

Transplant Nephrectomy after Blunt Abdominal Trauma from Crush Injury

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1. Case Report

A 44-year-old male sustained blunt abdominal trauma when he was pinned between two motor vehicles. He was transported to a level 1 trauma center with abdominal pain and hypotension. On admission his blood pressure was 60/34 with a pulse of 89. Respirations were 24 and his temp was 97 degrees. The patient gave a history of a left sided renal transplant and a pancreas transplant 4 years previously because of Type I diabetes. His immunosuppression regimen consisted of Tacrolimus and Mycophenolate Mofetil. His GCS was 15 and his blood pressure improved to a systolic of 100 with 2 units of packed red blood cells. His abdomen was non-distended and soft. His FAST was positive, but he was taken to CT for further evaluation. The initial lactate was 2.4. Serum creatinine was 2.3 with a BUN of 42. The INR was 1.15 and the prothrombin time was 13.2. The hemoglobin was 11 with hematocrit of 36.9 and WBC 10,400. CT revealed significant hemoperitoneum (Figure 1). The spleen and liver appeared intact. Injury to the transplanted kidney was evident with bleeding noted on the contrast CT (initial and delayed films Figure 2-4). The patient was taken to the operating room for definitive care. Abdominal exploration revealed on-going bleeding from the transplanted kidney. QuickClot and laparotomy pads were used to tamponade the active bleeding. Ligation of a renal vein that was bleeding was done. An initial attempt was made at partial nephrectomy with the thought that preservation of the lower portion of the kidney might be achievable. Continued bleeding from the raw surface of the kidney and hilum occurred. Completion nephrectomy was then performed. The small bowel was evaluated, and no enteric injury was found. The colon was intact although there was a large mesocolic defect at the level of the sigmoid colon. Doppler evaluation of the proximal and distal colon revealed intact perfusion. The mesocolic rent was repaired with silk suture. The pancreas allograft was intact. A left pelvic drain was placed, and the patient was transferred

to the intensive care unit for continued resuscitation. He received 15 units of packed red blood cells, 9 units of fresh frozen plasma, 1 pack of cryoprecipitate and a 10 pack of platelets during the operative procedure. The aggregate weight of the specimen was 244 grams. Pathology revealed chronic patchy interstitial inflammation and fibrosis with dystrophic calcifications in the renal tubules.

His post-operative course was benign. As expected, the BUN and creatinine increased peaking at BUN of 62 and creatinine of 8.6 prior to the initiation of dialysis. His post-operative medications included tacrolimus and mycophenolate mofetil because of the pancreas transplant. The serum glucose ranged between 88 and 134 in the post-operative period. The patient was discharged to home in good condition after 7 in-patient days.



Figure 1:

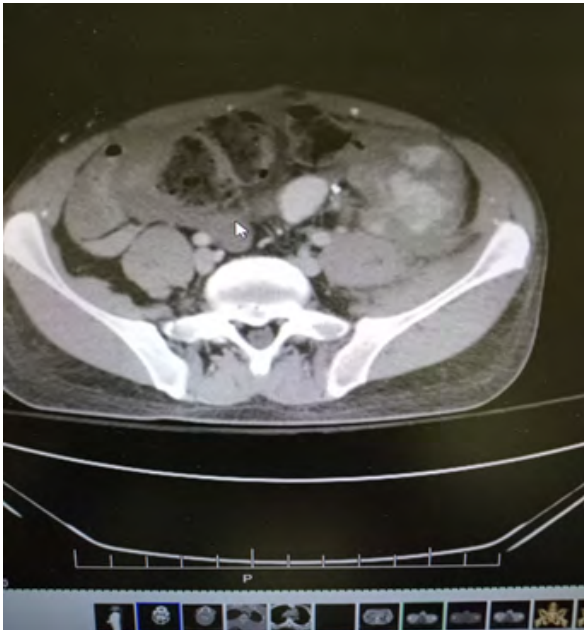


Figure 2:



Figure 3:

