Case Report

Ectopic Ampulla of Vater in the Pyloric Channel as a Rare Cause of Gastric Outlet Obstruction and Choledocholithiasis: A Case Report

Jamshid Vafaeimanesh[1,2*], Ahmad Kachoie[1], Mansoureh Shakeri[1], Somayeh Fallahi[1]

[1]Clinical Research of Development Unit, Shahid Beheshti Hospital, Qom University of Medical Sciences, Qom Iran
[2]Gastroenterology and Hepatology Diseases Research Center, Qom University of Medical Sciences, Qom, Iran

ABSTRACT

Rare anatomical anomalies of the ampulla of Vater can be associated with significant clinical complications, including gastric outlet obstruction and choledocholithiasis. This article reports a rare case of an ectopic ampulla of Vater located in the pyloric channel, with notable clinical consequences, and reviews similar findings in the literature.

A 75-year-old man presented with epigastric pain, nausea, and recurrent vomiting. Endoscopic and imaging findings revealed that the ampulla of Vater was ectopically located in the pyloric region. The patient subsequently underwent successful endoscopic intervention and recovered.

Ectopic ampulla of Vater (ectopic papilla of Vater) is a rare anomaly that can lead to symptoms such as pyloric obstruction, cholangitis, and choledocholithiasis. Accurate identification through advanced imaging and endoscopic techniques is crucial. A literature review revealed similar cases of this anomaly, often associated with delayed diagnosis and secondary complications.

Although the ectopic ampulla of Vater is rare, it should be considered in cases of unexplained biliary disorders. Timely diagnosis and appropriate treatment can prevent severe complications.

Keywords: Ampulla of Vater, Gastric outlet obstruction, Anatomic anomaly, Choledocholithiasis, Endoscopy, Ectopic location

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**Corresponding Author:*
Jamshid Vafaeimanesh, MD
Address: Qom, Shahid Beheshti Hospital, Qom University of Medical Sciences
Tel: + 98 2536122000
Fax: + 98 2536122855
Email: jvafaeemanesh@yahoo.com

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INTRODUCTION

The ampulla of Vater, the common drainage site of the common bile duct (CBD) and pancreatic duct, is normally located on the medial wall of the second part of the duodenum. Any ectopic positioning of this structure can lead to significant clinical consequences, including cholangitis, jaundice, choledocholithiasis, and even gastric outlet obstruction. This condition may result from congenital anomalies, developmental disorders during embryogenesis, or, in rare cases, surgical sequelae and chronic inflammation. Ectopic ampulla of Vater has been reported in various locations, including the duodenal bulb, gastric antrum, and pyloric channel, across different studies. Despite advances in imaging and endoscopic techniques, diagnosing papillary displacement remains challenging. Lack of awareness or insufficient consideration of this possibility may lead to unnecessary interventions (e.g., surgery) or delays in appropriate treatment. This article presents a case of ampulla of Vater ectopically located in the pyloric channel, highlighting the importance of accurate diagnosis and optimal treatment selection.

CASE REPORT

A 75-year-old man with a history of coronary artery disease presented to the hospital with complaints of right upper quadrant (RUQ) pain, nausea, recurrent vomiting, anorexia, and progressive jaundice. On initial examination, the patient exhibited abdominal tenderness in the right subcostal region and marked scleral icterus. Laboratory tests revealed elevated direct bilirubin (5.2 mg/dL), alkaline phosphatase (890 IU/L), and Gamma-glutamyl Transferase (GGT) (410 IU/L). Abdominal ultrasound and computed tomography (CT) demonstrated CBD dilatation with multiple stones.

Initial Endoscopic Findings

The first upper endoscopy revealed severe stricturing at the D1-D2 junction, preventing duodenoscope passage. Presumed secondary to severe inflammation and mucosal edema, the patient was placed on bowel rest and initiated on anti-acid therapy. A repeat endoscopy showed reduced inflammation but persistent failure to advance the scope, with no identifiable papilla.

Surgical Intervention

Due to refractory symptoms and unsuccessful endoscopic management, the patient underwent exploratory laparotomy. During cholecystectomy, the biliary ducts could not be clearly identified, prompting surgical drain placement near the suspected area. Postoperatively, the patient developed persistent bile leakage from the drain site despite supportive measures.

Definitive Management

A multidisciplinary decision was made to perform rendezvous endoscopic retrograde cholangiopancreatography (ERCP) via the surgical drain (Figures 1 & 2).

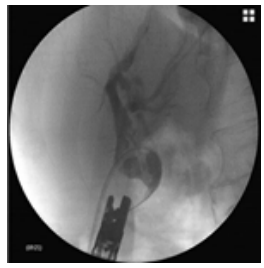

Figure1. Surgical drain being inserted into the bile duct by the surgeon is seen.

Figure1 Figure2

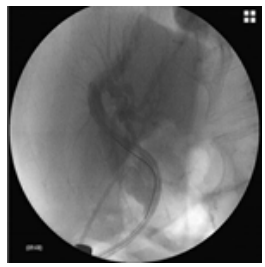

Figure2. a rendezvous ERCP was performed through the drain tract

ERCP Findings and Management

During ERCP, the endoscope was advanced through the surgical drain toward the pyloric region, where a papillary structure was identified within the pyloric channel. Contrast injection confirmed a common drainage channel for both the CBD and pancreatic duct. The biliary duct was markedly dilated and contained multiple calculi.

