



Benign Blockage: Gastric Outlet Obstruction due to a Prolapsing Gastric Pedunculated Polyp—Case Report and Literature Review

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Abbreviations

WBC	White blood cells
Hgb	Hemoglobin
CRP	C-reactive protein
PPIs	Proton pump inhibitor
EUS	Endoscopic ultrasonography
HFUPS	High-frequency ultrasound probe sonography
ESD	Endoscopic submucosal dissection
MI	Myocardial infarction
NPO	Nihil per os
IV	Intravenous
EGD	Esophago-gastro-duodenoscopy

Case Report and Evolution

An 89-year-old woman was admitted to the emergency department at “Ospedale Civile Umberto I” in Lugo (Ravenna) for 1 month of vomiting, mild epigastric pain, and postprandial diarrhea without fever. Main comorbidities included chronic atrial fibrillation treated with a direct-acting oral anticoagulant, previous MI, hypertension, diabetes, and hypercholesterolemia, though despite her age the patient was autonomous in her daily activities. On admission, laboratory tests included normal WBC count, Hgb, and CRP. Abdominal X-ray demonstrated a stomach filled by ingested food (Fig. 1a) and diffuse air–fluid levels accompanied by

abdominal distension (Fig. 1b). A surgical consultation was requested; a CT scan was performed confirming gastric distension by ingested food (Fig. 2).

Since gastric outlet obstruction was suspected, the patient was hospitalized in a medical unit, treated with NPO and IV fluids. After 2 weeks, a second surgical consultation was requested due to the recurrence of clinical symptoms with unchanged laboratory tests. An upper GI series reported normal gastric and duodenal transit (Fig. 3) while colonoscopy was negative. The patient underwent EGD that showed a 4-cm pedunculated polyp situated in the gastric antrum; the polyp prolapsed into the duodenal bulb creating a “ball valve”-type intermittent obstruction. Biopsy was consistent with a hyperplastic polyp which was endoscopically resected (Fig. 4a–c). The final histological report confirmed a benign lesion; the patient was discharged from the hospital without any further invasive treatment in good general condition.

Discussion

Gastric polyps are either sessile or pedunculated lesions originating in the gastric epithelium or submucosa and protruding into the lumen. Though polyps are usually asymptomatic, the widespread use of endoscopy has increased the detection of incidental lesions [1, 2] even in childhood [3]. Larger polyps can manifest with bleeding, iron deficiency anemia, abdominal pain, or gastric outlet obstruction. Since these lesions can have a malignant potential, all gastric polyps detected at endoscopy should be biopsied [4]. The WHO classification of gastric polyps remains controversial [5, 6].

Among benign gastric polyps, the most common include *fundic gland polyps* that can be sporadic [7–12], associated with the long-term use of PPIs [12–16] or related to familial syndromes [17]; *hyperplastic polyps* that constitute > 90% of benign gastric polyps [18]; and *adenomas* that are true neoplasms and precursors of gastric cancer [19, 20]. Gastric

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Fig. 1 **a** Abdominal X-ray at admission showing stomach filled by ingested food (red arrow). **b** Abdominal X-ray at admission showing diffuse air–fluid levels (red arrow) with abdominal distension

