Case Report

Massive haemorrhage and rupture of renal transplant from a donor who died of snake bite

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Introduction

A patient with chronic renal failure on haemodialysis was on the high urgency list for renal transplantation because of the multiple failures of vascular access. He had a renal transplant from a donor who died following a snake bite. The course was complicated by massive haemorrhage and rupture of the graft. We conclude that organ donation from a donor who died of snake bite should be considered as absolute contraindication for transplantation.

Case history

The donor is a 31-year-old male Egyptian who went on a picnic in the desert and was admitted with a history of collapse following a snake bite (type unknown) [1–2] to a local hospital in Riyadh, he was given antivenom [9] on arrival to the Emergency Room. There was swelling at the site of the bite. His condition rapidly deteriorated requiring ventilation. His clinical picture was compatible with cerebrovascular accident. CT scan of his head showed massive intracerebral haemorrhage [3]. He had mild DIC, his platelets dropped from normal to 114 K/μl. He had mild deranged clotting, haemoglobin dropped but remained stable at around 9 g/dl. Within 24 h of admission he was clinically brain dead which was confirmed according to the recognized criteria. He had reactive hyperglycaemia. His urine output and serum creatinine were normal throughout the hospital admission (97.8 ± 6.8 μmol/l). His liver enzymes were normal except an elevation of bilirubin (39 μmol/l). He was afebrile, maintained normal blood pressure without inotropes, except that he was on dopamine 3 μg/kg/min to maintain his renal perfusion. He was started on ceftriaxone empirically. Serological tests for hepatitis B, C, HIV, CMV, VDRL were all negative, as well as blood and urine cultures. The other donor kidney was not suitable for transplantation because of a congenital anomaly.

The recipient was a 40-year-old Saudi patient who had been on haemodialysis for over 7 years. He had extensive problems with vascular access on dialysis. He was placed on the national priority list for renal transplantation (RTx) once the cadaveric kidney had become available, he was transplanted 18 h after retrieval. He had a negative lymphocytic cross match and one A, B, DR, HLA match. Postoperatively he was put on broad spectrum antibiotics and triple immunosuppressive therapy. The graft had primary non-function. He was started on dopamine infusion 5 μg/kg/min. Eight hours later he developed hypotension with BP 95/50. He was cold, clammy with profuse sweating and was afebrile. He had no reflex tachycardia and clearly had signs of active bleeding with increasing pain, tenderness and swelling around the transplant kidney. It is worth mentioning that at this stage, his preoperative, and up to 6 days post-RTx he had a normal PT, APTT, negative FDP and his platelets were 440 K/μl. His haemoglobin had decreased from 9.9 to 7.6 g/dl. Ultrasound scan (U/S) showed haematoma around the graft. He was given four units of fresh frozen plasma (FFP) and two units of packed cells and was taken to theatre for exploration of his transplanted kidney, removal of the haematoma (600 ml), haemostasis. There was no bleeding from either the renal artery or vein. There was generalized oozing from the raw muscle surface which could not be controlled. Two large drains were inserted.

Postoperatively he continued oozing from the wound and through the drain, and was given a further four units of FFP and blood. He continued slowly but actively bleeding requiring daily at least two units of blood and FFP. On the sixth day there were more signs of acute bleeding and a large haematoma accumulated around the RTx as shown by U/S and clinically. He was taken to theatre and approximately 1200 ml blood and blood clots were removed. There was no bleeding site found. We continued with active supportive treatment including FFP, blood transfusion, inotropes and broad spectrum antibiotics, and was dialysed without anticoagulants.
On the twentieth day it was, however, discovered that he was leaking urine into the perinephric space. This was documented by U/S and aspiration of the collection. Consequently he was explored and it was found that his ureter was necrotic and had a urinary leak. Mobilization of his native ureter was done and anastomosis to the RTx and bladder and J stent were inserted. During the operation there was constant oozing from all surfaces as had been noticed at previous operation. Estimated bleeding was 1500 ml. He was given blood, platelets and FFP. Subsequent to this procedure he continued to bleed, his clotting became abnormal at this stage from day 17 to day 30 where he had abnormal clotting and bleeding time, FDP was >10 and <40 µg/ml. Again it is important to stress that initially his clotting profile was normal and his clot retraction was normal, this implies normal platelet function. He had normal liver enzymes, no evidence of chronic liver disease and no evidence of cyclosporin toxicity or CMV infection. However, during the last week of his illness his urine, abdominal drain and Permcath catheter grew heavy growths of *Candida albicans*. He was started on fluconazole. His sputum grew Gram-negative Diplococci. A swab from the groin showed a growth of *Staphilococcus aureus* (penicillin-resistant *S. aureus*). Series of blood cultures were negative. Not surprisingly in the interim the kidney had not shown much function.