Therapeutic Intervention

A sphincterotomy was performed, followed by complete stone extraction using a balloon catheter. A double-pigtail stent was subsequently placed (Figure 3). Post-procedurally, the biliary leakage gradually resolved, and the patient's clinical status improved significantly.

Outcome

The patient was discharged after 7 days in stable condition with scheduled follow-up.

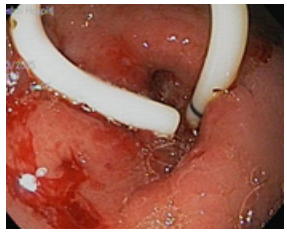

Figure3. Sphincterotomy, balloon dilation, and placement of a double-pigtail stent

DISCUSSION

Ectopic ampulla of Vater, defined as its displacement outside the normal duodenal wall location, represents a rare and underrecognized anatomical anomaly that poses significant diagnostic and therapeutic challenges in biliary and gastrointestinal disorders. This malformation carries substantial clinical importance as abnormal drainage of the bile and pancreatic ducts can lead to complex alterations in biliary flow, digestive function, and complications including cholangitis, pancreatitis, and gastrointestinal obstruction.

Embryologically, the formation of the ampulla results from intricate differentiation and fusion processes of the bile and pancreatic ducts within the duodenal wall. Disruption of these processes, particularly during early ductal development, may result in ectopic positioning or abnormal branching. The medical literature documents cases of papillary displacement to atypical locations, including the pyloric channel, gastric antrum, and various duodenal segments, with an estimated prevalence of < 1% in examined cases (1-3). Despite its rarity, the clinical consequences can be profound.

Diagnostic challenges constitute a critical aspect of ectopic ampulla. While standard upper endoscopy typically allows direct papilla visualization, ectopic locations - particularly when accompanied by inflammation, mucosal edema, or strictures - may lead to failed identification or misdiagnosis. This frequently results in delayed treatment and unnecessarily complex surgical interventions, imposing additional burdens on patients and healthcare systems.

Key findings from relevant studies include:

• Taş and colleagues (4) demonstrated in their 3000-patient cohort that ampullary ectopia occurs in <0.7% of cases, typically presenting with non-specific symptoms (abdominal pain, nausea, vomiting, obstructive signs). The study emphasizes considering ectopia in treatment-resistant cases with ambiguous endoscopic findings.

• Guerra and others (5) reported a pyloric channel ectopia case presenting with severe cholangitis, diagnosed only through advanced imaging, highlighting how anatomical variations complicate both diagnosis and management.

• Peng and co-workers (6) underscored the importance of early recognition in preventing diagnostic and therapeutic errors.

• Zhang and others (7) proposed associations between ampullary ectopia and gastroesophageal reflux disease (GERD)/upper gastrointestinal (GI) dysfunction, suggesting congenital biliary anomalies may predispose to chronic digestive disorders.

Our case presented with concurrent gastric outlet obstruction and choledocholithiasis. While pyloric channel ectopia did not directly cause the obstruction, it significantly complicated biliary duct identification, necessitating multiple failed endoscopies before rendezvous ERCP provided definitive management.

The rendezvous ERCP technique - combining surgical and endoscopic access - proved invaluable for this anatomical variant. By utilizing surgical drain access for contrast injection followed by fluoroscopic-guided endoscopic intervention, we achieved precise localization, sphincterotomy, and complete stone extraction with stent placement.

This case highlights:

1. The critical need for multidisciplinary collaboration between surgeons, gastroenterologists, and radiologists
2. The diagnostic utility of advanced imaging (magnetic resonance cholangiopancreatography [MRCP]/endoscopic ultrasound [EUS]) in anatomical variants
3. The importance of physician education regarding congenital/acquired pancreatobiliary anomalies to prevent misdiagnosis and unnecessary procedures

While rare, ampullary ectopia should remain a diagnostic consideration in refractory or atypical presentations. Continued education and research are essential to optimize diagnostic accuracy and therapeutic outcomes for these challenging cases.

CONCLUSION

Ectopic displacement of the ampulla of Vater to the pyloric region is a rare yet clinically significant phenomenon that can present with atypical and complex features. In patients with unexplained biliary or GI obstructive symptoms and failed conventional papilla identification, anatomical anomalies should be strongly considered.

The implementation of complementary diagnostic approaches, particularly rendezvous ERCP and advanced imaging modalities, can:

1. Prevent unnecessary surgical interventions
2. Facilitate accurate therapeutic planning
3. Improve overall patient outcomes

This case underscores the importance of maintaining a high index of suspicion for anatomical variants when evaluating refractory cases, while highlighting the value of multidisciplinary collaboration and tailored endoscopic techniques in managing these challenging clinical scenarios.

Footnotes

AUTHORS' CONTRIBUTION:

• J.V. and A.K designed and organized the study; M.SH, and S.F developed the first draft of the manuscript; All authors read and approved the final manuscript.

CONFLICT OF INTEREST:

• The authors declare no conflict of interest related to this work

DATA AVAILABILITY:

The database displayed within the study is accessible upon request from the corresponding author upon accommodation or after publication. The information is not freely accessible due to restrictions from the Research Institute.

ETHICAL APPROVAL:

This research has received ethical approval from the Research Ethics Committee of Qom University of Medical Sciences, bearing ID No IR.MUQ.REC.1404.113 Written informed consent in accordance with the Declaration of Helsinki and institutional approval have been obtained from all members involved in this study.

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INFORMED CONSENT:

Written informed consent was obtained from the patient.

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