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Isolated gallbladder injury from blunt abdominal trauma: A rare co-incidence

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OPINION

Isolated gallbladder injury from blunt abdominal trauma: A rare co-incidence

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Abstract

Gallbladder injury resulting from blunt abdominal trauma is a rare entity and generally associated with other intra-abdominal injuries. Incidence of isolated gallbladder injury has not been reported yet. The most common mechanism of injury reported is road traffic accident. Diagnosis is usually made on imaging as clinical presentation may vary from no symptoms to peritonitis due to extravasation of bile in the abdominal cavity. Cholecystectomy is the treatment of choice and minimally invasive approach can be considered in haemodynamically stable patients.

Keywords: Gallbladder injury, Blunt Trauma, Cholecystectomy.

Introduction

Gallbladder injury resulting from blunt abdominal trauma is a rare entity and is usually associated with other visceral injuries. The low incidence is attributed to the protection provided by surrounding liver and rib cage. The reported incidence is 2% in patients undergoing laparotomy for blunt trauma.[1] Isolated gallbladder injury is even rarer and the incidence has not been reported yet. Soderstorm et al[2] reported 5 out of 30 cases of isolated gallbladder injuries. This was also described by Wiener et al[3] reporting only half of the cases of gallbladder were in isolation.

Mechanism of Injury

Most blunt injuries results from motor vehicle accidents, falls or direct blow to the abdomen. Predisposing factors include thin wall and distended gallbladder and alcohol ingestion which increases the sphincter of Oddi tone thus increasing biliary pressure.[4] Gallbladder injuries include lacerations, avulsions and contusions resulting from compressive and shearing forces. Laceration, also known as rupture is the most commonly reported injury. Avulsion is the second most common injury and has three subtypes: partial avulsion in which the gallbladder is partially torn from liver bed; complete avulsion in which the gallbladder is completely detached from liver bed but cystic duct and artery are intact and total avulsion in which the gallbladder is completely torn from its attachments and lies free in the abdomen. Contusion or intramural haematoma is often diagnosed at the time of laparotomy and is underreported, that can lead to delayed perforation due to wall necrosis.[5] Losonaff and Kjossev described a detail classification of gallbladder injuries (Table-1).[6]

Table-1: Types of gallbladder injury according to Losanoff and Kjossev.

Type	Injury of gallbladder
1A	Contusion with intramural hematoma
1B	Contusion with hematoma
2	Rupture
3A	Avulsion with partial detachment
3B	Avulsion with complete detachment of liver but with attachment to the structures of hepatoduodenal ligament(so called near total cholecystectomy)
3C	Torn only from the hepatoduodenal ligament
3D	Completely torn from all attachments(traumatic cholecystectomy)
4A	Traumatic cholecystitis, secondary to haemobilia
4B	Acute acalculus cholecystitis
5	Mucosal tear with leakage of bile

Presentation

Clinical presentation of isolated gallbladder injury as a result of blunt abdominal trauma varies from subtle right upper quadrant pain to peritonitis in case of extravasation of bile from a perforated gallbladder. In case of subtle symptoms and low index of suspicion, patients might get discharged from hospital on symptomatic management.[7] Consequently, such patients may present late with pain, fever, nausea, vomiting or jaundice secondary to intraabdominal collection of bile and /or with superadded infection or frank peritonitis.[2] The clinical presentation is almost attributable to associated intraperitoneal injuries including solid, hollow viscous or vascular injuries on initial presentation.

Diagnosis

Early diagnosis of gallbladder injury resulting from blunt abdominal trauma is crucial but is difficult to determine. No single radiographic evaluation has proven to have adequate sensitivity or specificity for diagnosing

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Table-2: Cases of isolated gallbladder injuries resulting from Blunt abdominal trauma from January 1980 to April 2019.

