

## Firm Pancreatic Trauma in Children: About a Case

**Nourrelhouda Bahlouli\***, Fatima Chait, Khadija Laasri, Nazik Allali, Siham El Haddad and Latifa Chat

*Radiology Department, Pediatric Teaching Hospital, Mohammed V University, Rabat, Morocco*

**\*Corresponding Author:** Nourrelhouda Bahlouli, Radiology Department, Pediatric Teaching Hospital, Mohammed V University, Rabat, Morocco.

**Received:** October 11, 2023; **Published:** November 07, 2023

### Abstract

Closed trauma of the pancreas is the fourth injury of solid organs in children. These are lesions with difficult diagnosis. They are the cause of many complications. The purpose of our work is to report through a case admitted to our service, the different radiological signs pointing to pancreatic trauma, illustrate the classifications of lesions of the duodeno-pancreatic block in children. The complications are numerous and should be looked for in control imaging. The treatment of pancreatic trauma is very controversial, conservative management is the rule except in major lesion with ductal involvement.

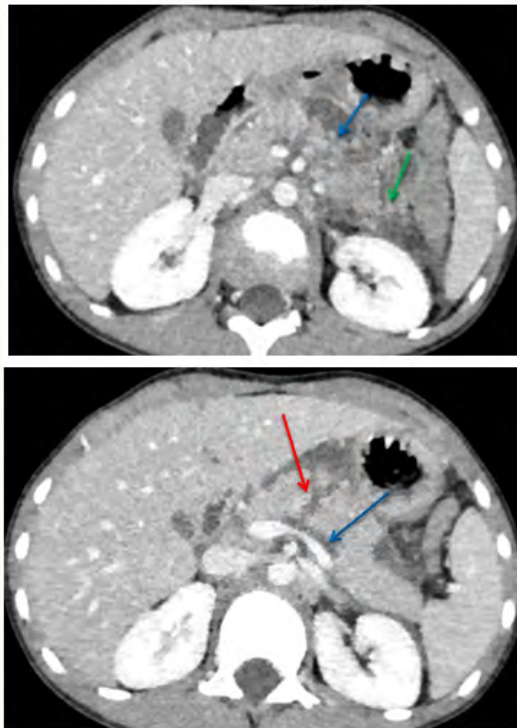
**Keywords:** *Isolated Pancreatic Trauma; Children; Firm Trauma*

### Introduction

Closed trauma to the pancreas is rare, especially if it is an isolated trauma of the pancreas (TIP). These are severe traumas with a mortality rate of 5 to 30% [1]. They constitute 3% to 12% of all abdominal trauma in children. Some are unknown and are discovered only late in the complication stage.

### Case Report

An 8-year-old child, without particular ATCD who presents to the emergency room for abdominal trauma closed to H10, and who complains of epigastric abdominal pain. The patient was stable on all fronts with no other signs of clinical appeals. Biologically lipasemia was at 1953 U/L and amylasemia at 1596 U/L. An initial ultrasound was performed showing a peritoneal medium abundance effusion. Abdominal CT objective an isolated pancreatic trauma with enlarged pancreas, with loss of its lobulations, which is seat of a complete AAST IV corporal fracture, with a homogeneous enhancement of the rest of the parenchyma. It is associated with an infiltration of peri-pancreatic fat, a peri-pancreatic fluid effusion between the splenic vein and the posterior surface of the pancreas which extends to the back cavity of the omentum. There is also a peritoneal effusion of medium abundance at the level of the parieto-colic, Inter loops and pelvic aligners without other post-traumatic lesions. The attitude was conservative medical treatment, with clinical and radiological monitoring. The evolution was favorable.



**Figure 1 and 2:** Axial section in portal time showing a complete corporeal fracture AAST IV (Red arrow), infiltration of peripancreatic fat (green arrow), and peri-pancreatic effusion, between the splenic vein and the posterior surface of the pancreas, extended to the back cavity of epiploons (blue arrow).

## Discussion

Closed trauma to the pancreas is rare, even more so if it is an isolated trauma of the pancreas (TIP). These are severe traumas with a mortality of 5 to 30%. They constitute 3% to 12% of all trauma abdomen in children [2]. Some are unknown and are discovered only late in the complication stage.

The common mechanism is a violent epigastric trauma: In particular injuries to the handlebars of bicycle but also in case of traffic accident.

