



## Isolated Celiac Artery Injury Following Blunt Abdominal Trauma

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### Abstract

Isolated celiac artery injury is a rare event, especially post blunt traumatic injury. In the event of hemodynamically instability, surgical exploration and management is the obvious approach. There is however no clear consensus on the management of hemodynamically stable patients with such injury. We present a case of an isolated celiac artery injury which was managed conservatively medically.

**Keywords:** Celiac artery injury; Blunt trauma; Visceral vascular injury; Conservative management

### Introduction

Vascular injuries represent approximately 3% of all trauma patients' injuries and involve mainly the extremities [1]. Although the true incidence of visceral vascular injury is unknown, the incidence of celiac injuries is thought to be the least out of all visceral injuries, representing approximately 1% [2].

The celiac artery or celiac trunk is the first artery that arises directly from the abdominal aorta, measuring approximately 1.5cm in length, having three main branches: i) the left gastric artery, ii) the common hepatic artery and iii) the splenic artery, supplying mainly the vital organs of the foregut. Given the vital structures its branches supply, injury to the artery results in significant mortality (as high as 75%), due mainly to hemorrhage and delayed visceral ischemia [3,4].

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**Received Date:** 04 Jun 2016

**Accepted Date:** 18 Aug 2016

**Published Date:** 21 Aug 2016

#### Citation:

Maghraby NHM, Nemeth J. Isolated  
Celiac Artery Injury Following Blunt  
Abdominal Trauma. *Ann Clin Case Rep.*  
2016; 1: 1089.

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\*Patient consent has been obtained to publish this case.

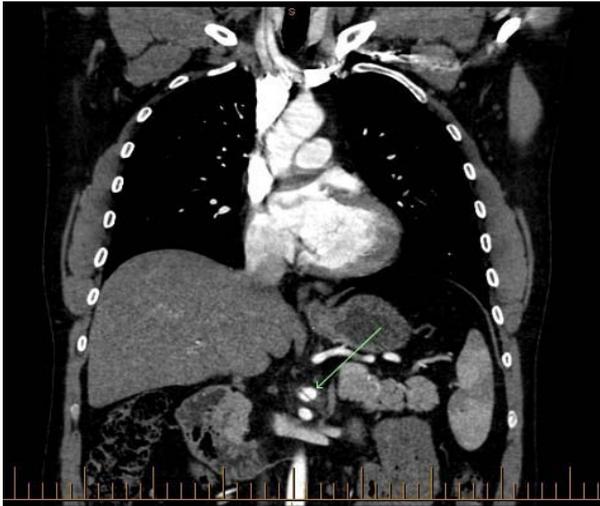
### Case Presentation

A 39 year old male was brought to our trauma center by emergency medical services (EMS), post frontal impact motor vehicle crash (MVC) at approximately 50km/hr. The patient was seat belted and the airbags deployed. On arrival the patient was asymptomatic, vital signs recorded were normal (Blood pressure 137/75 mm Hg, Pulse 86 bpm, Respiratory rate 16, O<sub>2</sub> sat 97% Room air) and the Glasgow Coma Score (GCS) was 15. In particular the abdominal exam was unremarkable and the FAST (Focused Assessment with Sonography in Trauma) was negative. The results of laboratory investigations were also within normal limits (VBG: pH 7.39, pCO<sub>2</sub> 49mm Hg, HCO<sub>3</sub> 28.7 mm/L, Base excess 4 mm/L, Lactate 1.8 mm/L, CBC: Hgb 148 g/L, Hct 0.44 L/L, Platelets 264 10<sup>9</sup>/L, Chemistry: Creatinine 97 umol/L, INR 1.14, Liver profile: T.Bili 10umol/L, ALA 30u/L, ALP 76u/L).

Following evaluation by the trauma team, the patient underwent a total head/neck/torso CT scan due to the high risk mechanism of injury. The aforementioned imaging revealed an isolated celiac artery dissection (Figure 1A and B).

The vascular surgery consultation service was asked to evaluate the patient. Since the patient was hemodynamically stable and not actively bleeding, the recommendations were to manage the patient conservatively, to repeat a CT angiogram in 48hrs and to start aspirin.

The patient was admitted to the intensive care unit for the first 24hrs, and then discharged to the ward for further observation. The patient remained asymptomatic during his hospital stay. A repeat CT angiography revealed a stable injury with all 3 branches of the celiac trunk originating from the true lumen and patent (Figure 2). The patient was discharged home with outpatient vascular follow-up. He was seen 3 weeks later at vascular clinic, no further imaging was required. Patient didn't show up for his 6 months follow up, but has been following up regularly with his cardiologist.



**Figure 1A:** Celiac Artery Dissection, injury initially identified on CT angio of the chest.



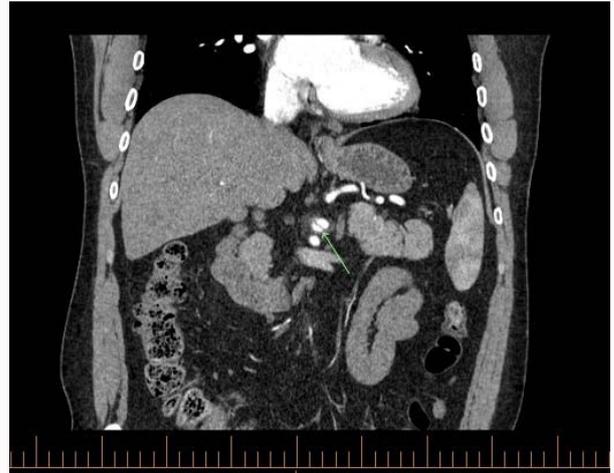
**Figure 1B:** Celiac Artery Dissection identified on CT abdomen (Trauma protocol).

## Discussion

Celiac artery injury results mainly (90-95%) from penetrating injury, blunt trauma representing only 5-10% of cases [5]. Blunt trauma results in celiac injury either directly from compression against a bony structure (seat belt injury) or indirectly from the deceleration forces especially in high speed collisions.

Diagnosis of such injuries also can present challenges if index of suspicion is not high. Many trauma CT abdomen protocols capture the images a few seconds to minutes after injection of the contrast material, to obtain the portal phase of the imaging to improve views of potential solid organ injury. This process however risks missing the proper imaging of the arterial system [6]. As with our case, the injury was incidentally identified in the lower cuts of the chest CT angiography. This potential shortcoming of many trauma CT abdomen protocols reemphasises the importance of repeating a CT angiography of the abdomen in patients with abdominal trauma with persistent abdominal symptomatology, to prevent detrimental delays leading to potential detrimental clinical outcome.

In patients with hemodynamic instability, surgical exploration and management is the obvious option. In hemodynamically stable,



**Figure 2:** Follow up image 48hrs post injury with stable Celiac Artery Dissection.

asymptomatic patients however, the treatment options are unclear. Most of the reported cases included symptomatic patients and were managed either surgically or with endovascular methods [7].

## Conclusion

Celiac artery injury is a rare with a high mortality rate if the diagnosis is delayed. In hemodynamically unstable patients, surgical treatment is required. In hemodynamically stable, asymptomatic patients, the treatment options (surgical vs. endovascular repair vs. conservative medical), the timing of reimaging and duration of observation and are not as well defined.

A high clinical suspicion and low threshold for repetition of CT imaging should be maintained for all trauma patients with persistent/new abdominal symptoms. The differential diagnosis should include arterial injury.

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