	Year	Title	Mechanism/Presentation	Management
1	1980	Gallbladder Injuries Resulting from Blunt Abdominal Trauma[13]	Blunt Abdominal trauma Abdominal pain	Cholecystectomy in majority of cases.
2	1995	Traumatic Injuries Of the Gallbladder: Report On 32 Cases[14]	Review of cases Abdominal pain	Open Cholecystectomy
3	2001	Gallbladder Avulsion Due To Blunt Trauma[15]	Road traffic accident Abdominal pain	Open Cholecystectomy
4	2011	Isolated complete avulsion of the gallbladder (near traumatic cholecystectomy): a case report and review of the literature[16]	Road traffic accident Abdominal pain	Open Cholecystectomy
5	2002	Sonographic Diagnosis of Traumatic Gallbladder Rupture[17]	Road traffic accident Abdominal pain	Open Cholecystectomy
6	2004	Blunt Traumatic Injury of the Gallbladder[18]	Altercation and direct blow to upper abdomen Abdominal pain	Open Cholecystectomy
7	2004	Isolated Gallbladder Injury after Blunt Abdominal Trauma[19]	Road traffic accident Abdominal pain	Open Cholecystectomy
8	2005	CT Diagnosis of Traumatic Gallbladder Injury[20]	Road traffic accident Abdominal pain	Open Cholecystectomy
9	2005	Gall Bladder Injuries As Part Of The Spectrum Of Civilian Abdominal Trauma In South Africa[21]	Review of cases Abdominal pain	Open Cholecystectomy
10	2006	Laparoscopic Cholecystectomy for Isolated Traumatic Rupture of the Gallbladder Following Blunt Abdominal Injury[22]	Fall into a bathtub Abdominal pain	Laparoscopic Cholecystectomy
11	2007	Delayed presentation of an isolated gallbladder rupture following bunt abdominal trauma: a case report[23]	Knocked down by a horse Abdominal pain	Open Cholecystectomy
12	2007	Isolated Gallbladder Injury after Blunt Abdominal Trauma. A Case Report and Review[24]	Road traffic accident Abdominal pain	Open Cholecystectomy
13	2007	Traumatic rupture of the gallbladder after blunt abdominal trauma[25]	Fall on the floor Abdominal pain	Open Cholecystectomy
14	2010	Isolated traumatic gallbladder avulsion: a case report[26]	Road traffic accident Abdominal pain	Laparotomy and Cholecystectomy
15	2010	A decade of experience with injuries to the gallbladder[27]	Review of cases Abdominal pain	Cholecystectomy
16	2012	Isolated Gallbladder Injury in a Case of Blunt Abdominal Trauma[28]	Road traffic accident Abdominal pain	Open Cholecystectomy
17	2012	Laparoscopic cholecystectomy for traumatic gallbladder perforation[29]	Road traffic accident Abdominal pain	Laparoscopic Cholecystectomy
18	2013	Isolated gallbladder perforation following blunt abdominal trauma: A missed diagnosis[30]	Road traffic accident	Laparotomy and Cholecystectomy
19	2013	Laparoscopic Cholecystectomy after Isolated Blunt Gallbladder Trauma Resulting in Intraluminal Hemorrhage: Computed Tomography and Operative Findings[31]	Fall from 15 feet Abdominal pain	Laparoscopic Cholecystectomy
20	2013	Isolated gallbladder rupture following blunt abdominal trauma[32]	Road traffic accident Abdominal pain	Open Cholecystectomy
21	2013	Non-operative Management of Gallbladder Perforation After Blunt Abdominal Trauma[33]	Road traffic accident Abdominal pain	ERCP* and intraperitonealdrain placement
22	2014	Isolated gallbladder perforation following blunt abdominal trauma[34]	Direct blow to the abdomen with butt of a gun Abdominal pain	Laparotomy and Cholecystectomy
23	2015	Ruptured Gall Bladder containing Stones following Blunt Trauma Abdomen: A Rare Presentation of Hemodynamic Instability[1]	Road traffic accident Abdominal pain	Open Cholecystectomy
24	2015	Isolated Gall Bladder Laceration in Left Sided Blunt Trauma Chest[35]	Road traffic accident Abdominal pain	Open Cholecystectomy
25	2016	Traumatic gallbladder rupture: a patient with multiple risk factors[36]	Road traffic accident Abdominal pain	Open Cholecystectomy
26	2016	Traumatic Gallbladder Rupture Treated by Laparoscopic Cholecystectomy[37]	Road traffic accident Abdominal pain	Laparoscopic Cholecystectomy
27	2016	Isolated gallbladder rupture following blunt abdominal injury[38]	Blow from a fist Abdominal pain	Laparotomy and Cholecystectomy
28	2019	Isolated Rupture of the Gallbladder Secondary to Blunt Abdominal Trauma[39]	Fall onto a floor fan Abdominal pain	Laparoscopic Cholecystectomy

