

## Case Report

# Diagnostic evaluation and management of obscure overt haemorrhage in a Jehovah's witness patient: a case report and review of the literature

Rahul Menon\*

Department of General Surgery, Ipswich Hospital, Ipswich, QLD, Australia

**Received:** 22 April 2024

**Revised:** 12 June 2024

**Accepted:** 20 June 2024

**\*Correspondence:**

Dr. Rahul Menon,

E-mail: [rahul.menon@health.qld.gov.au](mailto:rahul.menon@health.qld.gov.au)

**Copyright:** © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

### ABSTRACT

Metastasis of cutaneous malignancies to the small intestine is rare with only up to 4.7% found in antemortem patients. The most common presenting symptoms is obstruction or intussusception whilst obscure overt haemorrhage is rare. Acute haemorrhage progressing to hypovolaemic shock is a serious and preventable issue and can be prevented by addressing the underlying cause and with the judicious use of blood products. However, in certain populations such as Jehovah's witnesses, the administration of blood products is forbidden. In the acute surgical patient who was in acute haemorrhagic hypovolaemic shock, blood-less transfusion methods included early identification of wishes, diagnosis and treatment, intraoperative cell salvage and normovolaemic haemodilution, antifibrinolytics, intraoperative sealants, and optimal surgical technique. This report described the diagnosis and management of the case of a 62-year-old male patient who presented with severe obscure overt haemorrhage and a haemoglobin nadir of 3.7 g/dl who declined blood products. This patient had unremarkable imaging findings on CT and no embolization target despite a jejunal mass with active arterial blush. Diagnostic laparoscopy with on-table push enteroscopy identified an ulcerated jejunal lesion that was subsequently resected. Histopathological assessment of the specimen revealed a diagnosis of metastatic melanoma. The patient ultimately received palliative chemotherapy and immunotherapy. To improve early diagnosis of small-bowel metastases, a combination of imaging techniques is recommended for patients with a history of cutaneous melanoma who have obscure gastrointestinal bleeding, anaemia, and other non-specific abdominal symptoms.

**Keywords:** Obscure haemorrhage, Upper gastrointestinal surgery, Bloodless transfusion, Jehovah's witness

### INTRODUCTION

Metastasis of cutaneous malignancies to the small intestine (SI) is a rare phenomenon but is common (most commonly to ileum and jejunum) in as much as 60% of cases in post-mortem cases of malignant melanoma (MM).<sup>1,2</sup> Nevertheless, the clinical diagnosis of small intestinal melanoma malignancy in antemortem patients is only made in 2-4.7% of patients.<sup>1,2</sup> The most common presenting symptom is obstruction or intussusception whilst obscure overt haemorrhage is rare.<sup>1,2</sup>

Acute haemorrhage can manifest in a myriad of ways dependent on its mechanism and anatomic location. Whilst it is an exceedingly common cause of hypovolaemic shock, it remains to be a serious and preventable cause. In cases of severe acute anaemia, the maintenance of an adequate PO<sub>2</sub> despite the diminished capacity of blood to carry O<sub>2</sub>. Conventional strategies to restore the oxygen-carrying capability of blood are usually achieved volume resuscitation using blood products.<sup>3</sup> However, in certain populations, transfusions

of blood products cannot be administered due to patients' religious beliefs.

Over 2.2 billion people identify as the Christian faith, amounting to 31.6% of the global population and of these approximately 0.4% identify with the Jehovah's witness (JW) denomination.<sup>4,5</sup> As of 2021, 3.8% of the Australian population identify with the JW faith.<sup>5</sup> One restriction that these devotees uphold is their refusal to undergo blood transfusions. They believe that receiving a blood transfusion would result in eternal damnation.<sup>6</sup> This religious conviction makes it challenging for clinicians to adequately and successfully treat acute haemorrhagic hypovolaemic shock. It is imperative that patient autonomy and rights to religious freedom be respected and other avenues to maintain tissue PO<sub>2</sub> are explored.

