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Hepatic artery aneurysm causing gastrointestinal haemorrhage – Case report and literature review

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ABSTRACT

INTRODUCTION: True hepatic artery aneurysms (HAAs) are rare, and when complicated by gastrointestinal haemorrhage, it becomes an even rarer disease entity. The mortality is high and imaging may fail to provide the diagnosis. We present a case of a true hepatic artery aneurysm complicated by a fistula to the duodenum which was first recognised during surgery.
PRESENTATION OF CASE: A 77-year-old man presented with upper gastrointestinal haemorrhage. Upper endoscopy revealed an ulceration in the duodenal bulb, which was refractory to endoscopic treatment. Computed tomography and angiography did not reveal the source of haemorrhage and as such, the diagnosis was delayed, until laparotomy was performed. Resection of the HAA and graft placement resulted in complete haemostasis.
DISCUSSION: True hepatic aneurysms communicating with the gastrointestinal tract have only been presented in case reports and short case series. Arteriosclerosis is a relatively common risk factor, but the underlying pathology is unknown. Meanwhile, gastrointestinal haemorrhage is a symptom of other, more common diseases in the gastrointestinal tract, and these factors, complicate the diagnostic workup.
CONCLUSION: In the case of treatment refractory duodenal haemorrhage, a visceral aneurysm should be considered. Even though angiography is performed, a HAA may remain undetected due to bleeding cessation. Improved computed tomography modalities could aid in the detection of gastrointestinal haemorrhage from HAAs, and ensure timely treatment by endovascular methods or surgery if the diagnosis is kept in mind in the initial evaluation.

1. Introduction

Hepatic artery aneurysms (HAAs) are rare, with an estimated incidence of 0.002-0.4% [1,2]. HAAs are thought to account for 20% of visceral aneurysms, making it the second most common after splenic artery aneurysms [2]. However, increased use of abdominal CT scans and therapeutic biliary procedures have increased the detection of at least pseudo HAAs [3]. Symptoms of a HAA range from abdominal pain (55%) to total lack of symptoms (2%). The number of asymptomatic cases may however be underestimated [3].

True HAA's communicating with the GI tract are only described in few case-reports. The Medline database was searched for potential articles using the MESH terms "hepatic artery", "aneurysm", and "gastrointestinal haemorrhage". A total of 187 articles were published from 1964 until 2014. Eighty-eight articles described pseudo-aneurysms or aneurysms arising from other arteries in the upper abdomen. The articles [4–34] on HAAs communicating with the GI-tract or the biliary system are presented in Table 1.

Fistulas from HAAs usually communicate with the biliary system. According to our literature search, a HAA with a fistula to the duodenum, has only been presented in seven previous studies/case reports. HAA present a diagnostic challenge due to the rarity of the disease with a variety of treatment options.

We present a case of a HAA complicated by a duodenal fistula. The case-presentation is made in full accordance with the current guidelines for surgical case reports (SCARE) [35].

2. Case presentation

A 77-year-old male with known hypertension (treated with bendroflumethiazid, amlodipine, and losartan), moderate daily alcohol consumption, and massive tobacco consumption, was admitted with hematemesis. Initial upper endoscopy did not reveal the bleeding source, and he was therefore managed conservatively. On the third day of admission, he developed a circulatory collapse.

Abbreviations: HAA, hepatic artery aneurysm; GI, gastrointestinal; CT, computed tomography.

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Table 1
True aneurysms of the hepatic artery and gastrointestinal haemorrhage.

