



## Case Reports

# Acute Kidney Injury Secondary to Cell Saver in Posterior Spinal Fusion

Anas A. Minkara, BHS, Albert Y. Lin, MD, Michael G. Vitale, MD, MPH,  
David P. Roye, Jr, MD\*

Columbia University Medical Center, 3959 Broadway, 8 North, New York, NY 10032, USA

Received 11 October 2016; revised 1 February 2017; accepted 19 March 2017

### Abstract

**Background:** Autologous blood transfusion, commonly referred to as cell saver, is frequently used in spinal fusion to salvage red blood cells because of the risk of significant intraoperative blood loss. This case report describes a case of acute kidney injury (AKI) secondary to cell saver use. Our objective is to increase the knowledge about the process of red blood cell salvage and this exceedingly rare complication.

**Methods:** Chart and renal biopsy results for a single case were reviewed and reported in this retrospective study.

**Results:** A healthy 18-year-old male patient underwent posterior spinal instrumentation and fusion for adolescent idiopathic scoliosis with utilization of intraoperative autologous blood transfusion. The patient subsequently developed hematuria and AKI with a peak creatinine of 13.9 mg/dL. An extensive clinical workup, including autoimmune serology, excluded any identifying causes. A renal biopsy showed pigment-induced acute tubular necrosis.

**Conclusions:** This case, to our knowledge, is the first and only case report of AKI secondary to cell saver demonstrated by renal biopsy. The literature has shown both the benefit of cell saver by decreasing the need for allogeneic transfusion and the risk of transient hematuria. However, this case demonstrates the importance of monitoring patients for potential complications.

© 2017 Scoliosis Research Society. All rights reserved.

*Level of Evidence:* Level IV

*Keywords:* Acute Kidney Injury; Adolescent Idiopathic Scoliosis; Autologous Blood Transfusion; Cell Saver; Pigment-Induced Acute Tubular Necrosis

### Introduction

Intraoperative autologous blood transfusion, commonly referred to as cell saver, is essentially a three-step process in which blood is collected via a suction device, filtered, and subsequently reinfused (Fig. 1). Blood is first anticoagulated with heparinized saline. It is then passed through a semipermeable membrane to filter out free hemoglobin, heparin, white blood cells, platelets, and plasma [1]. Cell saver is frequently used in spinal fusion to salvage red blood cells (RBCs) due to the risk of significant intraoperative blood loss [2–4]. Hemolysis of the filtered blood may occur as a result of several mechanisms, including mechanical trauma from centrifugal washing (Step 2 of Fig. 1), high suction pressures, and low-diameter suction

devices as evidenced by free hemoglobin in collection reservoirs [5], hypotonic fluid irrigation, and aspiration of clotted blood [6].

When free hemoglobin is infused, it is rapidly bound to haptoglobin; however, larger doses can severely diminish haptoglobin levels, leading to free hemoglobin in the plasma and subsequent hematuria [7]. In this case report, we describe the first case of an 18-year-old male patient (Fig. 2) with pigment-induced acute kidney injury secondary to cell saver demonstrated by renal biopsy (Figs. 3 and 4).

### Case Report

A healthy 18-year-old-male patient with adolescent idiopathic scoliosis was admitted for posterior spinal instrumentation and fusion from T2 to L2. The main thoracic curve from T5 to T12 measured 55° (Fig. 2). Additionally, he experienced chronic apical and scapular

Author disclosures: none.

\*Corresponding author. New York Presbyterian Morgan Stanley Children's Hospital, 3959 Broadway Suite 800 North, New York, NY 10032, USA. Tel.: 212-305-9367; fax: 212-342-1443.

E-mail address: dpr2@cumc.columbia.edu (D.P. Roye).