In the pursuit to maintain religious freedom and patient autonomy whilst effectively treating acute haemorrhage a variety of bloodless medical and surgical protocols have been established. A multidisciplinary approach is frequently required to optimize clinical outcomes for these patients, particularly in the setting of multiple comorbidities or high-risk surgical procedures. These approaches include cell salvage, controlling and preventing ongoing bleeding, intraoperative autologous haemodilution, the selective use of fractionated blood products in accepting individuals as well as the augmentation of erythropoiesis and vitamin supplementation to name a few.<sup>7,8</sup> Both medical and surgical strategies can be beneficial in the minimisation of blood loss and the conservation of PO<sub>2</sub>; this includes low-volume microcontainers for phlebotomy, inline blood-return devices for indwelling arterial and central venous catheters, tolerating lower haemoglobin levels, discontinuing herbal supplements, and diagnosing and treating anaemia.<sup>8</sup> In the acute surgical patient who is in acute haemorrhagic hypovolaemic shock, methods include: early identification of wishes, diagnosis and treatment, intraoperative cell salvage and normovolaemic haemodilution, antifibrinolytics, intraoperative sealants, and optimal surgical technique.<sup>9</sup>

This report described the diagnosis and management of the case of a 62-year-old male patient who presented with severe obscure overt haemorrhage and a haemoglobin nadir of 3.7 g/dl who declined blood products.

## CASE REPORT

A 62-year-old male JW presented to the Emergency Department (ED), encouraged by his GP, following 3 days of tarry, black stools. He did not experience any haematemesis or haematochezia, though did experience mild abdominal pain for the preceding couple of weeks which initially prompted him to visit his GP. Preliminary bloods revealed a Hb of 8.7 g/dl which prompted his GP's referral to ED. The patient's medical and surgical histories were unremarkable. Upon arrival at ED, preliminary observations and a primary survey were

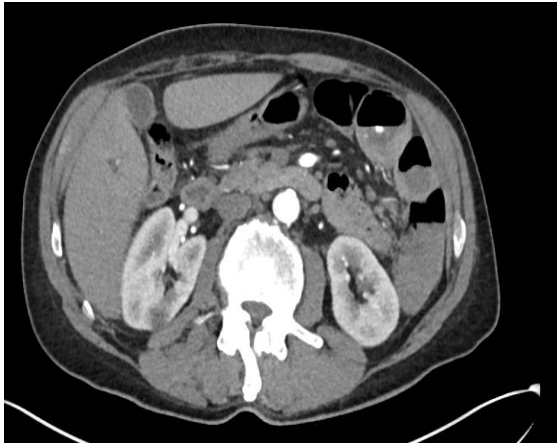
undertaken. The patient was using his own airway, with no respiratory distress and a clear chest with SpO<sub>2</sub> of 98%. His capillary refill time was slightly prolonged at 3 seconds, with a regular pulse of 86bpm in sinus rhythm and a blood pressure of 131/62 mmHg. Preliminary CT abdomen-pelvis scanning did not reveal any abnormalities.

The patient had an unremarkable medical history and apart from taking some ibuprofen for chronic back pain - which he had not been taking for over-4 months. He also did not have any upper or lower gastrointestinal symptoms, was not taking a PPI nor had he had a gastroscopy. He did have a colonoscopy 4 years ago which found some small benign polyps and he had a first-degree relative with colorectal cancer. The patient was admitted under the general surgical team with a preliminary diagnosis of a likely upper gastrointestinal bleed (UGIB) and was booked and consented for a gastroscopy which would be conducted in the morning if the patient remained stable.

