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Management of a Stage IV Kidney Fracture Discovered Late in a Developing Country (Cameroon)

Frantz Guy Ngalle Epoupa[1*], Philip Hernandez Owon'Abessolo[2], Armel Quentin Essomba[2], Maurice Esong Fonji[1], Fru Angwafo III[2]

[1]Department of Surgery and Specialities, Faculty of Medicine and Biomedical Sciences, University of Yaoundé I, Yaoundé, Cameroon
[2]Department of Surgery and Specialities, Faculty of Medicine and Pharmaceutical Sciences, University of Douala, Douala, Cameroon
Email: *frantzepoupa@gmail.com

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Abstract

Introduction: Severe kidney injury is becoming increasingly common in our setting, particularly secondary to penetrating and blunt injuries. This injury often goes unnoticed on initial presentation. The decision to perform a nephrectomy in cases of kidney trauma depends on the extent of the injury, associated complications and the patient's general state. **Case presentation:** We report the case of a 25-year-old patient who presented at the emergency department of the Douala General Hospital (DGH) in a state of haemorrhagic shock following a penetrating dorsolumbar injury which had occurred one week earlier. The discovery of an AAST grade 4 renal lesion led to an emergency nephrectomy. **Conclusion:** Kidney injury can occur through several possible mechanisms. Nephrectomy rate increases as renal trauma becomes more severe, particularly in the case of penetrating injuries. Our focus is on the delay in nephrectomy after severe renal trauma in our setting.

Keywords

Severe Kidney Trauma, Nephrectomy, Douala, Cameroon

1. Introduction

Nephrectomy, the surgical removal of a kidney, is an important consideration in cases of renal trauma [1]-[4]. Renal trauma can have various causes, including penetrating or blunt injuries, which vary in severity [5]. In cases of severe renal trauma, such as those involving vascular injury or extensive lacerations, a nephrectomy may be necessary to control bleeding and ensure patient stability.

Therefore, the decision to perform a nephrectomy in cases of renal trauma depends on the extent of the injury, associated complications, and the patient's overall clinical state. We report a case of an emergency nephrectomy for an AAST grade 4 renal trauma following a stab wound that occurred one week prior to the patient's presentation.

2. Clinical Case

The patient was a 25-year-old student residing in Douala. He had sustained a traumatic stab wound to the lumbar region 7 days prior for which he consulted at a primary health facility. There the wound was sutured and he was prescribed analgesic and antibiotic medications. A urine dipstick was not done. He was then discharged home. Upon returning home, he developed visible haematuria, for which nothing was done. The onset of fever and severe asthenia associated with this haematuria prompted a visit to the emergency department of the DGH. Clinical examination on arrival revealed a severely asthenic state, anorexia and a fever of 38.7˚C. He was hypotensive with a BP of 80/48 mmHg, a pulse rate of 126 beats per minute, a respiratory rate of 23 cycles per minute, and oxygen saturation of 85% in ambient air. He had a sutured 4 cm linear penetrating wound on his right dorsolumbar region, from which serosanguineous fluid could be expressed. The abdomen was full and moved with respiration. There were equally signs of diffuse peritoneal irritation on palpation. Prehepatic dullness was maintained. The rest of the physical examination was unremarkable. After initial resuscitation, an abdomino-pelvic CT scan revealed a parenchymal tear, extending from the left lower renal pole to the hilum with an associated breach of the excretory tract, corresponding with an AAST grade 4 lesion. In the phase of these radiographic findings and a persistence in hypotension, an emergency laparotomy nephrectomy was indicated. Laboratory tests were performed. The blood count revealed moderate normocytic and normochromic anaemia (haemoglobin level = 8.8 g/dl, MCV = 89 fl, MCH = 28.4) and neutrophilic hyperleukocytosis (white blood cells = 16,300/mm^3, neutrophils = 72%). C-reactive protein (CRP) was elevated (22 mg/l). The other tests were within normal limits. These included renal function, blood ionogram and coagulation profile (urea = 0.3 g/l, creatinine = 0.883 mg/dl, Na+: 133 mmol/l, K+: 3.47 mmol/l, Cl–: 102 mmol/l, PT = 77% and APTT = 25.5 seconds). The blood group was B Rh positive. The laparotomy consisted of a midline xyphopubic incision, revealing approximately 500 ml of haemoperitoneum and a large left retroperitoneal haematoma compressing the descending colon. A breach in peritoneum was equally objectified, without bowel perforation. The procedure consisted of along the left lateroconal ligament to detatch the descending colon and mobilising it medially, effectively getting access to the retroperitoneal space. The retroperitoneal blood met was suctioned. We then performed a left total nephrectomy, objectifying the CT findings as depicted in **Figure 1(a)** and **Figure 1(b)**. We also closed the peritoneal breach. Retroperitoneal lavage and perito-

neal lavage were performed. This was followed by the insertion of a passive/closed drain before closure of the abdominal wall. We removed the previous sutures from the lumbar wound in order to trim the wound and encourage healing by secondary intention. The operation was well tolerated as he received transfusion of two units of packed red blood cells, one intraoperatively and the other during the immediate post operative period. On the second postoperative day, bowel function resumed. Wound dressing as well as removal of the drain was done on the third day. On the fourth postoperative day, the patient was discharged and referred to a nephrologist. We have not had any further updates.

