

Near fatal complication during laparoscopic donor nephrectomy early diagnosis and management

Sukhvir Singh

Consultant, Department of Anaesthesiology, Max Hospital, Mohali, Punjab, India.

*Corresponding Author: Sukhvir Singh. Consultant, Department of Anaesthesiology, Max Hospital, Mohali, Punjab, India.

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Abstract

Laparoscopic donor nephrectomy is widely used surgical procedure in retrieving kidney in transplantation. Living donor is usually healthy with unremarkable medical history and preoperative examination. Usually, these patients do not present as a high risk for anaesthesiologist but surgical complications can occur which can be fatal. We present a case of severe haemorrhage a result of slippage of clip from renal artery stump which was almost a fatal complication. In this case report we focus on vigilant monitoring and early intervention that saves life of a patient.

Key words: laparoscopic donor nephrectomy; haemorrhage; haemodynamic; fatal

Introduction

Chronic kidney disease is an important health problem because of high morbidity and mortality associated with it. Kidney transplantation is the treatment of choice for end stage renal disease which has a prevalence as high as 0.785% in India [1]. Living kidney donation has also grown with availability of minimally invasive laparoscopic donor nephrectomy procedures and better outcomes with live donor renal transplant procedures [2]. Also donor patients are healthy without any comorbid illness so lesser number of complications being reported. In this case report we report a near fatal haemorrhagic complication in laparoscopic donor nephrectomy. We found out very less number of cases of bleeding from renal stump as a fatal complication in literature.

Case report

64 year old male height 172 cm weight 78 kg with body mass index of 26.36 kg/m², ASA (American society of anaesthesiologists) grade 1 presented as a kidney donor for laparoscopic donor nephrectomy. His preoperative anaesthesia assessment was done with normal routine investigations without any comorbid illness. He was not taking any medicine; no previous history of surgery and his electrocardiogram and echocardiography were normal. Preoperative computed tomography scan was done for evaluation of his kidneys which shows normal renal vascular anatomy. He was taken inside operation theatre after application of standard monitors non-invasive blood pressure(bp), electrocardiogram(ecg), saturation(spo2) and temperature probe. 16gauge canula for intravenous access was inserted and anaesthesia was induced with fentanyl, propofol and atracurium for muscle relaxation for endotracheal intubation. Sevoflurane oxygen and air was used for

maintenance of anaesthesia. Patient positioning to left lateral decubitus position was done after Foley's catheterisation. All bony prominences were padded and position of patient was secured. Surgery was started with laparoscopic creation of pneumoperitoneum by insufflation of CO₂ into abdominal cavity. Renal vein and renal artery were identified, dissected and both were doubly clipped. Donor kidney was retrieved through Pfannenstiel incision by transplant surgeon. Incision was closed after haemostasis of renal bed and drain was placed. Throughout the surgery vitals remain stable with bp 122/80, pulse rate 82, spo₂ of 100 and end tidal CO₂ (etco₂) of 37. Immediately after closure of laparoscopic ports patient had sudden hypotension with fall in bp to 60/30, bradycardia of 35, fall in etco₂ to 15 and spo₂ to 88. Patient did not respond to a fluid bolus of one litre crystalloid and vasopressor mephentermine with drop of bp to 50 systolic and drop in pulse rate to 30 and peripheral pulses non palpable and ecg showing pulseless electrical activity and spo₂ fall to 80 on 100 % of oxygen. Carotid pulse was also not palpable and cardiopulmonary resuscitation (cpr) was started immediately after changing position from lateral to supine. Injection adrenaline 1 mg was given with continued chest compressions meanwhile call was sent to cardiologist. Fluid bolus of 2 litre crystalloid and 500 ml of colloid 6% hetastarch was given with continuation of cpr as per ACLS (advanced cardiac life support). Patient was placed in Trendelenburg position thinking of diagnosis of embolism. While doing cpr we noticed 300 ml of fresh blood in drain. After 6 cycles of cpr as per acls and 6 mg of adrenaline return of spontaneous circulation was achieved with heart rate of 140/min and bp of 80/60 spo₂ of 95. Echocardiography was done by cardiologist which shows poor myocardial contractility normal left and right atrium, an intact interatrial septum, a normal left and right ventricular function, and no air or particulate in the atria, ventricles and