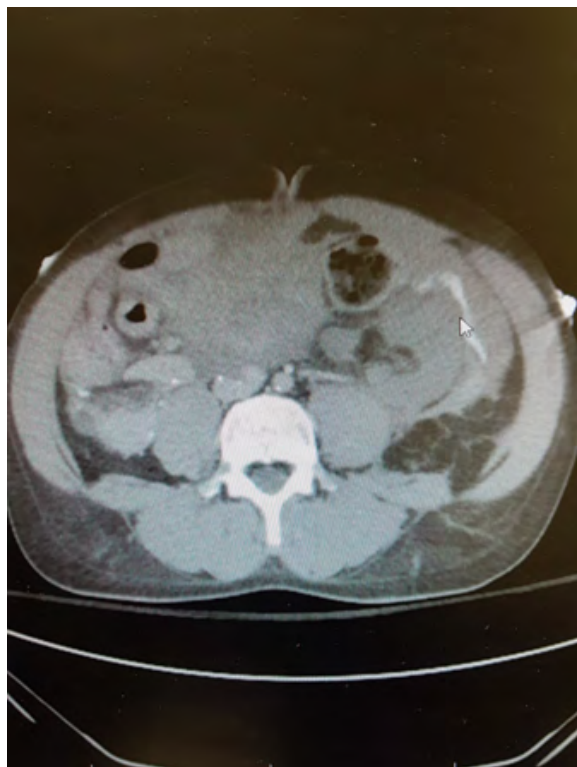


Figure 4:

2. Discussion

Blunt abdominal trauma with associated hypotension often heralds bleeding from a solid organ, such as the liver or spleen [1]. Patients with a positive FAST (focused abdominal ultrasound for trauma) and hypotension should be considered for immediate exploration with arrangements made for implementation of a massive transfusion protocol (MTP) [2]. In this instance a systolic blood pressure of less than 90 in combination with a positive FAST was enough to prompt activation of MTP. This patient responded quickly to 2

units of packed cells, and he remained alert and oriented. Given his history of a left renal transplant, CT evaluation was chosen to gather more information regarding the bleeding source. The anatomic location of the allograft to the left iliac area places this organ at risk in the setting of a crush injury [3]. The CT revealed a large hemoperitoneum with a normal liver and spleen. Bleeding from the transplanted kidney was evident both on the initial contrast images and the delayed images. Detection of on-going hemorrhage using CT is reliable [5]. Operative intervention was clearly indicated. There

are well defined risk factors associated with the need for nephrectomy. On going hemorrhage and high-grade injuries are two major factors favoring nephrectomy [6]. A large 15-year retrospective analysis of the Japan Trauma Data Bank confirmed hypotension as a major risk factor for nephrectomy [7]. Partial nephrectomy has been described on a delayed basis for a Grade IV blunt renal injury [8]. In the acute trauma setting usually severe Grade 4 or 5 injuries are not amenable to preservation of a portion of renal mass [9]. Practice management guidelines have been generated for trauma to native kidneys (in their usual retroperitoneal position). These guidelines state that: "In hemodynamically unstable patients with an expanding Zone 2 hematoma that requires exploration, partial nephrectomy or renorrhaphy has been conditionally recommended" [10]. Peri-transplant hematomas may produce a Page kidney with hypertension and decreased renal function. Evacuation of the hematoma may reverse these findings [11]. Transplant nephrectomy provides definitive bleeding control and may allow additional injuries in the vicinity to be treated [12]. In our patient given the hilum involvement preservation of a portion of the transplanted kidney was not possible.

Non-operative care that is multi-disciplinary in scope must be strongly considered for lesser grade injuries [13]. Non-operative care may be successful for more severe injuries if these patients are carefully selected and remain hemodynamically stable [14]. If the allograft cannot be salvaged, scheduled dialysis is usually resumed in the early post-trauma period. In our patient immunosuppression was continued because of the presence of a functioning pancreas transplant.

In summary we describe the care of a middle aged male renal allograft and pancreas allograft recipient who sustained blunt abdominal trauma from a crush injury. On-going hemorrhage from the transplanted kidney resulted in transplant nephrectomy. Post-operative functioning of the pancreas transplant was evident. He was discharged to home in good condition.

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