

# Utilizing acute normovolemic hemodilution for blood conservation in myomectomy for Jehovah's Witnesses: A case report

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## Abstract

Myomectomy for Jehovah's Witnesses presents a unique challenge because of their religious beliefs against blood transfusions. In this case report, we describe the successful management of a Jehovah's Witness patient with 22-week-sized uterine fibroids complicated by menorrhagia, emphasizing a multidisciplinary approach to blood conservation while respecting the patient's faith. She had a presenting hematocrit of 38%, which dropped to 33% just before surgery and subsequently had acute normovolemic hemodilution (ANH) along with meticulous surgical techniques, resulting in minimal blood loss and avoidance of allogeneic blood transfusions. She had good postoperative recovery and was discharged with hematocrit of 34%. This approach highlights the importance of understanding and accommodating patients' religious beliefs in surgical practice. Furthermore, it underscores the effectiveness of ANH as a viable alternative for blood conservation in high-risk surgical procedures.

## Keywords

Obstetrics/gynecology, autologous transfusion, uterine fibroid, acute normovolemic hemodilution, Jehovah's Witness, case report

## Background

Blood conservation is a primary goal in surgical practice, especially for patients who refuse allogeneic blood transfusions. Patients with uterine fibroids often present with anemia resulting from menorrhagia. Preoperative optimization of blood levels in these women is often complicated by concurrent menorrhagia, further diminishing hematocrit levels even with the administration of antifibrinolytics and non-steroidal anti-inflammatory drugs.

Similarly, myomectomy is associated with a 10% overall risk of blood transfusion, with open myomectomy having nine times the odds of transfusion.<sup>1</sup> Other risk factors for transfusion include preoperative anemia, Black race, prolonged surgery, high fibroid burden (>10), previous surgery, and posterior incision.<sup>1,2</sup> These factors make blood transfusion almost unavoidable during the management of some patients with symptomatic uterine fibroids.

Jehovah's Witness members staunchly oppose blood transfusions because of religious beliefs, posing a significant dilemma in the management of patients undergoing blood-loss surgeries such as myomectomy. A deeper exploration into the origins of this belief, rooted in scriptures such as

Leviticus 17:12-14, Acts 15:29, and Genesis 9:4, reveals that the central prohibition concerns the discontinuity of blood in circulation.<sup>3</sup> This understanding offers a pathway to managing Jehovah's Witness patients in a manner that aligns with their faith as well as other patients for whom blood transfusion is not desirable.

In this report, we present an uncommon management approach in a Jehovah's Witness patient undergoing myomectomy, focusing on strategies for blood conservation while respecting the patient's religious convictions.

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## Clinical presentation

The patient, a nulliparous woman in her early 30s, presented to our gynecological clinic with a 6-year history of progressive abdominal swelling and 2 years of heavy menstrual bleeding. At presentation, her menstrual length was 9 days, requiring four-to-five heavily soaked perineal pads as opposed to two pads in her previous 3-day menstrual length. She had no intermenstrual bleeding or, bleeding diathesis. Similarly, the abdominal swelling had extended above the umbilicus. Despite the heavy bleeding, she had not experienced fainting spells, although she occasionally experienced dizziness. She had been on self-prescribed iron and other hematinics.

A physical examination revealed a 22-week-sized uterus with nodular surface. These were confirmed by ultrasound imaging, which revealed multiple uterine fibroids involving all uterine planes, with the largest measuring 8 by 5 cm in the posterior fundal region. Her full blood count showed a packed cell volume (PCV) of 38%, with other parameters within normal ranges. Following a review from the hematologist, recombinant erythropoietin was deemed unnecessary, and she was continued on hematinics. She was started on oral tranexamic acid (500 mg) three times daily for 5 days of menstrual flow and scheduled for surgery during the proliferative phase of her menstrual cycle.

However, her PCV dropped to 33% during the preoperative workup. After counseling and involving Jehovah's Witness hospital liaison committee, the patient agreed to undergo acute normovolemic hemodilution (ANH). An interdisciplinary review involving gynecologists, hematologists, and anesthesiologists was conducted, and surgical plans were established.

