Substernal goiter excision in a Jehovah's Witness

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ABSTRACT

Jehovah's Witnesses present a unique challenge in oral and head and neck surgery. We report a case of a substernal goiter excised on a Jehovah's Witness without the use of blood transfusion, in accordance with the patient's beliefs. Additionally, we review the literature on the care of this patient population, focusing on preoperative optimization, perioperative management, and postoperative care.

KEYWORDS Allogenic blood transfusion; Jehovah's Witness; substernal goiter

Although about 80% of patients undergoing major oral and head and neck surgery may require allogenic blood transfusions,¹ there is limited data focusing on the care of Jehovah's Witnesses undergoing such surgery. With approximately 8.6 million Jehovah's Witnesses worldwide, surgeons are likely to encounter this population. To highlight how to optimize preoperative, perioperative, and postoperative care, we discuss a case with the potential for massive hemorrhage in a Jehovah's Witness patient who refused blood and blood products.

CASE REPORT

A 65-year-old black woman presented to the maxillofacial oncology and reconstructive surgery clinic for evaluation of a neck mass. She complained of globus, shortness of breath, and dysphagia secondary to a mass in her anterior neck. Her medical history was significant for anemia and hypothyroidism. On physical examination, she appeared in no acute distress and able to communicate without hoarseness. She had a diffusely palpable 10 cm left thyroid mass. Computed tomography of the neck with contrast demonstrated a 10.8 × 5.5 × 4.3 cm mass arising from the left lobe of the thyroid with extension into the mediastinum with deviation and displacement of the trachea (*Figure 1*).

After our evaluation, a left total lobectomy was recommended for her compressive symptoms and potential airway compromise. The risks, benefits, and alternatives to excision

of this mass were thoroughly discussed, focusing on the risk of catastrophic hemorrhage. Specifically, the use of cell saver, hemodilution, autotransfusion, and potential blood products were reviewed.

She elected to consult her local religious leader about the upcoming surgery. During this time, she was also referred to hematology for perioperative optimization. She was originally offered autotransfusion by donating blood preoperatively, but she was unable to afford this potential treatment. In addition, the exogenous nature of erythropoietin (EPO) injections was rejected as potential therapy. The final recommendation by the hematologist was iron supplementation at 325 mg daily, folic acid 1 mg daily, and vitamin B12 1000 mcg daily.

Over 1 month, her hemoglobin improved from 10.8 g/dL to 11.8 g/dL and she was subsequently taken to the operating room for a left hemithyroidectomy. She was positioned in a reverse Trendelenburg tilt, along with a generous shoulder roll. An anterior cervical neck incision was made to expose the thyroid and provide access to surrounding structures. The strap muscles were then divided using ultrasonic cautery. We performed a superior-to-inferior approach completing dissection and ligation of the superior, middle, and inferior poles. Two negative pressure drains were placed prior to skin closure. The final specimen was an 11.0 × 6.5 × 4.5 cm multinodular goiter with no evidence of malignancy. Postoperatively, her hemoglobin level was 10.5 g/dL and she had an uneventful recovery with no hypocalcemia, dysphonia, or

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Figure 1. Computed tomography in (a) sagittal and (b) coronal planes demonstrating a large mass arising from the left thyroid with extension into the superior mediastinum and deviation and displacement of the trachea toward the right side.

dysphagia. Her preoperative globus sensation and dyspnea resolved completely.

DISCUSSION

The Jehovah's Witness religion was founded in Philadelphia, Pennsylvania, in 1872 by Charles Russell. The Watchtower, the governing body of Jehovah's Witnesses, introduced a blood ban in 1945 based on the interpretation of several passages of the Bible. Genesis 9:3-4—"every moving animal that is alive may serve as food for you. Only flesh with its soul—its blood—you must not eat"—is interpreted to prohibit the ingestion or transfusion of blood. Additionally, Leviticus 17:11-14 states, "for the life of a creature is in the blood" and "you must not eat the blood of any creature, because the life of every creature is its blood; anyone who eats it must be cut off," which is believed to forbid the storage of blood. Acts 15:19-21, through the statement to "abstain from ... blood," is believed to prohibit the use of blood products.

