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Case report

Perioperative visual loss after excision and autografting of a thermal burn to the back

Thea P. Price [a,b,c,*], Anna Ivashchenko [b,c], Michael J. Schurr [b,c]

[a] Department of General Surgery, University of Colorado Hospital, 12605 E. 16th Ave., Mail Stop F796, Aurora, CO 80045, United States

[b] Thomas Jefferson University, 1025 Walnut St. Suite 620, Philadelphia, PA 19107, United States

[c] Division of Burn Surgery, University of Colorado Hospital, 12605 E. 16th Ave., Mail Stop F796, Aurora, CO 80045, United States

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ABSTRACT

Peri-operative visual loss is an uncommon and poorly understood entity whose severity launched a Practice Advisory to identify peri-operative risk factors including prone positioning, anemia, hypotension, blood loss >44.7% of EBV, and surgical time >4–6.5 h. Contributing co-morbidities are obesity, tobacco, malnutrition, and PAD, which reduce blood flow to the optic nerve.

We describe a patient with POVL focusing on the peri-operative course defined as the immediate preoperative assessment through discharge to compare the hospital course with previous reports of POVL in cardiac and spine operations.ss

A middle-aged man admitted to the burn unit with 10% deep partial and full thickness burns to the back and neck underwent excision and autografting while prone. He was subsequently diagnosed with ischemic optic neuropathy and blindness. Co-morbidities were tobacco, malnutrition (albumin of 2.6 g/dl), and obesity (BMI 30.1). Preoperative risk assessment included anemia and prone positioning. Intra-operative hypotension to SBP 75 mmHg was noted. Operative duration was 5 h. Blood loss was estimated to be 43.7% of EBV.

Risk factors for POVL are present in many prone burn operations as these patients have long operative times and significant blood loss. Thus, minimization of these factors where possible is advised.

1. Introduction

Perioperative visual loss (POVL) has been garnering attention recently as a rare but catastrophic complication caused chiefly by ischemic optic neuropathy (ION). Case reports date to 1988 but the first multicenter case control study was performed in 2012 [1,2]. This entity remains poorly understood and has been prevalent in spine and cardiac surgery; where incidence varies from 0.017 to 0.2% [2].

Despite its low incidence, the severity of this potentially preventable complication has led to the launch of a Practice

* *Corresponding author at*: 1025 Walnut St. Suite 620, Philadelphia, PA 19107. Tel.: +1 501 940 9656; fax: +1 215 503 5788.
E-mail address: thea.p.price@gmail.com (T.P. Price).

Abbreviations: EBV, estimated blood volume; POVL, peri-operative visual loss; PAD, peripheral arterial disease; SBP, systolic blood pressures; ION, ischemic optic neuropathy; BMI, body mass index; TBSA, total body surface area; Hb, hemoglobin; BP, blood pressure; HR, heart rate; PION, bilateral posterior Ion; CT, computed tomography; IOP, intraocular pressure; NIS, Nationwide Inpatient Sample; CBT, carotid body tumors.

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Advisory to identify and eliminate its perioperative risk factors. These remain controversial but include prone positioning, anemia, hypotension, large volume blood loss, and prolonged surgical times >4–6.5 h. Contributing comorbidities are male sex, obesity [body mass index (BMI) ≥ 30], tobacco, malnutrition, and atherosclerosis [2–4]. Each factor may contribute to a reduction in blood flow to the optic nerve [2].

The parallel between the risk factors mentioned and those inherent in prone burn cases are not difficult to draw. We present a case report of a 45 year old male patient who underwent a prone operation and subsequently developed a permanent unilateral blindness due to ION. To our knowledge, this is the first time this entity has been described in the burn literature.

2. Case report

A 45 year old male [160 cm, 77 kg, body mass index (BMI) 30.1 kg/m^2] presented to a burn/trauma intensive care unit with 10% total body surface area (TBSA) thermal injury to the back, neck, and shoulders (Fig. 1). Injury was sustained from a burning article of clothing 48 h prior to admission. Admission hemoglobin (Hb) was 12.2 g/dl, blood pressure (BP) 163/98 mmHg, and normal sinus rhythm on ECG. His past medical history was significant for alcohol withdrawal and previous rhinoplasty following trauma. He had no history of general anesthetic complications. He had no allergies and took no medications. He consumed two 40 oz. beers per day.

The patient was taken to the operating room on the day after admission. Anesthesia was induced with midazolam 2 mg and propofol 160 mg; he was then intubated with an 8–0 endotracheal tube facilitated by atracurium 50 mg. The patient's eyes were protected with chloramphenicol ointment before being taped shut. His preoperative BP was 104/69 with heart rate (HR) 101 and preoperative Hb was 12.6 g/dl. The total length of procedure was 5 h 4 min from entry to the OR to transfer to the BTICU. The length of case was 4 h 3 min. Initially 1 h 13 min were spent in the supine position while skin was harvested.

After donor harvest from the left lower extremity, the patient was transitioned to a prone position on a padded mirrored headrest and a Wilson frame (Fig. 2). His neck was maintained in the midline position with slight flexion so that his back was in a neutral/horizontal position and a slightly dependent head position. An extensive tangential excision, debridement, and autografting was completed over 3 h 31 min. Eye position and facial edema were checked every 20 min, as documented in the anesthesia record, to avoid external compression.

Fig. 1 – 10% TBSA deep partial and full thickness thermal injury to the posterior neck and back.

The BP ranged from 140/96 mmHg prior to induction to a low of 79/52 following propofol administration and intraoperatively ranged from 94/65 to 126/114. Phenylephrine boluses totaling 700 mcg were administered. His HR remained between 82 and 102 bpm. Blood loss was estimated at 750 ml and was repleted with 600 ml crystalloid, 1000 ml colloid (5% albumin).

At the end of the operation, the patient was extubated and transferred to the postoperative recovery room in the supine position. According to nursing records, both pupils were equal and reactive to light and accommodation in the supine position and the patient had no visual complaints. Postoperative hgb was 7.1 mg/dl, a blood loss of 43.7% of estimated blood volume (EBV). On postoperative day 2 the patient

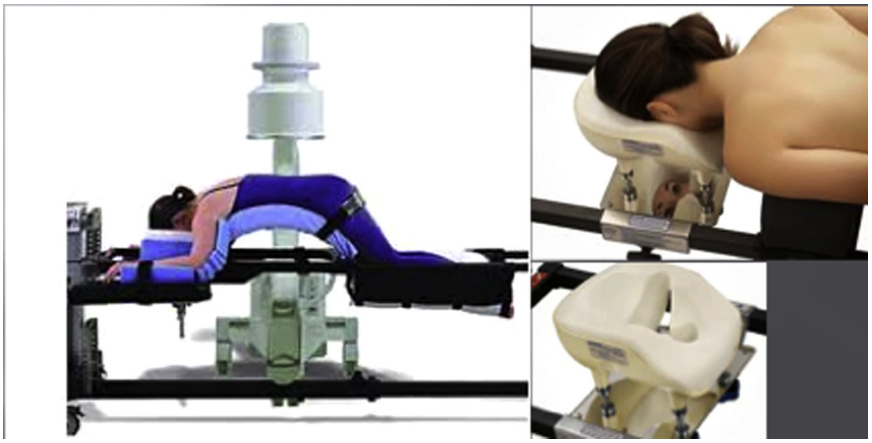

Fig. 2 – Wilson frame and headrest utilized during prone positioning.