

## Post Traumatic Perforated Duodenal Diverticulum: A Case Report

R. Essofi<sup>1\*</sup>, I. Azzahiri<sup>1</sup>, M. Benzalim<sup>1</sup>, S. ALJ<sup>1</sup>

<sup>1</sup>Radiology Department of Ibn Tofail Hospital, Mohamed VI University Hospital, Faculty of Medicine and Pharmacy, Cadi Ayyad University, Marrakech, Morocco

DOI: [10.36347/sasjm.2023.v09i11.021](https://doi.org/10.36347/sasjm.2023.v09i11.021)

| Received: 25.09.2023 | Accepted: 28.10.2023 | Published: 23.11.2023

\*Corresponding author: R. Essofi

Radiology Department of Ibn Tofail Hospital, Mohamed VI University Hospital, Faculty of Medicine and Pharmacy, Cadi Ayyad University, Marrakech, Morocco

### Abstract

### Case Report

Duodenal diverticulosis is second only to the colon as the most common location for diverticula. Despite typically being asymptomatic, it can lead to severe complications such as perforation, hemorrhage, and acute diverticulitis. Diagnosing duodenal diverticulitis is challenging due to its non-distinctive presentation and similarity to other intraabdominal conditions in radiographic images. This paper examines a challenging case of duodenal diverticulitis with post-traumatic perforation in a 63-year-old patient, admitted post-traffic accident with an acute abdominal pain revealing duodenal diverticulum rupture as per abdominal CT scan. Despite the complications and a Grade II compression fracture of the L3 vertebra, the patient showed improvement under observation without necessitating surgery. The study highlights the diagnostic complexities of duodenal diverticulitis and the importance of abdominal CT scans in identifying this rare and often misdiagnosed condition.

**Keywords:** Duodenal diverticulitis, Perforation, Traumatic, CT.

**Copyright © 2023 The Author(s):** This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC BY-NC 4.0) which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use provided the original author and source are credited.

## INTRODUCTION

The prevalence of duodenal diverticulosis is relatively high, ranging up to 23% depending on the diagnostic method used [1]. While diverticulum are more commonly found in the colon, the duodenum is the second most common location in the gastrointestinal tract. Typically, patients with duodenal diverticulosis are asymptomatic, but some complications might occur such as perforation, hemorrhage, obstruction, or acute diverticulitis. The diagnosis of duodenal diverticulitis can be particularly challenging, as its clinical presentation is not distinctive, and radiographic features may mimic other acute intraabdominal conditions. Prior to the advent of CT scans, diagnosis was often only made during surgery. In this report, we present a case of duodenal diverticulitis, complicated by a post-traumatic perforation and revealed by peritonitis.

## CASE REPORT

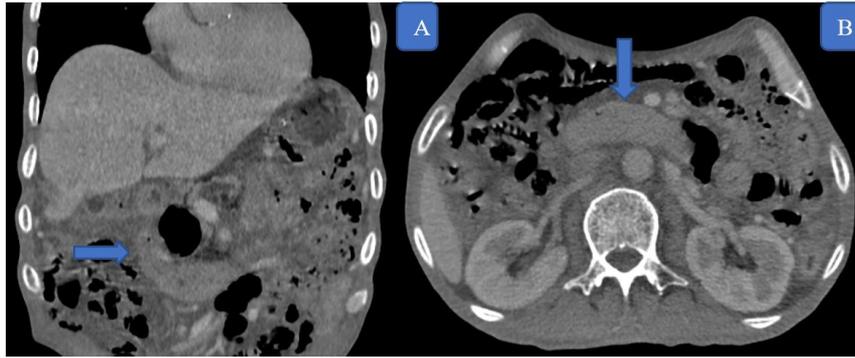
We report the case of a 63-year-old patient, with no particular pathological history, who arrived at the

emergency room following a traffic accident. The patient presented a reduction in mobility of the right lower limb, and upon clinical examination, a swollen right hip with exquisite pain on palpation. The patient underwent a hip x-ray, which showed a femoral neck fracture treated with osteosynthesis in the traumatology department.