There are three types of mechanisms (but which are often associated). First crushing: The most frequent mechanism, due to the retroperitoneal localization of the pancreas in front of the spine. Pancreatic involvement most often results from a direct anteroposterior shock [1]. Second pulling: Mainly concerns the tail of the pancreas because of its mobility. It is secondary to a sudden deceleration. Third at the end of the stretch: When the spine undergoes a sudden and sudden bending movement widening the transverse diameter of the base of the thorax.

The pancreatic gland can be damaged to different degrees: First isolated parenchymal involvement, type of laceration, hematoma, or parenchymal rupture. It can be a ductal impairment alone or concomitant involvement. And then parenchymal involvement, by self-digestion of the organ, can lead to the destruction of the excretory duct.

On what concerns the diagnosis, it should be noted that neither the clinic or the biology are specific to pancreatic trauma. Patients are often asymptomatic in the immediate aftermath of trauma.

**Clinically:** The presentation can be variable ranging from stable hemodynamic state to hemorrhagic shock, or from an asymptomatic patient to a peritoneal table with hemoperitoneum or peritonitis. The major symptom is epigastric abdominal pain reminiscent of the pain of acute pancreatitis. One can have an abdominal defense by peritoneal irritation, then the patient becomes asymptomatic until the stage of complications [1].

**Biologically:** The determination of pancreatic enzymes at low sensitivity and specificity [3] with elevation to the initial phase in only half of cases [9]. Studies have shown the value between repeated measurements of amylasemia and estimating injury severity [2]. Pancreatic enzymes are performed especially when: imaging at admission is inconclusive or if the clinical course does not warrant immediate laparotomy, and in all children who have persistent and unexplained abdominal pain. A serum amylase value > 200 IU/L and a lipasemia > 1800 IU/L support major pancreatic duct involvement [1].

As far as imaging is concerned, the abdomen without preparation is not very helpful in the diagnosis of duodeno-pancreatic lesions. It can reveal either a pneumoperitoneum or a retro-pneumoperitoneum showing a duodenal perforation. Abdominal ultrasound may show a swollen appearance of the pancreatic gland, a change in focal or global echogenicity, a blurred appearance of the glandular contours, a complete or incomplete hypoechoic continuity solution, an intra- or peripancreatic hematoma, and a peritoneal effusion [11]. Abdominal CT: Remains the reference exam for the exploration of the pancreas in stable patients. Its sensitivity is better when it is performed more than 12 hours after the accident. However, a normal CT does not exclude the diagnosis of pancreatic trauma [11]. Specific signs pointing to pancreatic involvement include: enlargement of the gland, hypodense fracture or laceration, spontaneously hyperdense edema or hematoma better visualized after injection, active hemorrhage of the pancreas, fluid between the posterior surface of the pancreas and the splenic vein, which is a very specific element of pancreatic involvement, infiltration of the peripancreatic fat and or anterior renal fascias. Other less specific signs to look for are: intraperitoneal fluid effusion, heterogeneous aspect of the pancreas, abnormal enhancement of the gland, collection in the back cavity of the epiploon (a major element in pancreatic trauma) [5]. It also allows to search for associated post-traumatic lesions.

Magnetic resonance pancreatowirsungography, or MRP: Has a performance equal to ERCP in judging pancreatic duct involvement [1]. It is a non-invasive examination so less risk of complications. It makes it possible to search for the ductal rupture by showing an interruption of the ductal path with or without upstream dilatation, the focus of parenchymal fracture contains a little stasis fluid and therefore appears hypointense on the sequences weighted in T1 and hyperintense on the T2 sequences [2]. It also makes it possible to search for communication between a peripancreatic fluid collection and a ductal structure and finally to better analyze Class III injuries not visible on CT [8,11].

Endoscopic retrograde cholangiopancreatography (ERCP) is the gold standard in the detection of Wirsung lesions by highlighting PDC extravasation. However, ERCP is often the cause of complications. It should be discussed in a second step, in a stable patient, if the study of the Wirsung canal proves necessary [6,7].

The repeated realization of abdominal scan, ultrasonography or ERCP is indicated especially when there is a strong suspicion of pancreatic involvement [8].

