



## ADDRESSING PREOPERATIVE ANEMIA MAY IMPROVE SURGICAL OUTCOMES

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Managing preoperative anemia can reduce mortality risk and prevent unnecessary transfusion. In one retrospective study, 40% of non-cardiac surgery patients were anemic preoperatively and experienced a five-fold increase in 90-day postoperative mortality.<sup>1</sup> Means to address anemia without transfusion include anemia correction, minimizing blood loss and blood conservation. Limiting blood loss from laboratory testing can also help prevent anemia.<sup>2</sup>

A multidisciplinary approach can be particularly useful for patients undergoing myomectomy surgery, which can be complicated by significant blood loss (>1 L or 20% of total blood volume).<sup>3</sup>

In one case scenario, a gynecological surgeon plans to transfuse a 54-year-old woman with a history of fibroid uterus, menorrhagia, chronic anemia and nonvalvular atrial fibrillation with two units of red blood cells prior to myomectomy surgery. Her complete blood count (CBC) shows normal white blood cell count of 8.0/uL, anemia with hemoglobin of 7.5 g/dL, and hematocrit of 22% and mildly elevated platelets of 500,000/uL. Her mean corpuscular volume (MCV) is 75 fL.

As a transfusion medicine specialist with vested interest in good patient blood management (PBM) practices, I would advise the surgeon to further evaluate the patient's anemia to identify treatable common causes, such as iron, folate and vitamin B12 deficiency.<sup>4</sup> A low MCV, along with a mildly-reactive thrombocytosis, may be indicative of iron deficiency in this case.<sup>5</sup>

To treat iron deficiencies, intravenous (IV) iron therapy can be a useful therapeutic intervention, particularly now that the risk of anaphylaxis is low, with newer non-dextran-based IV iron preparations.<sup>6</sup> Erythropoietin-stimulating agents (ESA) may also be useful adjuncts to anemia therapy. Thromboembolic complications have been disputed by several studies.<sup>7,8</sup> These agents typically take 10-21 days to be effective and surgery should be scheduled accordingly.<sup>4</sup>

Cell salvage allows practitioners to recover and reinfuse shed blood. This technique allows for up to 60% to be salvaged and may reduce transfusions by 38%.<sup>4</sup> It is optimized when significant blood loss is expected,<sup>4,9</sup> such as during myomectomy. In contrast, at least one study recommended against its use in myomectomy surgery given the unpredictability of bleeding versus its cost.<sup>10</sup>

Hemostatic agents, which reduce blood loss, include tranexamic acid (TXA) and epsilon-aminocaproic

acid. TXA has gained widespread use, particularly in orthopedic and cardiovascular surgery, and trauma.<sup>4,11,12,13,14</sup> Other agents with limited evidence of benefit in myomectomy surgery include vasoconstrictors (e.g., vasopressin) and uterotonics (e.g., oxytocin).<sup>15</sup> Leiomyoma enucleation using morcellation, laser or chemical dissection with 2-mercaptoetane sulphonate has also proven to be effective.<sup>15</sup>

Hypotensive neuraxial anesthesia, a technique that induces controlled hypotension (mean arterial pressure 50-75 mm Hg), reduces postoperative wound drainage and intraoperative blood loss by up to 40% and may be an option in cases with the likelihood of significant blood loss.<sup>4,16</sup>

Medications and dietary supplements that affect coagulation should be reversed or stopped prior to procedures to minimize prolonged bleeding.<sup>17</sup> The patient in the above case scenario may indeed be on an anticoagulant medication in light of the history of nonvalvular atrial fibrillation.

Finally, for patients who do not accept blood, such as Jehovah's Witnesses, additional alternatives to manage perioperative anemia include use of coagulation factor concentrates (e.g., prothrombin complex concentrate and recombinant factor FVIIa) and possibly oxygen therapeutic agents, though not currently licensed in the U.S.

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