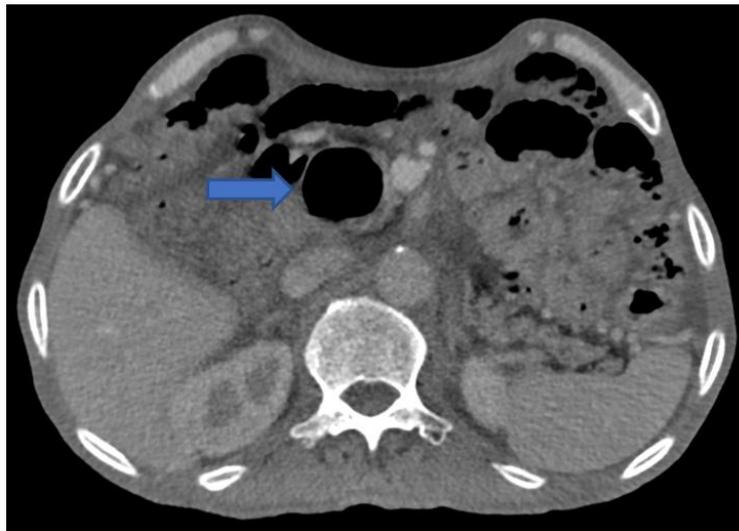
On the 2nd post-operative day, the patient presented with acute abdominal pain of sudden onset. He underwent an abdominal ultrasound, which revealed moderate peritoneal effusion, with no detectable post-traumatic lesion at the level of the liver, spleen, or pancreas. The patient, therefore, underwent further exploration with an abdominal CT scan.

### Imaging Findings

The abdominal CT scan revealed an image of para-duodenal air collection associated with a circumferential and regular wall thickening of the duodenum at the level of its D2, D3, and D4 portions and some jejunal loops.



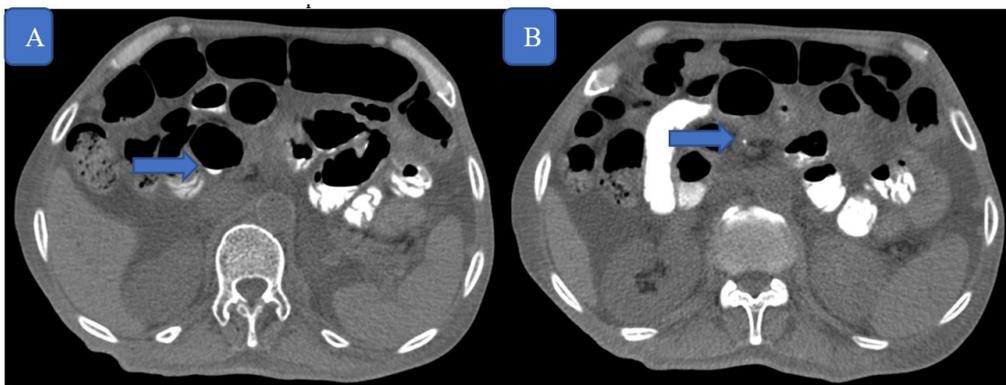
**Figure 1: Coronal (A) and axial (B) views of an abdominal CT scan showing a circumferential and regular wall thickening of the duodenum at the level of its D2 and D3 portions (blue arrow)**



**Figure 2: Axial view of an abdominal CT scan showing a para-duodenal air collection (blue arrow)**

After oral administration of contrast material, the CT scan showed opacification of the para-duodenal air collection confirming its connection with the duodenum.

The CT also revealed contrast leakage, peritoneal effusion and moderate bilateral pleural effusion, all those elements were in favor of the rupture of the duodenal diverticulum.



**Figure 3: Axial views of an abdominal CT scan showing opacification of the para-duodenal air collection confirming its connection with the duodenum (A, blue arrow), with contrast extravasation (B, blue arrow)**

On the bone window, a Grade II compression fracture of the L3 vertebra with posterior wall displacement was observed.

The treatment was conservative with clinical and biological monitoring; the course of the condition was characterized by both clinical and biological improvement.

## DISCUSSION

Perforated duodenal diverticulum is a rare and often clinically challenging condition to diagnose, particularly when it is a consequence of trauma. It's typically characterized by patients presenting with acute abdominal pain without clear peritoneal signs and is frequently misdiagnosed as acute cholecystitis, appendicitis, or perforated duodenal ulcer. A history of abdominal blunt trauma may raise suspicion of perforation, but symptoms may not appear until several days after the trauma.

