Surgical Treatment of a Dissecting Aneurysm of the Proper Hepatic Artery: Report of a Case

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Primary dissecting aneurysms of the hepatic artery are extremely rare and only 15 cases, including the present case, have been reported in the literature. Surgery was performed in 5 cases, of which 3 cases were successfully treated. This report presents a case of a dissecting aneurysm of the proper hepatic artery that was successfully treated by aneurysmorrhaphy and vein patch angioplasty.

Keywords: aneurysm, dissection, hepatic artery

Introduction

Hepatic artery aneurysms are uncommon vascular lesions, with approximately 500 reported cases in the literature.1–3 True aneurysms account for three fourths of the reported cases, while false aneurysms for one fourth. Among all hepatic artery aneurysms, only 15 cases of dissecting hepatic artery aneurysms have been reported,2–4 of which 3 cases were successfully treated surgically.2,3 This report presents a rare case of a dissecting aneurysm of the proper hepatic artery that was successfully treated by aneurysmorrhaphy and vein patch angioplasty.

Case Report

A 60-year-old Japanese male was admitted to the Eniwa Midorino Clinic with a history episodic attacks of epigastralgia. There was no history of cholecystitis, pancreatitis, or abdominal injury due to a previous operation or trauma. A physical examination revealed that his abdomen was not tender and blood cell counts and other laboratory data were within normal limits. Abdominal computed tomography (CT) revealed a 30-mm aneurysm that was enhanced by contrast medium near the common hepatic artery (Fig. 1). Subsequent hepatic angiography was performed to identify the exact anatomic location of the aneurysm and a saccular aneurysm of the proper hepatic artery was diagnosed (Fig. 2a). The aneurysm was indicated for surgery because he did not have any risks to preclude operation.

The aneurysm was exposed through the lesser omentum via an upper midline incision and was located at the proper hepatic artery (Fig. 3a). After systemic heparinization, the distal proper hepatic artery, common hepatic artery and gastroduodenal artery were clamped and the aneurysm was incised longitudinally. The aneurysm was found to be a dissecting aneurysm (Fig. 3b). The intimal flap was resected and then the aneurysm wall was trimmed. Patch angioplasty was performed using an elliptical patch from the great saphenous vein (Fig. 3c). The ischemic time was 30 mins.
A histological examination of the aneurysm specimen showed medial degeneration of the wall.

The patient recovered from the operation without any major complications.

Postoperative digital subtraction angiography showed a patent proper hepatic artery (Fig. 2b). He was discharged from the hospital and has remained in good condition for a 2-year follow-up period.

Discussion

The hepatic artery is the second most common site for aneurysm formation within the splanchnic circulation, accounting for 20% of all splanchnic arteries.\(^5\) The etiology of true aneurysms is mostly associated with medial degeneration and secondary atherosclerosis, while that of false aneurysms are secondary to either a blunt or penetrating traumatic injury, or unrecognized iatrogenic injury within the liver. The etiology of dissecting aneurysms is unknown but possibly associated with medial degeneration, as suggested by the current case. The natural course of hepatic artery aneurysms leads to rupture and hemorrhage, with a high rate of morbidity and mortality. Rupture has been reported in 44% of patients with hepatic artery aneurysms.\(^7\) The mortality associated with rupture continues to be exceedingly high and is not less than the 35% previously reported.\(^8\) Therefore, an aggressive approach to managing all hepatic artery aneurysms is justified unless unusual risks preclude operation.

Surgical options for hepatic artery aneurysms are predominantly determined by their anatomic locations. Preoperative selective angiography of the celiac and superior mesenteric artery or CT angiography is recommended to delineate the potential anatomic variations.\(^9\) Common hepatic artery aneurysms can be usually ligated or resected without arterial reconstruction. Collateral circulation to the liver through the gastroduodenal and right gastric branches frequently provides a sufficient blood flow despite interruption of the common hepatic artery. Aneurysms of the proper hepatic or proximal right or left hepatic arteries require restoration of normal hepatic blood flow. Small saccular and
false aneurysms can be treated by aneurysmorhaphy with or without a vein or prosthetic patch. A patch graft can heal by a combination of pannus extension from the arterial wall and by ingrowth from the peri-graft tissue irrespective of the graft material, thereby resulting in satisfactory long-term patency. Fusiform and large saccular aneurysms that involve a greater circumference require resection and autogenous vein or prosthetic graft replacement. Interposition grafts within the hepatic arterial circulation are often possible, and when not, an aortohepatic bypass may be undertaken.\(^\text{10}\)

Endovascular treatment for hepatic artery aneurysms is emerging as an alternative option to open surgical procedures.\(^\text{3}\) Common hepatic artery aneurysms are candidates for percutaneous coil embolization, while aneurysms of the proper hepatic or proximal right or left hepatic arteries can be candidates for exclusion using a covered endoprosthesis.\(^\text{11}\) However, the latter is perceived as difficult due to limited commercial availability of suitably sized covered endoprostheses.\(^\text{12}\)

Only 15 cases of dissecting hepatic artery aneurysms, including the present case, have been reported so far. Surgery was performed in 5 cases, of which 3 cases were successfully treated. Pinkerton et al. reported the first successful case in which the aneurysm was resected and replaced with a polyester graft.\(^\text{4}\) Nakamura et al. reported the second case in which the aneurysm was found incidentally during a preoperative workup for hepatic metastatic tumor, where upon hepatic artery reconstruction and an extended right hepatectomy were performed.\(^\text{2}\) In the present case, the aneurysm was small and saccular and was successfully treated by aneurysmorhaphy with a saphenous vein patch, which was durable after a 3-year follow-up.

**Disclosure Statement**

We have no financial or other interest in the manufacture or distribution of any devices.

**References**