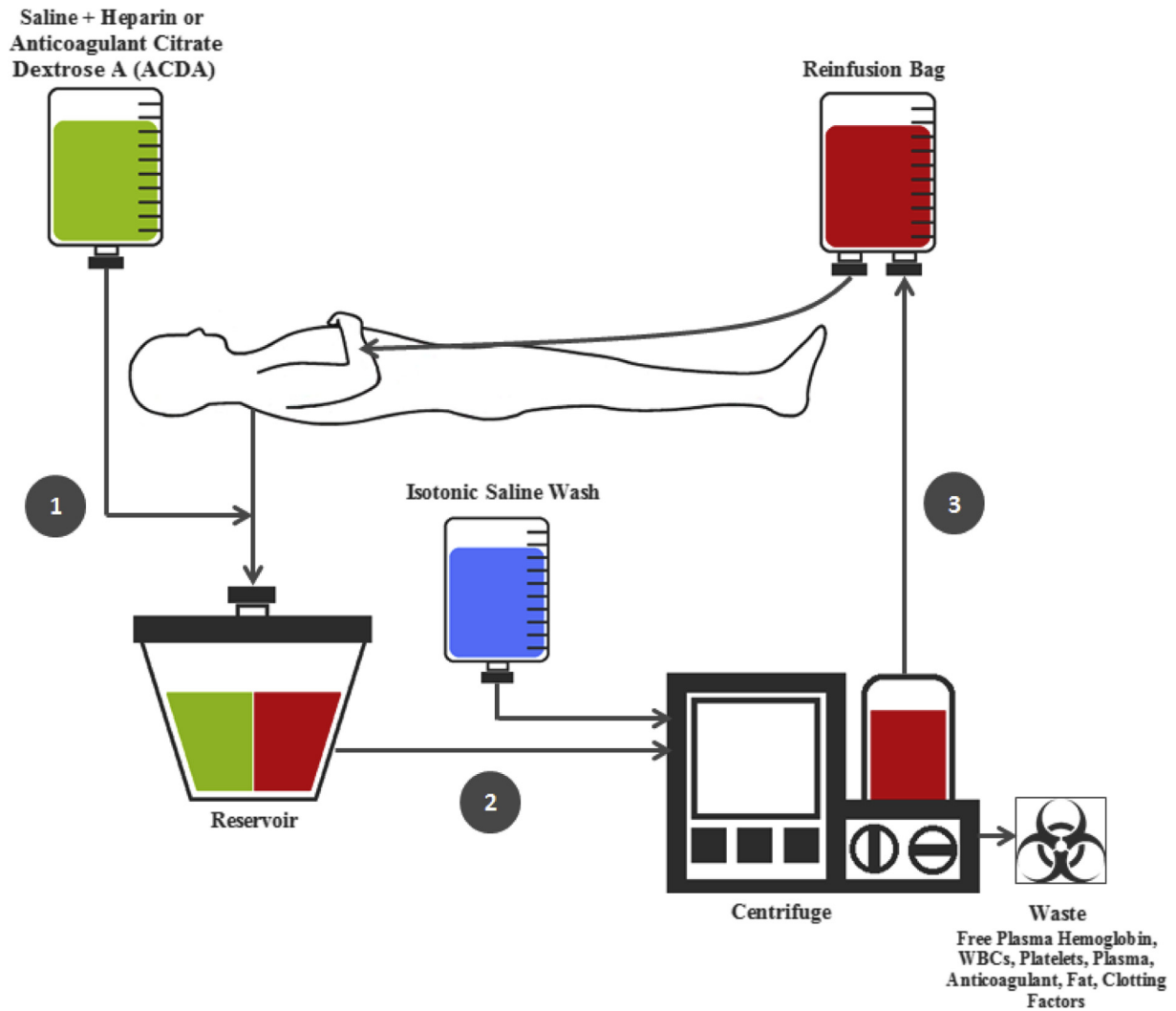


Fig. 1. Process of Autologous Blood Transfusion.

pain on the right side. Otherwise, the patient had no significant medical history.

Intraoperatively, the patient received 607 mL of autologous blood, which was spun from 1704 mL utilizing a cell salvage machine fitted with a microfilter. Estimated blood loss was 800 mL. Perioperative antibiotics, which were dosed and timed correctly, included cefazolin and tobramycin. The patient received routine fluid resuscitation and deep vein thrombosis prophylaxis with a compression therapy system. The patient tolerated the procedure without any complications, and was subsequently transported to the pediatric intensive care unit in stable condition.

Overnight on postoperative day (POD) 1, creatinine increased from 1.2 to 2.1 mg/dL. Dark-colored urine was noted in the Foley collection bag, and urinalysis showed 2+ protein with 3+ hemoglobin and 180 RBCs/hpf without RBC casts. Intravenous fluid hydration was increased for possible acute kidney injury (AKI). However, creatinine continued to increase over the course of POD 2–3 to a peak of 11.4 mg/dL and urine output dropped to 10–15 mL/h.

Nephrology was consulted because of a concern of nephritis due to dysmorphic RBCs on urinalysis.

A renal biopsy was performed on POD 3 to evaluate the etiology of the AKI since no clear intraoperative or postoperative cause was identified. Renal ultrasound showed evidence of parenchymal renal disease. Because of a maternal history of Sjögren disease, autoimmune labs were ordered, all of which were negative. The workup included antinuclear antibody, anti-double stranded DNA, anti-C3 and C4, lupus anticoagulant, anti-Smith, anti-Ro,  $\beta_2$  immunoglobulin G, and  $\beta_2$  immunoglobulin M. The patient was started on continuous venovenous hemofiltration as a result of volume overload and increased oxygen requirements. CVVH is a short-term renal replacement therapy for acute kidney injury that is commonly used in the intensive care unit setting. A blood transfusion was also performed while the patient was on CVVH. However, a transfusion reaction consisting of chills and hypothermia occurred, leading to discontinuation of the transfusion and resolution of symptoms.

Download English Version:

<https://daneshyari.com/en/article/5712534>

Download Persian Version:

<https://daneshyari.com/article/5712534>

[Daneshyari.com](https://daneshyari.com)