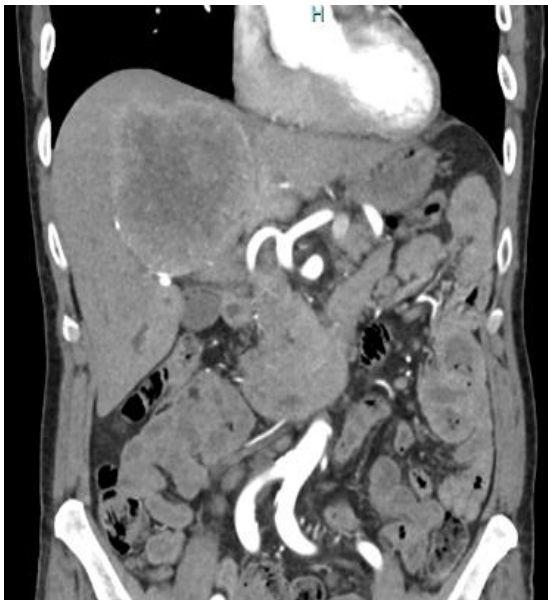
The patient was well overnight and had stable observations and unremarkable systemic examination, haemoglobin levels dropped to 7.5 g/dl with a normal MCV of 83 fl, haematocrit remained low at 0.23 l/l and coagulation studies were normal with an INR of 1.0. Of note, the patient reported a small amount of melaena overnight. Gastroscopy was performed and was reported as anatomically normal with no active bleeding, inflammation, or ulceration. The patient continued to have obscure GI bleeding and further biochemical investigations noted a haemoglobin drop to 6.2 g/dl. The decision was made to perform a CT angiogram and abdominal ultrasound (USS) which revealed a proximal jejunal bleed and a large 12 cm non-bleeding liver mass respectively. Following this, the patient had 3 large passages of melaena, and a corresponding haemoglobin drop to 4.8 g/dl, in the context of an active jejunal bleed that was initially favourable for embolization with interventional radiology, the patient was transferred to a tertiary centre with these capabilities.

Mesenteric angiogram was performed as an emergency procedure however did not reveal any areas of active bleeding, of note there was some increased vascularity in the proximal jejunum but crucially no target for embolization. Meanwhile, due to the patient's religious beliefs medical and surgical teams could not administer blood products and ensured that iron, folate, vitamin B12 and vitamin D levels were replete; 2.1 g of iron polymaltose was given intravenously along with 1000 mcg of vitamin B12 daily. Haematology was consulted and recommended an empirical loading dose of 40,000 units of recombinant human erythropoietin (rHuEPO) with a further 600 U/kg weekly or 50,000U until haemoglobin was above 9 g/dl. Despite these measures, the patient's haemoglobin continued to drop to a nadir of 3.7 g/dl. The decision was made to perform a diagnostic laparoscopy with on-table push enteroscopy to further

investigate the jejunal loop. Push-enteroscopy to 60 cm noted an ulcerated lesion of the jejunum, which was subsequently tattooed, laparoscopic assessment yielded a large mesenteric mass approximately 10 cm proximal to tattoo (15 cm from duodenojejunal flexure) which was hypervascular and bleeding. The mesenteric mass and ulcerated jejunum was dissected from their fusion plate to the transverse mesocolon and surgically stapled with a Medtronic Endo GIA curved tip 45 stapling device in a side-to-side anastomosis and subsequently oversewed with 3/0 V-loc sutures. The patient was subsequently surgically closed in the normal fashion.



**Figure 1: CT angiogram arterial phase with arterial blush visualised in jejunum.**



**Figure 2: CT angiogram showing large liver metastasis.**

Histopathological assessment of the specimen revealed a diagnosis of metastatic melanoma. Due to the cessation of acute obscure bleeding, the patient’s haemoglobin began to increment over the coming days supported by rHuEPO and other supportive measures.

**Table 1: Gastrointestinal Bleeding definitions (adapted from the American Gastroenterological Association).<sup>10</sup>**

Terms	Definitions
<b>Overt or visible bleeding</b>	GI bleeding manifesting as visible bright red or altered blood in emesis or faeces
<b>Occult bleeding</b>	Initial presentation of IDA and/or positive FOBT; no visible blood in faeces
<b>Obscure bleeding</b>	Recurrent or persistent IDA, positive FOBT, or visible bleeding with no bleeding source found at original endoscopy
<b>Obscure-occult bleeding</b>	Subcategory of obscure bleeding characterised by recurrent or persistent IDA and/or positive FOBT with no source found at original endoscopy; no visible blood in faeces
<b>Obscure-overt bleeding</b>	Subcategory of obscure bleeding characterised by recurrent or persistent overt/visible bleeding with no source found at original endoscopy; bleeding manifest as visible blood in emesis or faeces

**DISCUSSION**

This was a unique clinical case of obscure-overt hypovolaemic haemorrhagic shock that was successfully managed without the administration of blood products. Successful management required multidisciplinary input between medical and surgical teams as well as the administration of an appropriate bloodless transfusion protocol.