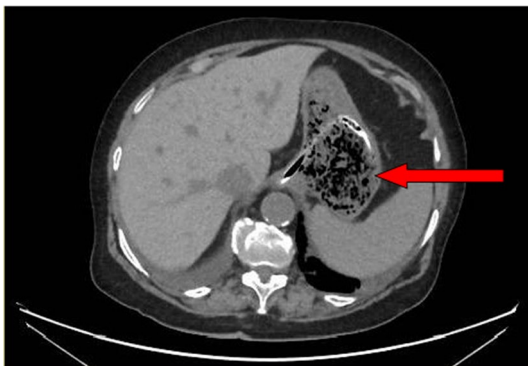
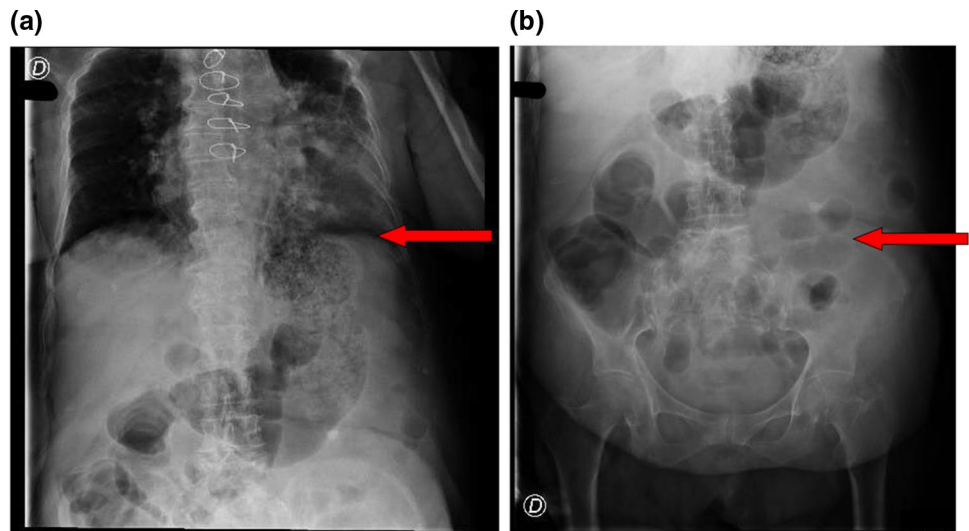


Fig. 2 Abdominal CT scan at admission confirming gastric distension due to ingested food (red arrow)

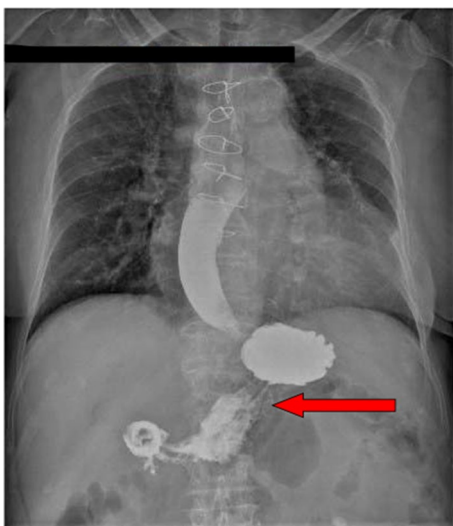


Fig. 3 Upper GI series showing normal gastric and duodenal transit (red arrow)

polyps can occur in precancerous conditions such as chronic atrophic gastritis, dysplasia, or intestinal metaplasia. EUS and HFUPS can accurately determine the depth of invasion in case of early gastric cancer [21], whereas ESD can often substitute for more aggressive surgical procedures [22].

A literature review identified other case reports describing “ball valve” gastric outlet obstruction due to gastric polyps of diverse histological types [Table 1]. Suzuki et al. found a large (3.5 cm) pedunculated polyp-shaped gastric cancer prolapsing into the duodenal bulb [22], whereas Miyake and coll described a 6-cm pedunculated polyp that intermittently obstructed the gastric outlet [23], both treated by ESD. Sone et al. reported a large pedunculated polyp prolapsing through the pylorus into the duodenal bulb, with the stalk arising from the greater curvature and extending beyond the angularis; thanks to air insufflation, the patient belched and the polyp suddenly fell back into the stomach [24]. Sooklal and coll identified a large polyp arising from the gastric cardia with a thick stalk and a bulky shape that had prolapsed into the duodenum [25].

Progressive gastric outlet obstruction is the most common symptom [26–32] even if, in some cases, it can be intermittent with vomiting and recurrent epigastric pain, often eluding ready diagnosis [33–40]. Rarely, polyps protrude distally, obstructing the ampulla of Vater, with subsequent dilatation of the common bile and main pancreatic ducts, another rare presentation that can include acute pancreatitis and biliary obstruction [41, 42].