*Endoscopic retrograde cholangio-pancreatograms.

gallbladder injury from blunt abdominal trauma.[8] Diagnostic modalities for identification of gallbladder trauma include ultrasonography, computerized tomography and HIDA scan. Ultrasound findings include thickened hypoechoic oedematous gallbladder wall, an echogenic pericholecystic fluid collection, heterogeneous hyperechoic blood within the gallbladder lumen, disruption of the gallbladder wall and collapse despite prolonged fasting. However, ultrasound is more useful for the evaluation of atraumatic gallbladder pathology.[9]

The most effective imaging modality in identifying gallbladder injury is contrast enhanced CT scan. Presence of hyperdense blood within gallbladder lumen is suggestive of gallbladder trauma.[9] Other CT findings include pericholecystic fluid, thickened and indistinct gallbladder walls, a mass effect on the adjacent organs including liver, duodenum and right kidney due to gallbladder distention, displacement of gallbladder from its fossa due to complete avulsion and active arterial contrast extravasation into gallbladder lumen.[10] Delayed phase images are vital in differentiating true gallbladder haemorrhage from other non-traumatic pathologies because of an increase in the amount of dense fluid or extravasation as the haemorrhage progresses.[4]

Hepatobiliary scintigraphy can be used in equivocal cases which can detect the extravasation of radioisotope due to bile leakage from gallbladder.[11] Magnetic resonance imaging can detect areas of mural discontinuity due to superior soft tissue resolution, however, its use is limited in trauma settings due to long examination times.[12]

Management

Gallbladder injury can be potentially life-threatening, and early management is imperative. Cholecystectomy is the treatment of choice for traumatic gallbladder injuries. However, treatment approach depends on the type of injury, extent of associated injuries and general condition of the patient. In patients undergoing laparotomy for associated injuries, cholecystectomy is the treatment of choice. However, minimally invasive approach in the form of laparoscopic cholecystectomy is a safe option in stable patients without major associated injuries. Patients with mild injuries like isolated partial avulsion or contusion of gallbladder with polytrauma without associated abdominal injury can be observed with conservative management, although late necrosis and perforation have been reported.[5]

Literature Review

Literature search was done using PubMed and Google Scholar to find studies mentioning isolated gallbladder rupture resulting from blunt abdominal trauma from January 1980 till April 2019. Search term used were 'isolated gallbladder injury' and 'blunt abdominal trauma'. Total of 28 full text studies were selected to review the presentation, mechanism of injury and management of patients with isolated gallbladder injuries (Table-2).

Available literature suggests that, although a rare entity, isolated gallbladder injury has been reported in literature; however, the true incidence has not been calculated as yet. The most common mechanism in the reported cases was road traffic accident. Except for the one case of delayed presentation,[28] all patients presented early to hospital after injury and the most common symptomatology was right upper quadrant pain. Radiological imaging was used to diagnose the injury in all cases however; the exact type of injury according to Losanoff and Kjossev[6] was not mentioned in every case. Cholecystectomy was the standard of care in nearly all cases except for one case who was an elderly high risk patient with multiple comorbid conditions and was managed with intraperitoneal drain placement and ERCP. Minimally invasive approach in the form of laparoscopic cholecystectomy was performed in haemodynamically stable patients.

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