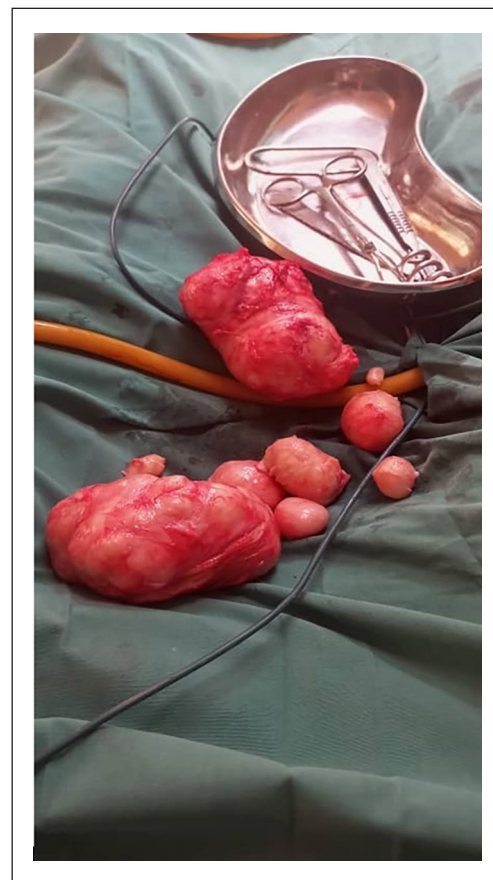
In the operating theater, phlebotomy was performed via the brachial vein under gravity by the hematologist, with the blood transfusion set already inserted and secured. Just before the completion of the donation, the blood bag filled with 500 ml of whole blood was elevated, and transfusion was initiated at a rate of 4 drops per minute to maintain continuity of circulation (Figure 1). The donation end was then disconnected. Additionally, the patient received 1.5 l of Ringer's lactate infusion. Epidural anesthesia was administered, and the surgery proceeded.

To minimize blood loss, a uterine artery tourniquet was applied at the level of the uterine isthmus using a size 16 Foley's catheter, releasing it twice at 45- to 60-min intervals during the 2-h surgery to prevent uterine ischemic injury. Diathermy was utilized to cauterize bleeding vessels, and each major enucleated myoma bed was closed before proceeding with subsequent ones.

A total of 19 myomas, including 2 submucous, were enucleated (Figure 2), with 1 in 200,000 diluted vasopressin instilled into the uterine wound edges after enucleation. Intraoperative blood loss was 400 ml. An abdominal drain was inserted for monitoring, which drained 50 ml of



**Figure 1.** Immediate commencement of transfusion under gravity before completion of phlebotomy to maintain continuity of circulation.



**Figure 2.** Some enucleated uterine fibroid nodules.

serosanguinous fluid and was removed on the second postoperative day.

## Outcome and follow-up

Following surgery, the patient was discharged on the third postoperative day with a PCV of 34%. She was seen 2 weeks later in the postoperative clinic visit, and she had no complaint.

## Discussion

In the presented case, a Jehovah's Witness patient with symptomatic uterine fibroids underwent myomectomy with a multidisciplinary approach involving gynecologists, hematologists, and anesthesiologists. The patient's preoperative optimization was hindered by menorrhagia, necessitating the utilization of ANH for blood conservation.

Respecting the faith of Jehovah's Witness patients and their need to avoid blood transfusions remains a thorny issue in the management of patients requiring surgery, especially in blood-loss surgeries such as myomectomy. Alternative treatments such as hysterectomy and uterine artery embolization were not acceptable as she was desirous of pregnancy.<sup>4</sup>

With the increasing population of Jehovah's Witnesses, obstetricians and gynecologists are expected to have a protocol to cater for the peculiar needs of Jehovah's Witnesses in their practice.<sup>5-7</sup> While allogenic blood transfusion as well as preoperative autologous deposit are strictly prohibited by Jehovah's Witness doctrine, ANH is left to the discretion of individuals and remains acceptable to many adherents provided the blood circuit is not interrupted,<sup>8</sup> as it was for our index case.

