

DELAYED SURGERY IN A COMPLEX TRAUMA PATIENT WITH AORTIC RUPTURE, BLUNT HEAD TRAUMA AND LIVER LACERATION: A CASE REPORT

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Aortic rupture is a critical condition in trauma patients. Most patients are killed at the scene of the accident. A patient who survives long enough to reach hospital also has a high risk of rupture during management. We report a patient who was transferred from a municipal hospital with the emergency complex of blunt head trauma and chest and abdominal contusion. Chest computed tomography scan revealed aortic rupture. Liver laceration with hemodynamic stability and brain concussion were also diagnosed in the emergency room. She was admitted to the trauma intensive care unit without emergency surgery. She received aorta repair after 5 days of observation. After the operation, the patient recovered very well. Delayed surgery for aortic rupture as a treatment choice may be of benefit in selected complex trauma cases.

Key Words: aortic rupture, head injury, internal bleeding, trauma
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Traumatic aortic rupture is rare in trauma patients; a high-volume trauma center may handle only two to three cases a year [1,2]. This kind of patient sometimes has multiple organ injuries, and the best way to proceed with medical intervention is not always clear. Currently, there is no single form of approach for diagnosis and management. We report the case of a woman who was in a motorcycle crash that caused complex trauma with aortic rupture, liver laceration and brain concussion. She received surgical repair after a 5-day medical treatment period in the trauma intensive care unit (ICU).

CASE PRESENTATION

A 27-year-old woman who was in a serious motorcycle accident was transferred from a municipal hospital with the diagnosis of aortic dissection to our emergency room (ER). In the ER, she was also found to have blunt head injury and abdominal contusion. Clinical evaluation revealed Glasgow Coma Scale 13 without hemodynamic impairment and severe multiple blunt traumas to the head, thorax and abdomen. Brain and chest computed tomography (CT) scans were performed, with the findings of aortic rupture (Figure 1) and liver laceration (grade 4) combined with intra-abdominal bleeding (Figure 2). Emergency surgery for the aortic rupture and liver laceration was not performed because hemodynamic stability was easily obtained after first aid. She was admitted to trauma ICU for blood pressure control and observation of aortic rupture and intra-abdominal bleeding. Her blood



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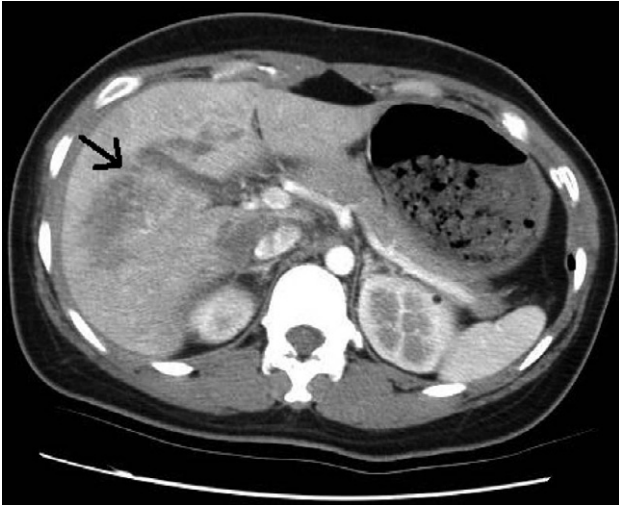


Figure 1. Abdominal computed tomography shows liver laceration (grade 4) with internal bleeding (arrow).

pressure was under strict control (systolic blood pressure, <120 mmHg) and her pulse rate was <100/min. After 5 days of conservative treatment and close observation, when the possibility of the progression of liver laceration bleeding and brain trauma no longer existed, she received a full heparinization bypass operation for surgical repair of the aortic rupture. She had an uneventful postoperative course.

DISCUSSION

Traumatic aortic rupture is an uncommon injury in clinical practice that is associated with high morbidity and mortality. Dealing with patients who have multiple traumas is a significant challenge for the emergency physician and trauma surgeon. Parmley et al reviewed thoracic aortic injuries and their analysis demonstrated an out-of-hospital mortality rate of 86.2% [3]. Due to lack of experience in the management of traumatic aortic dissection and its potentially lethal rupture, there is still no uniform answer as to when is the best time to operate on such patients. Multiple organ injuries are frequent in both survivors and non-survivors of traumatic aortic injury. Non-survivors on average have four associated injuries in contrast to the two sustained by survivors [4]. Our patient had a combination of three injuries with a high immediate surgical risk.

We elected to delay surgery in our patient after verifying that there were no further lethal complications of liver laceration with bleeding, blunt head



Figure 2. Chest computed tomography with reconstruction shows aortic rupture (arrow).

trauma with unconsciousness, and rupture of aortic dissection.

With the recent shift in management strategy of blunt liver and spleen injuries to nonoperative management [5,6], it appears to be controversial as to whether this kind of patient should receive emergency thoracotomy. Nzewi et al reported that a delayed management approach with aggressive blood pressure control and serial radiologic monitoring is a safe and recommended option for those with severe concomitant injuries or with other medical comorbidities that render surgery high risk [7]. Although delaying aortic repair has been safe in most cases, this was shown to lead to longer hospitalization and increased costs [8]. Santaniello et al reported 20 patients with blunt aortic injury with grade I or II liver or spleen injury who underwent planned nonoperative management with a mean time to operation for aortic repair of 1.52 days [9]. The safety of heparinizing patients with higher grades of liver or spleen injuries (III–V) was not studied, however, and no conclusions can be drawn.

The optimal time for operation cannot be established due to the varying conditions of each patient. Angiography for liver laceration was also not performed in this patient due to the fear that the pressure would worsen the aortic rupture, though there is no information on how much pressure would cause rupture when angiography is performed. Accordingly, in

such patients, it is safer to confirm that the other critical injuries have been treated, rather than to take care of the aortic dissection immediately when the patient's condition is not stable. Symbas et al also reported that delayed repair of acute traumatic aortic rupture more than 48 hours after injury was safe under appropriate treatment (arterial pressure maintained at <70 mmHg) and should be considered [10]. We waited for 5 days and closely monitored our patient's condition in the ICU. Aortic rupture was repaired with full heparinization bypass operation. Although traumatic rupture of the aorta is an uncommon injury that requires aggressive diagnosis and treatment, it is wise to use partial bypass with full heparinization to repair an aortic injury with low-grade acute liver or spleen injuries. Nevertheless, based on our experience with this case, it may be safer to delay the operation for patients with complex trauma until their condition has stabilized, even if the delay is as long as 5 days.

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延遲性手術在複雜性外傷主動脈破裂合併 頭部外傷及肝臟撕裂傷之治療 — 病歷報告

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主動脈破裂是在創傷的病患裡的一種致命的危機。大多數病患已經在發生地點已經死亡。對那些到醫院還存活的病患在治療期間也有相當高破裂的危險。我們提出一個從區域醫院轉診的病人合併有頭部，胸和腹部受傷的病歷報告。主動脈破裂在做完胸部電腦斷層後被確認。由於肝臟破裂和頭部外傷，在有主動脈破裂的危險下她被送進入我們的加護病房。五天之後，她接受主動脈破裂修補然後在沒有其他併發症下出院。所以延後多重外傷合併主動脈破裂的開刀時間，在某些的病人身上是有助益的。

關鍵詞：主動脈破裂，頭部外傷，內出血，創傷

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