Thus, the use of whole blood or its four major components (red blood cells, white blood cells, platelets, and blood plasma) is forbidden. However, individuals have discretion to accept components such as albumin, clotting factors, immunoglobulins, and prothrombin complex concentrates.^{2,3} Discussion regarding the patients' wishes regarding which blood products they are willing to accept must be carefully documented and occur in the absence of third parties to remove potential coercion.²

One method for optimization includes recombinant-human EPO injection. EPO is a glycoprotein cytokine secreted by the kidney in response to hypoxia and stimulates erythropoiesis in the bone marrow. EPO has been shown to be most effective when used before elective procedures and is

capable of stimulating an increased hemoglobin equivalent to that of 1 unit of packed red blood cells per week of treatment.^{1,3} Intravenous iron in conjunction with EPO has been shown to reduce transfusion requirements significantly,⁴ and supplemental B₁₂ and folate may also be considered, especially in patients with suspected malnutrition or malignancy.³ Furthermore, if the patient is taking any anti-coagulant medications, it should be stopped or reversed, if necessary.³

Meticulous surgical technique is critical to minimize hemorrhage and associated complications. Staging complex procedures, when appropriate, can minimize blood loss and allow ample time for medical optimization or recovery from acute blood loss.⁵ The head and neck pose a unique surgical challenge given the rich vascular supply. Electrocautery (monopolar or bipolar), hemostat clamps, and tourniquets, where appropriate, may help lessen blood loss. Reverse Trendelenburg tilt up to 30° can reduce arterial pressures in the head and neck while also relieving venous congestion, lessening hemorrhage.⁶

Topical hemostatic agents such as thrombin, fibrinogen, gelatin, and/or cellulose are routinely applied, and in conjunction with direct pressure can help minimize hemorrhage.¹ Systemic antifibrinolytics agents, such as lysine analogs tranexamic acid and epsilon aminocaproic acid, preserve clots formed at the site of hemorrhage through inhibition of plasmin.^{1,7} Antifibrinolytics may be used prophylactically in patients with a high risk of bleeding.⁷

The incidence of hemorrhage in thyroid surgery ranges from 0% to 14.3%, with a mean between 1% to 4.2%, depending on the center.⁸ Interestingly, there is no consensus on the use of drains in thyroid surgery. Several studies have

shown that the number or presence of drains is not associated with decreased postoperative hemorrhage and may lead to an increased length of hospital stay, higher risk of infection, and higher risk of postoperative bleeding.⁶ In contrast, others have found that the use of negative pressure drains reduces the risk of potentially catastrophic complications without any increased risk of bleeding or infection. We find drains allow objective assessment and hasten intervention, if necessary, prior to accumulation of blood in the neck. Most postoperative hemorrhages occur within the first 8 h of surgery and may be life threatening. Risk of dyspnea, neck edema, and hematoma warrant close postoperative monitoring.

In conclusion, oral and head and neck surgery has the potential for significant hemorrhage, necessitating allogenic transfusions. Proper preoperative planning and optimization in conjunction with meticulous surgical technique and postoperative management can offer Jehovah's Witnesses successful surgical care in accordance with their religious beliefs.

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1. Weber RS. A model for predicting transfusion requirements in head and neck surgery. *Laryngoscope*. 1995;105(S2):1–17.
2. Lawson T, Ralph C. Perioperative Jehovah's Witnesses: a review. *Br J Anaesth*. 2015;115(5):676–687. doi:10.1093/bja/aev161.
3. Shander A, Javidroozi M. The approach to patients with bleeding disorders who do not accept blood-derived products. *Semin Thromb Hemost*. 2013;39(2):182–190. doi:10.1055/s-0032-1333541.
4. Lin DM, Lin ES, Tran MH. Efficacy and safety of erythropoietin and intravenous iron in perioperative blood management: a systematic review. *Transfus Med Rev*. 2013;27(4):221–234. doi:10.1016/j.tmr.2013.09.001.
5. Rabinowitz MR, Cognetti DM, Nyquist GG. Blood-sparing techniques in head and neck surgery. *Otolaryngol Clin North Am*. 2016;49(3):549–562. doi:10.1016/j.otc.2016.02.008.
6. Moumoulidis I, Martinez Del Pero M, Brennan L, Jani P. Haemostasis in head and neck surgical procedures: Valsalva maneuver versus Trendelenburg tilt. *Ann R Coll Surg Engl*. 2010;92(4):292–294. doi:10.1308/003588410X12664192076412.
7. Adelola OA, Ahmed I, Fenton JE. Management of Jehovah's Witnesses in otolaryngology, head and neck surgery. *Am J Otolaryngol*. 2008;29(4):270–278. doi:10.1016/j.amjoto.2007.08.006.
8. Godballe C, Madsen AR, Pedersen HB, et al. Post-thyroidectomy hemorrhage: a national study of patients treated at the Danish departments of ENT head and neck surgery. *Eur Arch Otorhinolaryngol*. 2009;266(12):1945–1952. doi:10.1007/s00405-009-0949-0.