In conclusion, gastric polyps are often asymptomatic and found incidentally at upper endoscopy performed for unrelated reasons. Although they are considered benign lesions, all symptomatic polyps should be removed in order to confirm histological diagnosis while resolving symptoms and preventing potential malignant transformation. In fact, simple gastric hyperplastic polyps and those with neoplastic

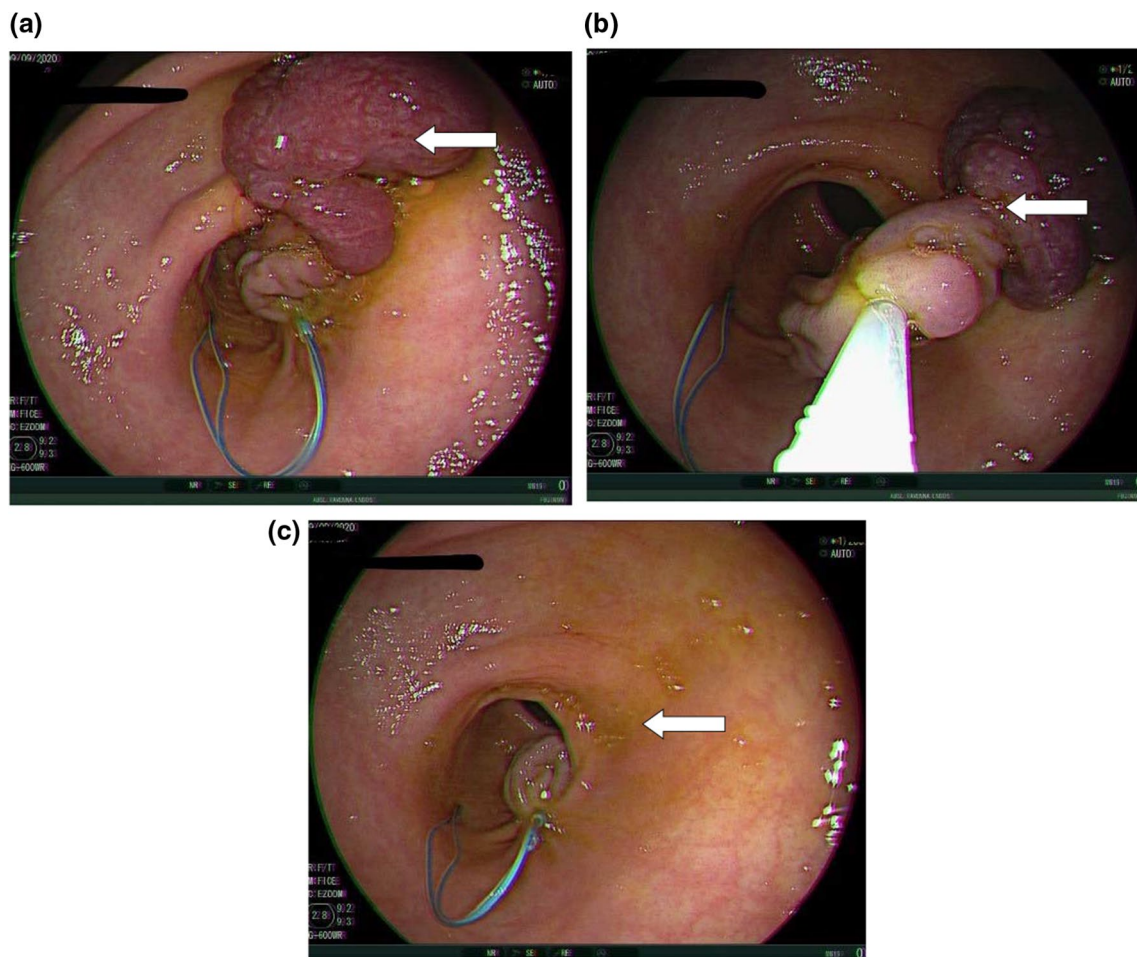


Fig. 4 **a** Upper gastrointestinal endoscopy showing a pedunculated polyp (white arrow). **b** Endoscopic resection of pedunculated gastric polyp (white arrow). **c** Final view of the endoscopic procedure—white arrow indicates the area of previous resection

transformation are indistinguishable in terms of number, location, and gross appearance [34].

