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Case Report

Aortoduodenal Syndrome: Case Report and Review of the Literature

Gianluca Massaini[1]*, Nicola Troisi[2], Carlo Pratesi[1] and Stefano Michelagnoli[3]

[1]Department of Vascular Surgery, University of Florence, Italy

[2]Vascular Surgery Unit, Department of Translational Research and New Technologies in Medicine and Surgery, University of Pisa, Italy

[3]Department of Surgery, Vascular and Endovascular Surgery Unit, San Giovanni di Dio Hospital, Florence, Italy

***Corresponding Author:** Gianluca Massaini, Department of Surgery, Vascular and Endovascular Surgery Unit, Careggi Hospital, University Florence, Italy.

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Abstract

Objectives: Aortoduodenal syndrome is a rare clinical condition with duodenal obstruction caused by an abdominal aortic aneurysm (AAA). We report the case of a 60-year-old patient with aortoduodenal syndrome successfully treated by means of open repair.

Methods: A 60-year-old man with history of smoking and hypertension came to Emergency Department after a prolonged emesis (about 7 days). Direct computed tomography (CT)-scan detected a 9.2-cm infrarenal AAA with compression of the third part of duodenum. Acute renal failure and bowel occlusion were diagnosed and managed.

Results: Patient underwent open surgery. Surgical team included a visceral surgeon. An aortic standard repair was performed with a 20-mm Dacron tube graft. No bowel surgery was needed. 6-month CT-scan revealed a successful repair with no sequelae.

Conclusions: Open repair seems to be a good option in aortoduodenal syndrome management. Prompt management of clinical signs and symptoms is crucial to obtain successful outcomes.

Keywords: Abdominal Aortic Aneurysm; Aortoduodenal Syndrome; Duodenal Obstruction

Introduction

Aortoduodenal syndrome is a rare clinical condition [1]. Morphological finding is usually a large abdominal aortic aneurysm (AAA) with compression of the duodenum [2-6]. It is a clinical feature quite different from inflammatory AAA or superior mesenteric artery compression.

Clinical presentation is usually prolonged emesis; in addition, patient is frequently dry with weight loss [3,4]. Clinical examination of abdomen mostly reveals a pulsatile mass.

After high index of suspicion, the diagnosis has usually made with computed tomography (CT) scans [5,6]. In most cases diagnostic imaging detects a stomach expansion with levels and duodenum stenosis/occlusion due to compression related to a huge AAA. Diagnosis could be enhanced by using endoscopy [7].

In Literature few cases have been described. Treatment commonly starts with correction of fluids and electrolytes disorders. Bowel decompression followed by open surgical AAA repair have been usually reported. In the last years some authors preferred mini-invasive endovascular AAA repair [8-11].

We report the case of a 60-year-old patient with aortoduodenal syndrome successfully treated by means of open repair.

Case Report

A 60-year-old man with history of smoking and hypertension

came to Emergency Department after a prolonged emesis (about 7 days). Physical examination detected an abdominal pulsatile mass. Peripheral pulses were palpable. Patient had no history of previous abdominal surgery or small bowel obstruction.

Patient was dry. A naso-gastric tube was quickly placed. About 3200 cc of bilious fluid was drained. Blood tests revealed acute kidney failure: eGFR 11.54 mL/min, creatinine serum value 5.92 mg/dL, urea nitrogen 254.6 mg/dL. Direct CT-scan revealed a 9.2-cm infrarenal AAA with compression of the third part of duodenum (D3) and consequent stomach expansion (Figure 1). No signs of rupture or thrombus fissuration have been detected. Patient had neither fever nor abdominal pain. Parameters including arterial pressure were stable.

Figure 1: Direct CT-scan: 9.2-cm AAA and stomach expansion with levels.

First of all, nephrologists decided for intravenous fluid therapy in order to obtain a correction of fluid and electrolyte disorders.

After two days blood exams revealed improvement of renal function (creatinine serum value 4.0 mg/dL) and a CT-scan with contrast medium was performed (Figure 2). No superior mesenteric artery compression or hernia were detected. No other diagnostic tests have been performed. A diagnosis of aortoduodenal syndrome was made.

After seven days blood exams improved (creatinine serum value 2.23 mg/dL). Patient underwent open surgery. Surgical team included a visceral surgeon. A careful preparation through a midline laparotomy was obtained. No adhesive bands were lysed. Intraoperative evidence of compression of the third part of the duodenum (D3) by means of AAA was found. Intraoperative findings of inflammatory AAA were not found. Bowel was moved to the right intra-abdominal side and posterior peritoneum was opened. No aortoduodenal fistula has been found. No bowel lesion has been detected or caused. A standard repair was performed with a 20-mm Dacron tube graft (Figure 3).