On thirtieth postoperative day dissection of the wound developed and he bled profusely. He was again taken to theatre. The graft was found to have ruptured with several tears measuring between 5 and 8 cm in length noted. A large amount of blood and clots were evacuated approximately 5000 ml, and transplant nephrectomy was done. Microscopically there were multiple Candida abscesses (Figure 1), renal tubular necrosis and renal capsule rupture. There was no glomerular or vascular changes. Postoperatively he was severely hypotensive, continued to bleed despite multiple maximum supportive treatment and his blood pressure became unrecordable and he subsequently died.

**Fig. 1.** Branching candidal fungal hyphae within a necrotic focus.

### Discussion

With great sadness we report this human tragedy. This RTx recipient had had a very hard time on dialysis for over 7 years with multiple vascular access failures, entailing multiple operations before his RTx. He was dialysed via a Gore-Tex graft in his groin which had become infected and clotted, requiring removal. When the very anxiously awaited cadaveric kidney became available we expressed concern and apprehension about its safety, but we were reassured that the snake venom was neutralized within a few hours following antivenom [4,5,7,8] and that retrieval was done 5 days after the incident and the donor had normal renal function. However, according to report in the literature the kidney concentrates circulating venom fractions. Acute renal failure usually becomes clinically evident towards the end of the first week after the bite [6,10,11]. As with shock, the pathogenesis is probably multifactorial and includes ischaemia, haemoglobinuria, myoglobinuria and direct nephrotoxic venom effects. Most of the snake bites encountered in Saudia Arabia are due to carpet vipers, known as *Echis carinatus* [1]. The venom of vipers is cytolytic which is responsible for the swelling and necrosis of tissue at the fang punctures, and haemolytic causing disseminated intravascular coagulation (DIC), the common terminal event with intracranial haemorrhage or massive intra-abdominal bleeding. Most venom effects reach their peak before the fourth day. There is no doubt that there was direct circumstantial evidence that the recipient’s spontaneous and fatal oozing which coincided with the renal transplant is almost certainly related to the effect of traces of venom stored in the donor kidney, in the absence of surgical bleeding, abnormal clotting, low platelet count or platelet dysfunction.

It is of considerable interest to know that spontaneous oozing is caused mainly by direct endothelial damage by a venom component (haemorrhagin) which does not affect coagulation. The coagulation defect defibrinogenation caused by certain viper venoms is not the primary cause of bleeding. This is shown by the following observations: abnormal bleeding occurs with viper venom that do not affect coagulation, with coagulant venoms bleeding can precede change in coagulation. Complete defibrinogenation can persist for days without spontaneous bleeding [7,13,14].

It was a very hard lesson that despite this donor having normal renal functions, use of his kidney for transplantation posed potential risk to the recipient. Unfortunately we did not have facilities for ELISA test [15,16] to detect venom antigen in the sera of the recipient, as in fact it has been shown that high venom concentrations were still found in blisters aspirated at the site of the bite and clinical research in *Achis carinatus* victims has confirmed that antivenom can temporarily stop abnormal bleeding and restore clotting to normal [5,8].

We conclude that organ donations from donors who died from snake bites should be an absolute contraindication for transplantation.
References

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Received for publication: 24.11.97
Accepted: 28.11.97