In this case, gastric outlet obstruction was due to a 4-cm hyperplastic lesion, although most prolapsing polyps are <2 cm in diameter [7–9, 18]. Endoscopic resection with subsequent clinical observation relieved the symptoms and confirmed the diagnosis.

Key Messages

- Though gastric polyps are usually asymptomatic, they can have malignant potential. Therefore, all types of gastric polyps detected at endoscopy need to be biopsied or removed.
- Larger polyps can manifest with bleeding, anemia, abdominal pain, or gastric outlet obstruction.
- Though “ball valve” obstruction due to a polyp originating in the gastric antrum is not a common cause of gastric outlet obstruction, this etiology must be considered once the most frequent causes have been excluded.
- Appropriate management of gastric polyps depends on their histology, symptomatology, malignant potential, and comorbidities.

Table 1 Gastric polyps causing intermittent gastric outlet obstruction by a “ball valve” mechanism (n.a. = not available)

Literature (ref)	Polyp dimension	Histology	Treatment
Suzuki et al. [22]	3.5 cm	Early gastric cancer pT1a	ESD
Miyake et al. [23]	6 cm	Well-differentiated adenocarcinoma	ESD
Sone et al. [24]	3.8×3.6×2.1 cm	Hyperplastic polyp	Snare polypectomy
Sooklal et al. [25]	10 cm	Adenoma with low grade of dysplasia	ESD with the clip–snare method
Cerwenka et al. [26]	n.a	Hyperplastic polyp	Snare polypectomy
Yriberry Urena et al. [27]	n.a	Hyperplastic polyp	Endoscopic resection and argon plasma coagulation
Chen et al. [28]	6 cm	Hyperplastic polyp	Total removal
Dean et al. [29]	10×7×4.5 cm	Hyperplastic polyp	Laparotomic surgical resection
Aydin et al. [30]	2.5 cm	Hyperplastic polyp	Snare polypectomy
Burus et al. [31]	4 cm	Hyperplastic polyp with early gastric cancer foci	Endoscopic polypectomy + endoscopic follow-up
Lei et al. [32]	3 cm	Hyperplastic polyp	Endoloop-assisted electrosurgical polypectomy
Kumar et al. [33]	I) 8 cm II) 9×8 cm III) 2 cm IV) 3.5 cm	I) Adenoma II) Leiomyoma III) Hyperplastic polyp IV) Hyperplastic polyp	I) Endoscopic polypectomy II) Laparotomic surgical resection III) Endoscopic polypectomy IV) Endoscopic polypectomy
Pontone et al. [34]	n.a	Hyperplastic polyp	Endoscopic polypectomy with hydroxypropyl-methylcellulose
Kosai et al. [35]	4 cm plus multiple smaller satellite polyps	Hyperplastic polyp	Distal gastrectomy with Billroth 2 reconstruction
Parikh et al. [36]	2 cm	Hyperplastic polyp	Snare polypectomy
Sun et al. [37]	2.5 cm	Granulation tissue	Detachable snaring without polypectomy
Gencosmanoglu et al. [38]	3 cm	Hyperplastic polyp	Snare polypectomy with submucosal injection of diluted adrenaline
Freeman [39]	n.a	Adenoma complicated by adenocarcinoma	Endoscopic excision
Gashi et al. [40]	3 cm	Hyperplastic polyp	Endoscopic excision
De La Cruz et al. [41]	13 cm	Hyperplastic polyp	Laparotomic surgical resection
Jetha et al. [42]	8.8×4×3.7 cm	Adenoma plus foci of high-grade dysplasia	Laparotomic surgical resection

Compliance with Ethical Standards

Conflict of interest All authors declare that they have no conflict of interest.

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