng, C.H. and Goldin, R.R.: Arteriography of unusual mass lesions of the mesentery. *Radiol.* 110: 547—552, 1974
 - 34) Carillo, F.J., Ruzicka, F.F. Jr. and Clemett, A.R.: Value of angiography in the diagnosis of retractile mesenteritis. *Am. J. Roentgenol.* 115: 396—398, 1972
 - 35) Soergel, K.H. and Henaley, G.T.: Fatal mesenteric panniculitis. *Gastroenterol.* 51: 529—536, 1966
 - 36) Durst, A.L., Freund, H., Rosenmann, E. and Birubbaum, D.: Mesenteric panniculitis: Review of the literature and presentation of cases. *Surg.* 81: 203—211, 1977
 - 37) Ogden, W.W., Bradburn, D.M. and Rives, J.D.: Mesenteric panniculitis: Review of 27 cases. *Ann. Surg.* 161: 864—875, 1965
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