rule out embolism. With increase in blood in drain to 500 ml decision was made to do exploration surgery. Meanwhile triple lumen subclavian vein central line and arterial line was secured, arterial blood gas sample and call to blood bank was sent. On opening up of abdomen from same incision bleed from renal artery with slippage of both clips was noted and 2 litre of collected blood was removed. ABG report shows acidosis (ph 7.16 po₂ 93 pco₂ 38 hco₃ 14 lactate 10 hb 7) inotropic support with nor adrenaline was started, 3 units of packed red blood cells (prbc) were transfused with call sent for more prbc. Patient maintained bp 100/70 pr 110/min spo₂ 99 after control of bleeding with gradual tapering of inotropic support. Closure of incision was done and patient shifted to surgical intensive care unit intubated for further monitoring with bp 122/78, pr 98/min and spo₂ of 100. Patient remain hemodynamically stable post op in icu with tapering off inotropic support and improvement in arterial blood gas analysis (ph 7.38 po₂ 180 pco₂ 34 hco₃ 23 lactate 2 hb 9). Patient was extubated in evening with no neurological deficit and was discharged on post-operative day five.

Discussion

Laparoscopic donor nephrectomy is widely used procedure because of relatively less pain of surgery, shorter hospital stay and faster return to work [3]. There is general sense that laparoscopic donor nephrectomy is quite a safe procedure however, even fully evaluated healthy donor can have life threatening surgical complication as it happens to be bleeding in our case [4]. Intraoperative vitals of donor remain stable throughout surgery but after closure of ports there was sudden fall in blood pressure, bradycardia and saturation. After confirming no disconnections of circuit, no ventilator failure and endotracheal tube in place we first thought of air embolism as there was fall in end tidal carbon dioxide (et co₂) but echocardiography ruled out its possibility. Gas embolism can occur due to vascular injuries also spontaneous rupture of abdominal veins caused by the intra-abdominal pressure of the pneumoperitoneum [5].

After giving fluid bolus and initial resuscitation and trendelenburg positioning with no response in haemodynamic we looked into other causes and decided to do reexploration surgery while continuing cardio pulmonary resuscitation as there was fresh bleed in drain. Surgeon find renal artery stump bleeding due to slippage of clip. Haemodynamics improved after control of bleeding and blood transfusions. Failure of surgical clips can lead to fatal complication as in our case. Matas et al in a survey of 234 renal transplant programs, found 2 donor deaths and 1 case of persistent vegetative state, all from haemorrhagic shock, in 10,828 cases [6]. Mjoen et al reported intraoperative bleeding as a major complications in lap donor nephrectomy with necessary conversion to open surgery [7]. Fatal haemorrhage due to loss of arterial control jeopardizes donor life and health, especially when it occurs in the postoperative period. Vascular transfixion for arterial control provides the

best vascular control of major vessels as compare to other methods [8]. Overall mortality in laparoscopic nephrectomy is between 0.03 to 0.04% [9]. Despite low mortality extra care should be taken while applying clips. In our case we were able to timely intervene as it occurs on operation table, had it been post-operative ward it would have proved fatal.

Thus, to conclude though laparoscopic donor nephrectomies are performed on health individuals they have complications especially bleeding that can be sudden and serious. Anaesthesia team should be vigilant during intraoperative and also postoperative period to avoid fatal consequence and should act aggressively if there is any change of haemodynamic parameters. Applying these principles to the living kidney donor may reduce risk to life-endangering haemorrhage for these patients who offer a living gift to their recipients.

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