According to a literature review published in *Acta Chirurgica Belgica* in 2015 [2], only 10 cases of traumatic duodenal diverticulum perforation were reported up to that point. It was found that only about 5% of patients with duodenal diverticula become symptomatic due to acute inflammation, perforation, hemorrhage, or obstruction. Traumatic rupture is often a consequence of an anteroposterior compression of the duodenum between the spine and abdominal wall. According to the literature data [2, 3], 90% of ruptured duodenal diverticula were located in the second portion of the duodenum and in all cases, no other post-traumatic abdominal lesions were found, these results are similar to those of our study.

On CT imaging, a duodenal diverticulum appears as a mass-like structure between the duodenum and the pancreatic head, containing air, fluid, contrast material, or debris. However, even with CT scans, the diverticulum may not always be identified. The patient's position during the exam, such as right lateral decubitus, may help in identifying the lesion. In cases where duodenal diverticulitis is suspected based on initial imaging, a repeat CT scan with thin collimation after oral administration of contrast material may better demonstrate characteristic findings [4].

Abdominal CT scan is the most useful diagnostic tool if a perforation of a duodenal diverticulum is suspected; as it can identify signs of perforation such as air bubbles, extraluminal fluid, retroperitoneal abscess, thickened bowel wall, and mesenteric fat stranding; the presence of extraintestinal contrast leakage is observed in only 26% of cases, likely due to the small size of the perforation or obstruction by surrounding tissue [5].

Some conditions that can mimic perforated duodenal diverticulitis on CT include pancreatitis with abscess, ascending retrocecal appendicitis, perforated duodenal ulcer, and traumatic duodenal rupture.

Correct preoperative diagnosis is uncommon, being made in only 13% of cases. The condition is usually accurately diagnosed during a laparotomy [6].

An exploratory laparotomy often serves as the decisive diagnostic measure when duodenal injuries are suspected.

The conservative treatment of perforated duodenal diverticula, typically using retroperitoneal percutaneous drainage, is rarely employed. Emerging procedures include endoscopic treatment strategies, which may incorporate clipping along with endoscopic retrograde cholangiowirsungography, optionally accompanied by percutaneous drainage. Surgical intervention remains the best standard of care; typically a laparotomy is the procedure of choice with a straightforward diverticulectomy, an optional epiploasty may be performed. The surgery concludes with a retroperitoneal drainage placed near the duodenal closure to detect any early anastomotic leaks. The installation of a feeding jejunostomy during the initial laparotomy is often suggested [2].

Even though perforated duodenal diverticulitis is traditionally treated surgically, there are studies suggesting that non-operative management can be an effective initial step for certain cases [1].

## CONCLUSION

The traumatic rupture of a duodenal diverticulum is a rare condition, which requires urgent surgical intervention and can be diagnosed through CT-scan imaging. The prognosis is positive provided prompt diagnosis and treatment are administered.

## RÉFÉRENCES

1. Aljabri, W. A., & Hasosah, M. (2020). Duodenal Diverticulosis as an Unusual Cause of Severe Abdominal Pain. *Cureus*, 12(9), e10586.
2. Majerus, B., & Mathonet, P. (2015). Traumatic Rupture of a Duodenal Diverticulum: Case Report and Review of the Literature. *Acta Chirurgica Belgica*, 115(4), 310–313.
3. Rossetti, A., & Buchs, N. C. (2013). Perforated duodenal diverticulum, a rare complication of a common pathology: A seven-patient case series. *World J Gastrointest Surg*, 5(3), 47–50.
4. Metcalfe, M. J., & Tanwir, G. R. (2010). Isolated perforation of a duodenal diverticulum following blunt abdominal trauma. *J Emerg Trauma Shock*, 3(1), 79–81.
5. Ames, J. T., & Federle, M. P. (2008). Perforated duodenal diverticulum: clinical and imaging findings in eight patients. *Abdominal Imaging*, 34(2), 135–139.
6. Novellas, S., & Karimjee, B. S. (2009). Aspects tomodensitométriques et signification du gaz dans l'aire pancréatique. *Journal de Radiologie*, 90(2), 191–198.