Delayed Rupture of Mycotic Hepatic Artery Aneurysm in a Patient with Infective Mitral Endocarditis-First Case in Korea

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ABSTRACT

Mycotic aneurysms of the hepatic artery are usually caused by mycotic infection in patients suffering with bacterial endocarditis. Mycotic aneurysms have become very rare recently due to early intensive antibiotic treatment for infective endocarditis. Despite of the non-specific symptoms, these aneurysms show a high possibility of sudden death if they ruptured. Therefore, early detection and surgical repair of aneurysms are very important. We report here on a case of hepatic artery mycotic aneurysm that presented as sudden shock and rupture. 

KEY WORDS : Hepatic artery ; Aneurysm ; Rupture ; Shock ; Endocarditis.

Introduction

Mycotic aneurysms are rarely complicated in patients suffering with infective endocarditis. The diagnosis can be difficult, and especially when the aneurysms are located in the deep vessels. The incidence of mycotic hepatic artery aneurysms has decreased, probably because of the early administration of effective antibiotics for infections.1) However, if not treated, these aneurysms are associated with a high possibility of rupture and extremely high mortality. 2) In Korea, mycotic aneurysms of the cerebral artery and superior mesenteric artery have been reported on.3)4) However, there have been no case reports about mycotic hepatic artery aneurysm.

We report here on a case of a 71-year-old woman who had a mycotic aneurysm of her hepatic artery along with infective endocarditis. She was successfully treated with an appropriate diagnosis and emergency surgical repair for sudden rupture of the hepatic artery.

Case

A 71-year-old woman visited the emergency room be-
of 1.9 mg/dL, an AST of 183 IU/L, an ALT of 117 IU/L, alkaline phosphatase of 200 IU/L and γ-GTP of 92 IU/L.

A 4×4 cm sized cystic mass was noticed adjacent to the liver on the abdominal ultrasound examination. A typical arterial pulse wave was detected within the cystic mass by color Doppler ultrasound (Fig. 2). Multidetector computed tomography (MDCT, Philips®, MX 8000 IDT 16, Netherlands) revealed a 4.4×4.1×5.2 cm sized mass with contrast enhancement at the arterial phase (Fig. 3) and a hepatic artery aneurysm was suspected. During the intensive care, she had been taken intravenous antibiotics and a vitamin K supplement. On the second in-hospital day, loss of the patient’s clear mentality and then hypotension occurred suddenly. The blood pressure decreased from 140/90 mmHg to 60/40 mmHg. The hemoglobin decreased as well, from 13.6 g/dL to 10.4 g/dL. After rapid intravascular volume replacement with crystalloid fluid and transfusion of packed red blood cells, the vital signs recovered with a blood pressure of 100/60 mmHg. Under the impression of sudden hypovolemic shock and rupture of the hepatic artery aneurysm, an emergency operation was performed with bedside Doppler ultrasound. The operative findings showed that there was a large amount of blood in the peritoneal cavity and a 3×3 cm sized common hepatic artery aneurysm with pulsatile bleeding. The aneurysmal sac was adhered to the adjacent tissue. There was a fistula between the aneurysmal sac and the common bile duct (Fig. 4). The gall bladder was perforated and filled with

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**Fig. 1.** Transthoracic echocardiographic findings of the magnified mitral valve showed a mobile echogenic mass (arrow) and an attached anterior mitral leaflet (A). The transesophageal echocardiographic findings showed irregular shaped vegetation (arrow) and prolapse before mitral valve replacement (B). LA: left atrium, LV: left ventricle.

**Fig. 2.** Ultrasound examination showed a pulsatile hypoechoic cystic mass in the liver (A) and the Doppler scanning demonstrated arterial blood flow in this lesion (B). The white arrow indicates the cystic mass and the white arrow head indicates the mural thrombus.

**Fig. 3.** Axial (A) and coronal CT scanning (B) showed a 4.4×4.1×5.2 cm sized aneurysm with a partially coagulated blood clot and strong contrast enhancement. The white arrows indicate the hepatic artery aneurysm and the arrow head indicates the mural thrombus.
blood. The operative procedures included aneurysme-
cotomy and end-to-end anastomosis with the autologous
right gastric artery, cholecystectomy and Roux-en-Y hep-
ticojejunostomy. After operation, her hemodynamic
condition became stable without any other symptoms.
She was discharged on the postoperative 28th day.