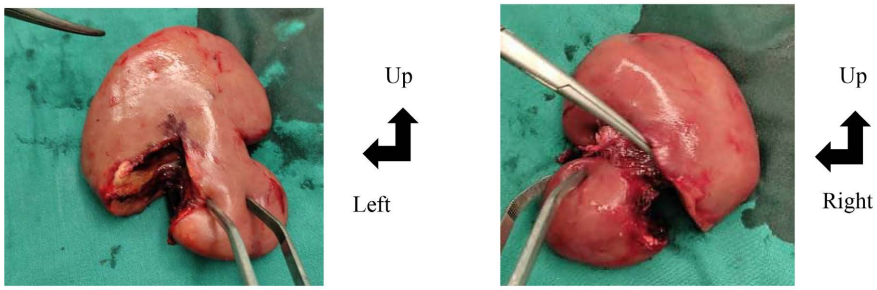

Figure 1. (a) Left kidney, anterior surface; (b) Left kidney, posterior surface.

3. Discussion

The rate of nephrectomy increases as renal trauma becomes more severe, particularly in cases of penetrating injuries. The mechanism of trauma must be taken into account when interpreting the American Association for the Surgery of Trauma (AAST) classification for renal injuries [1]. Renal trauma mainly affects young individuals between the ages of 10 and 40, with a clear male predominance [6]. These injuries are most often related to road traffic accidents [7]. However, in our case, it was related to an assault, due to a rise in crime in our area. The left side is often preferentially affected and haematuria is present in nearly two out of three patients. However, its severity is not correlated with the severity of the renal injury [8]. Ultrasound is the most accessible examination in our community and the quickest to perform in an emergency, but it does not always provide an accurate diagnosis and indicate the severity of renal injury in cases of trauma [7]. Abdominal and pelvic CT scans with early and late contrast injection remain the key examination for assessing kidney condition, performed within 24 hours in haemodynamically stable patients. They enable the detection of associated injuries and the staging of kidney injury. It is also used to quantify the extent of retroperitoneal haematoma, check the condition of the contralateral kidney and look for the presence or absence of pedicle injuries and intraperitoneal viscera [8]. In this case, occurring in a developing country, the patient who initially consulted at a primary health facility was allowed to return home without a urine dipstick, no imagery done nor appropriate hospital monitoring. The paucity of trained physicians at primary health care posts and the lack of proper imagery

tools at these sites is common in most developing countries. Also, most of these countries lack proper health insurance schemes, necessitating patients to pay directly from their pockets. Hence patients often tend to shy away from the better equipped centers because of fear of high financial cost. This could have avoided the emergency nephrectomy. There is therefore a need to train practitioners to always consider requesting for urine dipstick in cases of flank/lumbar injuries even in the absence of visible haematuria and a referral to CT scan equipped center if the dipstick turns positive for haematuria. This ensures that renal injury is never overlooked and appropriate care can be provided. The treatment of closed renal trauma remains controversial, but there is consensus on the appropriate treatment of grade 1 renal trauma (contusion), which is conservative. However, it is still unclear whether grade 2 to 5 renal ruptures should be treated conservatively or surgically, whether surgical treatment should be immediate or delayed, and whether it is possible to replace open surgery with minimally invasive techniques. In a patient with an isolated renal rupture, Gerota's fascia limits perirenal loss and, upon admission to hospital, the perirenal haematoma is already formed. Therefore, patients with renal rupture and no significant blood loss from extrarenal injuries should be managed conservatively. Immediate surgery should be avoided as much as possible without prior resuscitation [9]. In addition, close monitoring in hospital with regular biological tests and imaging is standard practice. In particular, a CT scan is recommended three to seven days after the injury, depending on the clinical course, in order to assess the haematoma, urinary extravasation and perfusion of the renal fragments [9]. Three to seven days after renal trauma, poorly perfused renal fragments are either reperfused or necrotic. Radical nephrectomy is considered when kidney preservation is not possible in cases of trauma. It is the most common procedure for high-grade renal trauma, despite the trend towards non-surgical management [5] [10] [11]. In our case, the trauma was penetrating, caused by a contaminated knife. The one-week delay favored the associated inflammatory syndrome related to a secondary infection of the haematoma or the necrosis of the devascularised renal fragments. The patient's state of shock could be explained by persistent uncompensated haemorrhage, probably related to the secondary worsening of an initial rupture at home. Conservative treatment could therefore not be considered since there was a state of persistent hypotension despite a fluid challenge. This state of shock was attributed to haemorrage and the septicemia. Minimally invasive approaches may be recommended in stable patients with devascularised renal fragments or when they are perfused but produce urine that does not communicate with the collecting system [9].

The patient was sent to nephrology after an uneventful early post operative period. He was then lost to follow up from both nephrology and urology services. This stands as major limitation to this study given that the long-term welfare could not be assessed notably his renal function. Moreover, it is worth noting that according to a study, nephrectomy post traumatic renal injury does not pose a significant adverse kidney outcome within the first 13 years [12].

4. Conclusion

Kidney trauma can occur through several possible mechanisms. Diagnosis is based on CT scans, which classify injuries into five stages according to their severity. Initial monitoring in a specialised hospital setting is important and allows follow-up examinations to guide subsequent decision-making. The rate of nephrectomy increases as renal trauma becomes more severe, particularly in cases of penetrating injuries. However, trends in the management of renal trauma indicate a decrease in the rate of nephrectomy for severe injuries over time.

Patient Consent

Consent was obtained from both patients prior to drafting of this piece.

Conflicts of Interest

The authors declare no conflicts of interest.

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