Obscure-overt bleeding is a sub-category of obscure bleeding characterised by visible or persistent bleeding with no source found at original endoscopy, with bleeding manifest as blood in emesis or faeces.<sup>10</sup> Although the extant literature had identified that up to 30-50% of occult bleeding cases will not have a source identified during endoscopy, these patients rarely evolve into obscure bleeding.<sup>11</sup>

Acute haemorrhage causes loss of blood volume leading to hypovolemia, hypoperfusion, and hypoxemia with hypoxia. The recognition and quantification of blood loss via history, examination and correlation with the patient’s biochemistry is key to making a prompt and evidence-based diagnosis. The American College of Surgeons Advanced Trauma Life Support (ATLS) haemorrhagic shock classification links the amount of blood loss to expected physiologic responses in a healthy 70 kg patient. Classes 1 and 2 (up to a 30% loss of total blood volume) can be sufficiently mitigated by the body’s own compensatory mechanisms but beyond this, compensatory mechanisms are insufficient.<sup>12</sup> Although

there is a paucity of data on what exactly the level of blood haemoglobin (bHb), where tissue oxygenation becomes 'supply dependent', studies indicate that this is between a bHb level of 4-4.5 g/dl and perhaps when aggressive medical management should be considered.<sup>12</sup>

The primary goal in acutely bleeding patient is to maintain adequate intravascular volume whilst not compromising oxygen delivery (DO<sub>2</sub>) represented by the amount of oxygen transported to tissues and is defined as the product of cardiac output (CO) and oxygen content. DO<sub>2</sub> can be increased or maintained by increasing cardiac output, improving oxygenation or haemoglobin and is acutely optimised by the maintenance of blood volume by crystalloid or colloid solutions and supplemental oxygen. Nevertheless, these methods may be insufficient and have diminishing returns due to rapid distribution into the interstitial space, reduction of net oxygen carrying molecules through haemodilution or through deleterious effects to the haemostatic system.<sup>13</sup> Early administration of blood products is vital to correct coagulopathy, minimise haemodilution, preserve oxygen-carrying capacity and repair the endothelium (through preventing thrombocytopenia).<sup>13</sup> Unfortunately, for JW's the administration of blood products is unacceptable. Therefore, the management of acute haemorrhage and anaemia become challenging and involves prompt identification and anatomical location of blood loss, reducing haemorrhage, enhancing erythropoiesis, optimising DO<sub>2</sub>, reducing consumption and preventing haemodilution and iatrogenic anaemia.<sup>13</sup> We presented and analysed these strategies in the management of this case.

### **Identification and diagnosis**

Amongst patient who are diagnosed with a cutaneous melanoma, approximately 60% have a gastrointestinal metastasis which is rarely diagnosed throughout the patient's lifetime.<sup>1,2</sup> Clinical signs and symptoms include abdominal pain, intestinal obstruction, constipation, hematemesis, melena, anaemia, fatigue, weight loss, and the presence of a palpable abdominal mass.<sup>2</sup> The time interval between the diagnosis of primary malignant melanoma and the diagnosis of metastatic intestinal melanoma is variable ranging from 2-180 months.<sup>2</sup> In this case, vague symptoms of abdominal pain, melaena and anaemia were present but due to the challenging nature of obscure overt bleeding, localisation was not initially possible.