Discussion

The incidence of hepatic artery aneurysm follows
that of the most common splenic artery. Although
this still remains an uncommon vascular complication,
which was first reported by Wilson in 1819, the detection
rate has improved more in the recent 20 years rather
than the past: this probably reflects the wide spread
use of computed tomography(CT) scanning.

80% of hepatic artery aneurysms are extrahepatic
and 20% are intrahepatic. The common hepatic artery
is the most frequent location(63%), followed by the
right hepatic artery(28%), the left hepatic artery(5%),
and both hepatic arteries(4%).

The leading etiology is atherosclerosis in 32%
of these patients. The other causes are as follows: medio-
intimal degeneration in 24%, iatrogenic and external
trauma including biliary surgery or radiological inter-
vention in 22%, and mycotic infection in 10%. According
to the location, the intrahepatic aneurysms are in-
duced by iatrogenic or blunt external trauma, and the
extrahepatic aneurysms often develop at the anastomosis
sites created in liver transplantation. As for the less
common causes, mycotic aneurysms with bacterial endo-
carditis, polyarteritis nodosa, tuberculosis and inflam-
mation of the biliary tree have been reported. In this
case, the cause of the hepatic aneurysm was residual
biliary infection from the recent history of infective
endocarditis and gram positive bacterial sepsis.

Most patients with hepatic artery aneurysms have
no symptoms. They may present with upper abdomi-
nal pain or jaundice by extrinsic compression of the
common bile duct or intra-ductal occlusion by blood
clots. Quincke’s symptom triad of epigastric pain,
hemobilia and obstructive jaundice are observed in
one third of these patients. There is no specific phys-
ical abnormality. A palpable mass, bruit or hepatome-
galy may be present. The aneurysms may not be
diagnosed in 80% of patients until rupture occurs.
The frequent rupture sites are the peritoneal cavity(43%),
the biliary tree(41%), the gastro-intestinal tract(11%) or
the portal vein(9%).

Plain abdominal radiography often demonstrates ‘egg-
shell appearance calcifications’ in the right upper quad-
rant area. Color Doppler ultrasonography is the
modality of choice for screening. A pulsatile mass with
an arterial flow pattern is usually observed. MDCT
can well visualize the detailed anatomy of the visceral
arteries via three dimensional reconstruction of the ar-
terial phase. Conventional digital subtraction angiog-
raphy can be used to rule out other aneurysms through
selective catheterization of the celiac, renal, superior
and inferior mesenteric arteries.

Treatment options include surgical or endo-
vascular repair. Selection of the treatment modality depends on
the aneurysm location, the regional vascular anatomy,
the etiology and the combined disease of the aneurysm.
The proximal aneurysms at the origin of the gastro-
dodenal artery can be treated with ligation, excision or
aneurysmectomy. The distal aneurysms often require
surgical excision and repair with autologous tissue.
Surgical treatment with vascular reconstruction is always
recommended for the low risk patients. Embolization
is a less invasive alternative to surgical repair. This therapy
decreases the need for exploratory laparotomy and the
complications of general anesthesia. This has been
recently reported to be the most common therapeutic
modality for treating intrahepatic aneurysms. However,
this technique is associated with potential risks of hepatic
ischemia, liver abscess, cholecystitis and longterm con-
cerns about recanalization of the aneurysm.

Diagnosis of hepatic artery aneurysm is not often
prompt or even accurate without performing special
imaging studies. Although most of the symptoms are
non-specific, combined deep visceral artery aneurysms
should be always considered for patient suffering with
infective endocarditis. Doppler ultrasound, CT angio-
graphy and selective angiography are useful modalities
for screening for deep vascular aneurysms in patients
suffering with infective endocarditis. This report suggests
that early, accurate diagnosis can lead to appropriate
treatment for preventing sudden death from rupture
of aneurysms.

REFERENCES

1) Abbas MA, Fowl RJ, Stone WM, et al. Hepatic artery aneu-

![Fig. 4. The operative finding showed that aneurysm of the common hepatic artery was surgically exposed (arrow heads) and a fistula was formed from the aneurysm to the common bile duct (arrow).](image-url)