Several severity scores were established, the most commonly used by the majority of authors is that of Lucas [1]. It is used to codify the therapeutic attitude. We distinguish:

- Modified Lucas classification of pancreatic injury:
- Class I = Simple superficial contusion or peripheral laceration with minimal parenchymal damage, any portion of the pancreas can be affected.
- Class II = Deep laceration, perforation or transection of the neck, body or tail of the pancreas, with or without pancreatic duct injury.
- Class III = Severe crush, perforation or transection of the head of the pancreas, with or without pancreatic duct injury.
- Class IV = Combined pancreaticoduodenal injuries: (a) minor pancreatic injury, (b) severe pancreatic and also duct injury.
- The American association for the surgery of trauma guidelines as follows:
- Grade I = Minor contusion without duct injury or superficial laceration;
- Grade II = Major contusion or laceration without duct injury or tissue loss;
- Grade III = Distal transection or parenchymal injury with duct injury;
- Grade IV = Proximal transection or parenchymal injury involving the ampulla; and
- Grade V = Massive disruption of the pancreatic head.

The evolution of the lesions can be done towards: superinfection and the development of pancreatic abscesses, bleeding, or even rupture, the appearance of pseudocysts, compression of the splenoportal axis and bile ducts can lead to segmental portal hypertension, or cholestasis [9]. Compression of the duodenum can cause a high bowel obstruction. Acute pancreatitis and finally vascular lesions with false aneurysms and portal thrombosis.

Despite continued efforts to create a standard protocol, the optimal management of pediatric patients with pancreatic injury remains poorly defined due to the small number of patients available for testing. Therapeutic strategy depends on the degree of pancreatic involvement and the presence or no other post-traumatic lesions [10,11]. The treatment is in the majority of cases conservative in the absence of clinical and para-clinical arguments of damage to the main pancreatic duct [12]. Externally, it can combine: endoscopic treatment by placing a stent [13], CT-guided drainage [4] and surgical treatment as a last resort: possible internal bypass procedure if pseudo-cyst (cystic bypass)-gastric or cysto-jejunal). Treatment of short-term and long-term complications.

### Conclusion

- Isolated trauma to the pancreas is very rare in children. They pose real diagnostic difficulties on the one hand and therapeutic ones on the other.
- They must be suspected as soon as possible even in the face of mild trauma (particularly in the event of an evocative mechanism: bicycle handlebars ++).
- The role of the radiologist is to establish a detailed lesion assessment, in particular the search for a possible canal rupture.
- According to the literature, a prospective study on major pancreatic trauma is underway.

### Acknowledgements

I would like to express my gratitude to my professors and all the colleagues who participated in the completion of this work. This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

### Conflict of Interest

The authors declare no conflict of interest.

## Bibliography

1. Hicham Elbouhaddouti. "Isolated pancreatic trauma: about 5 cases clinical case 4" (2010).
2. M Zerkaoui. Duodeno-pancreatic trauma in children (2014).
3. Bleichner JP, *et al.* "Pancreatitis after blunt trauma to the abdomen". *Annales Françaises d'Anesthésie et de Réanimation* 17.3 (1998): 250-253.
4. Kim HS, *et al.* "The role of endoscopic retrograde pancreatography in the treatment of traumatic lesions of the pancreatic duct". *Gastrointestinal Endoscopy* 54.1 (2001): 49-55.
5. Arvieux C., *et al.* "Pancreatic trauma". *Journal of Chiropractic Medicine* 140.5 (2003): 261-269.
6. Vegting IL, *et al.* "Is endoscopic retrograde cholangiopancreatography valuable and safe in children of all ages". *Journal of Pediatric Gastroenterology and Nutrition* 48 (2008): 66-71.
7. Rescorla FJ, *et al.* "The efficacy of early ERCP in pediatric pancreatic trauma". *Journal of Pediatric Surgery* 30 (1995): 336-340.
8. Jobst MA, *et al.* "Management of pancreatic injury in pediatric blunt abdominal trauma". *Journal of Pediatric Surgery* 34 (1999): 818-824.
9. Haugaard MV, *et al.* "Nonoperative versus operative treatment for blunt trauma to the pancreas in children". *Cochrane Database of Systematic Reviews* (2014).
10. Wood JH, *et al.* "Operative versus nonoperative management of blunt pancreatic trauma in children". *Journal of Pediatric Surgery* 45 (2010): 401-406.
11. Z Izi. "Closed pancreatic trauma". Faculty of Medicine and Pharmacy Rabat, thesis (2021).
12. Kosaku Maeda. "Management of blunt pancreatic trauma in children". *Pediatric Surgery International* (2013).
13. Telford JJ, *et al.* "Pancreatic stent placement for duct disruption". *Gastrointestinal Endoscopy* 56.1 (2002): 18-24.

**Volume 12 Issue 12 December 2023**

**©All rights reserved by Nourrelhouda Bahlouli, *et al.***