Figure 2: CT-scan with contrast medium (blue narrows indicate compression of third part of duodenum, D3).

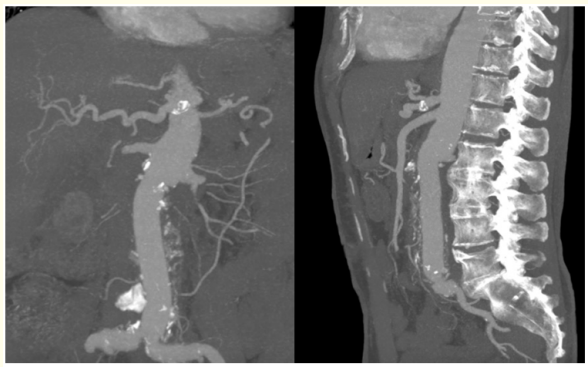

Figure 3: Intraoperative findings: adhesion of third part of duodenum (D3) to AAA with fibrous bands in absence of fistulas or bowel lesions (left side) and huge thrombus with standard open repair (right side).

In the postoperative period enteral nutrition was set up for 3 days. In addition, prokinetics were administered until fifth postop-

erative day when the complete bowel canalization was obtained. On 7th postoperative day patient was successfully discharged at home.

6-month follow-up CT-scan revealed no surgical sequelae with good patency of the aortic graft, no anastomotic lesions, and absence of stomach expansion (Figure 4).

Figure 4: 6-month follow-up CT-scan: patency of aortic tube graft with no surgical sequelae.

Discussion

Aortoduodenal syndrome is a rare entity[1]. Until 2018 Clarke., *et al*. [12] reported 30 cases in Literature. From 2018 to date, 7 additional cases have been described [4-7,11].

About clinical findings, the most reported symptoms were emesis (92%), pulsatile abdominal mass (71%), abdominal pain (58%), weight loss (54%) and electrolyte disorders (46%) [3].

Aortoduodenal syndrome is quite different from inflammatory AAA and superior mesenteric artery compression syndrome, although duodenal compression could be present in all these clinical findings. In the aortoduodenal syndrome, duodenum could present adhesions accountable for duodenal entrapment but not with inflammatory pattern. Clarke., *et al.* [12] hypothesized the potential protective role of the adhesions against aortic rupture.

This syndrome could lead to several morbidities (ab ingestis pneumonia, renal failure, aortoduodenal fistula, aortic rupture, etc.). In recent years mortality for elective repair of aortoduodenal syndrome became similar to that for elective aneurysm repair. This is due to the improvement of preoperative fluid resuscitation, operative techniques and postoperative care [3].

Standard treatment is open aortic aneurysm repair with median laparotomy, because of a better operative management of a complex anatomical situation. In addition, laparotomy could offer the possibility to reallocate the duodenum in the right position and to perform a gastrointestinal anastomosis if necessary (e.g. gastrojejunostomy) [7]. This surgical option could be considered when aorta has already been treated [12].

Endovascular aortic repair (EVAR) is not a first-line option because it could not remove the aneurysm but only provide a slow shrinkage of the sac if successful [8-11,13]. Ahn., *et al.* [9] described a case of aortoduodenal syndrome in a patient who underwent sigmoidectomy followed by colostomy for a sigmoidovescical fistula. In this case, open surgical access was strictly contraindicated because of high risk of infection. Therefore, this patient underwent EVAR. A reduction of volume was not recorded, but a reduction of the sac pressure was obtained and the duodenal obstruction was solved.

In addition, Franga., *et al.* [14] described a ruptured AAA causing aortoduodenal syndrome. Open surgical repair was performed with subsequent improvement of symptoms.

In our case the patient was significantly young (60-year old) and the onset of symptoms lead to detect a large and previously unknown AAA. No history of previous abdominal surgery was present. If asymptomatic, the aneurysm would have remained undiagnosed with continuous growing. A microsomic body size made the aneurysm even more dangerous for the surrounding organs.

No signs of rupture or thrombus fissuration have been detected in the first CT-scan performed in the Emergency Department. On the basis of the second CT-scan with contrast medium the diagnosis was clear and we decided to not perform other diagnostic tests. The operation was not performed in an urgency setting. Therefore, we had time to review the literature and to confirm our suspicion of aortoduodenal syndrome based only on the images of CT-scan.

On the other hand, stomach expansion and renal failures were the main obstacles to acute/emergent surgery. In our case, fluid resuscitation and nasogastric tube were essential to improve the possibility to have successful outcomes after open surgical repair.

Conclusion

Aortoduodenal syndrome is poorly known because of its rarity. Clinical and imaging patterns are well defined. Open repair still

seems to be a good option. Prompt management of clinical signs and symptoms is crucial to obtain successful outcomes.

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Conflict of Interest

Authors declared that there is no conflict of interest.

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