Reference	Article type	No. of cases	Patient age	Location of fistula	Diagnostics	Treatment	Cause
Mortimer and Gresham [6]	Case report	1	77	NA	Autopsy	Laparotomy	NA
Graham et al. [5]	Case report	1	61	Portal vein	Angiography	Surgical resection	Heriditary telangiectasia
Macdonald et al. [7]	Case report	1	52	Gallbladder	Laparotomy	Surgical resection	Cholecystitis
Gryboski and Clemett [8]	Case report	1	18 weeks	NA	Autopsy	NA	Congenital
Sandblom [9]	Case report	1	73	Pancreatic duct	Angiography	NA	NA
Gupta and Cope [10]	Case report[α]	1	30	Common bile duct	Angiography	Surgical ligation	Endocarditis
Santiago-Delpin et al. [11]	Case report	1	48	Common bile duct	Laparotomy	Surgical resection partial	Marfan syndrome
Croom et al. [12]	Case report	1	73	Common bile duct	Agiography	Surgical resection	NA
Balthazar [13]	Case report[α]	1	74	Common bile duct	Angiography	Surgical resection	NA
Harlaftis and Akin [14]	Case report and literature review	48	62[a]	Common bile duct[a] Gallbladder Cystic duct Peritoneal cavity Hepatic ducts Duodenum Unknown	Angiography[a]	Surgical ligation[a]	NA
Cranston and Smith [15]	Case report	1	83	Intestinal tract not otherwise specified	Angiography	Surgical resection	NA
Hügel et al. [16]	Case report	1	56	Duodenal bulb	Angiography	Surgical resection	NA
Stierli et al. [17]	Case report	1	51	Pancreatic duct	NA	Surgical resection	Giant cavernous hemangioma
Psathakis et al. [18]	Case report[αβ] and literature review	2	64–70	Abdominal cavity Gallbladder and cholecystic fistula	Laparotomy	Surgical resection	NA
Werner and Bonnevie [4]	Case report	1	73	Pancreatic duct	Angiography	Surgical resection, bypass grafting	NA
Hubloue et al. [19]	Case report and literature review	1	74	Duodenal bulb	Angiography	Surgical resection	Acromegaly
Sarkar et al. [20]	Case report[α]	1	65	Common bile duct	Angiography	Embolisation	NA
Pross et al. [22]	Case report	1	56	Duodenal bulb	Angiography	Surgical ligation	Intrahepatic artery chemotherapy
O'Driscoll et al. [21]	Literature review	1	35	Common bile duct	Angiography	Embolization metal coils	NA
Cho et al. [23]	Case report	1	49	Duodenal bulb	NA	Surgical resection	NA
Maralcan et al. [24]	Case report [α,β,δ]	1	65	Bile system not otherwise specified	Angiography	Surgical ligation	NA
Shuster et al. [25]	Case report	1	21	Duodenal bulb	Angiography	Surgical resection, and venous grafting	Polyarteriitis nodosa
Narula et al. [26]	Case report	1	85	Unknown	Angiography	No treatment	NA
Traversa et al. [27]	Case report	1	49	Common bile duct	Angiography	Embolisation metal coils	NA
Morisawa et al. [28]	Case report[α]	1	83	Common bile duct	Angiography	Embolisation metal coils and gelatine sponge	NA
Soon et al. [29]	Case report	1	43	Gall bladder	CT	Embolisation metal coils	Endocarditis
Papafragkou et al. [30]	Case report	1	74	Stomach	CT	Surgical resection	NA
Wu et al. [31]	Case report	1	50	Common bileduct	CT	Embolisation metal coils and *N*-butyl cyanoacrylate	Fibromuscular dysplasia
Huisman et al. [32]	Case report	1	48	Duodenum	CT	Surgical suture laparotomy + Stent placement	NA
Kobayashi et al. [33]	Case report	1	77	Duodenum	CT	Stent placement	NA
Komatsu et al. [34]	Case report[α]	1	53	No direct fistula could be found	CT	Surgical resection	Marfan syndrome

Note: Unless otherwise specified, the aneurysm was from the common hepatic artery. NA = Not available. CT = Computed Tomography.
[a] Data on the one patient from the case report. Ages from the literature review is not specified.
[α] Right hepatic artery.
[β] Left hepatic artery.
[δ] Abberant right heptic artery.

Acute upper endoscopy, was conducted, revealing an arterial bleeding in the second part of the duodenum. Endoscopic intervention failed to induce bleeding cessation, and subsequent angiography did not reveal a bleeding source (Fig. 1).

Despite subsequent embolization of the gastro-duodenal artery, the patient had another circulatory collapse, prompting acute laparotomy. During surgery, an aneurysm of the common hepatic artery with a fistula to the duodenal lumen was discovered. The aneurysm was resected, and a vascular prosthesis from the celiac trunk to the common hepatic artery was attached (Figs. 2–3). The treatment resulted in complete haemostasis. The post-operative