ANH involves withdrawing blood from the patient immediately before induction of anesthesia, followed by the infusion of crystalloid solutions to maintain normovolemia.<sup>9</sup> The shed blood is collected and reinfused intraoperatively, ensuring continuity of circulation in accordance with the patient's religious beliefs.<sup>10</sup> The volemic replacement was three times the volume removed to cater for the interstitial escape of crystalloid.<sup>10</sup> This approach proved successful in our case, with stable intraoperative hemodynamics and no requirement for blood transfusions.

While ANH can be used in patients with rare blood groups, patients with multiple alloantibodies and those in whom large blood loss is anticipated, the Jehovah's Witness patients present a unique requirement of ensuring continuity of blood all through the process.<sup>10</sup>

In the absence of the three-way connector, which is used to ensure continuity of flow in ANH, we innovatively used gravity for phlebotomy with immediate antigavity transfusion.

Beyond meeting the patient's faith need, the technique has the advantage of obviating the need for testing, reducing the risk of transfusion-related infection, as well as maintaining functional platelet and coagulatory factors in the patient.<sup>11</sup>

Factors such as race, the type of myomectomy, and a high fibroid burden increased our patient's risk of intraoperative bleeding.<sup>12,13</sup> Therefore, surgical techniques aimed at minimizing blood loss were also employed, including the use of uterine artery tourniquets, meticulous hemostasis with diathermy, and the instillation of diluted vasopressin to reduce bleeding from the uterine wound edges.<sup>14</sup> The choice of epidural anesthesia, with its sympatholytic effect, also helps reduce surgical blood loss.<sup>15</sup>

Securing venous access for phlebotomy and transfusion is crucial for the success of ANH without interrupting the patient's circulation. This can be challenging for obese patients and patients with non-prominent veins; thus, it should be considered during the planning phase.

The collaborative effort of the surgical team, along with effective communication with the patient and involvement of hospital liaison personnel for Jehovah's Witnesses, facilitated a successful surgical outcome while respecting the patient's religious beliefs. Postoperatively, the patient was discharged with stable levels, highlighting the efficacy of the integrated approach in managing Jehovah's Witness patients undergoing myomectomy.

## Conclusion

The management of Jehovah's Witness patients undergoing myomectomy requires a tailored approach that addresses the unique challenges of blood conservation while honoring the patient's religious convictions. Strategies such as ANH, along with meticulous surgical techniques, play a pivotal role in ensuring optimal outcomes in these patients. Collaborative efforts involving a multidisciplinary team and effective communication with the patient are essential for navigating the complexities of surgical management in this population.

As a case report of a single patient, there are limitations to generalizability. However, further research and sharing of experiences in managing Jehovah's Witness patients undergoing surgery will help refine and optimize clinical practices in this challenging clinical scenario.

## Patient's perspective

As Jehovah's Witness, it was crucial for me to find a medical team that respects my religious beliefs. Fortunately, I found a skilled and compassionate team that understood my needs and supported me the entire process, from consultation to surgery day.

Thanks to the expertise of my doctors, the surgery proceeded smoothly with minimal blood loss. This experience reaffirmed my belief that there are healthcare professionals who prioritize patient autonomy and religious considerations, providing me with a profound sense of relief.

Furthermore, this experience has strengthened my belief in the safety and effectiveness of alternative transfusion

treatments. I am now more confident than ever in navigating my health choices while remaining true to my religious convictions.

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### Author contributions

Q.O.L. conceptualized and wrote original draft; J.A. was part of the conceptualization; C.E.O. and C.E.I. reviewed and edited the manuscript; M.O.M. and G.B.O.O. reviewed and edited the manuscript and also provided supervision. All authors read and approved the final manuscript.

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### Ethics approval

Ethical approval to report this case was obtained from Irrua Specialist Teaching Hospital HREC (ISTH/HREC/20240903/586).

### Informed consent

Written informed consent was obtained from the patient for their anonymized information to be published in this article.

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