Diagnosis of SI manifestations of MM are challenging with enteroclysis being the mainstay, CT is a common initial modality but only has a sensitivity of around 60%, largely due to the complexity of the scans and the unpredictability in tumour growth pattern.<sup>2</sup> Conventional barium studies are useful in examining luminal changes but crucially cannot appreciate extraintestinal metastasis.<sup>15</sup> CT enhanced enteroclysis improves the detection rate of GI MM allowing examination of both

luminal and extraluminal changes with the added advantage of diagnosing those with intussusception and obstruction-a common acute presentation.<sup>1,2</sup> Endoscopic evaluation is a readily available, non-invasive and useful procedure in GI tumour detection, though, as this case demonstrates, jejunal and ileal segments are not easily examined so limits the sensitive detection of tumours.<sup>2</sup> Nuclear imaging studies, like PET scanning demonstrate enhanced sensitivity than CT but due to its reservation to specialised institutes, limits its pervasiveness and availability. Surgical intervention with diagnostic laparoscopy is seldom used as a diagnostic modality in GI MM as accurate preoperative planning is paramount, but is commonly used in confirmed diagnoses.<sup>2</sup>

Modalities in the identification of obscure overt GI bleeding (OOGIB) are largely dependent on availability, centre expertise, patient preference as well as costs and risks in management. Push enteroscopy (PE) permits evaluation of the oesophagus, stomach, and duodenum, as well as the proximal jejunum, to approximately 50–100 cm beyond the ligament of Treitz.<sup>14</sup> It had a reported diagnostic yield of 3-70%, but allowed greater visualisation of small bowel (SB) pathology without repeating endoscopy and may account for lesions missed on initial endoscopy.<sup>14</sup>

Capsule endoscopy (CE) has revolutionised SB imaging and is highly sensitive, high negative predictive value (80-100%) for diagnosing OOGIB. The extant literature notes a diagnostic yield of 58.4-86.8%, Pennazio et al report that CE has a higher diagnostic yield during OOGIB with diminishing returns with previous OOGIB.<sup>15</sup> Double-balloon enteroscopy (DBE) has the highest diagnostic yield and treatment success in OOGIB of up to 60-80% and allows entire SB visualisation as well as interventional advantages.<sup>15</sup> Albert et al has created an algorithm for the detection of SB MM who were screened for haemorrhage.<sup>15</sup> The authors reported the highest rates of MM detection with CE and the most effective investigation modality with gastroscopy and colonoscopy not detecting any further MM lesions.<sup>15</sup>

### **Management of acute obscure haemorrhage in JWs**

Managing acute haemorrhage in JWs, especially when the anatomical location is unknown can be a challenging endeavour. A multidisciplinary approach should be employed for any complex treatment decisions in JW patients in conjunction with an appropriate bloodless management protocol, further, transfer to a centre with greater expertise should be prioritised if possible.<sup>16</sup>

Optimisation of oxygen delivery, judicious use of crystalloid/colloid fluid resuscitation are key in avoiding haemodilution and tissue hypoxia.<sup>16</sup> Unwell patients often require frequent and close biochemical monitoring; though for JW patients, effort must be taken in rationalising the frequency and volume of blood sampling. In this case, low-volume paediatric phlebotomy

tubes were employed along with judicious use of only essential testing. Paediatric tubes as well as monitoring with blood gases could be alternatives.<sup>16</sup>

In surgery, the advent of cell saver devices harvests red cells shed during surgery, processes and prepares for safe return as a method of autologous transfusion during surgery.<sup>17</sup> During our case, we employed the use of a cell salvage device throughout surgery to preserve the already low haemoglobin nadir that we started with. Although it preserves the oxygen delivery capacity of circulating red blood cells, it is devoid plasma, clotting factors and platelets resulting in a dilutional coagulopathy.<sup>18</sup> Several newer electrocautery modalities have been demonstrated to reduce blood loss with novel radiofrequency or ultrasonic sealant.<sup>18</sup> In this case, the use of motorised staple devices was used along with ultrasonic cautery devices. The causes of anaemia must be constantly interrogated including folate, B12, iron and vitamin D levels. For patients with anaemia and iron deficiency, oral iron is recommended if patients were tolerating oral intake (or through a gastric or nasogastric tube when appropriate). Little evidence supports the use of intravenous iron but it may be appropriate perioperatively or when oral iron is not tolerated or if traditional gastrointestinal absorption is impaired.<sup>16</sup>

Corwin et al have demonstrated that rHuEPO can reduce transfusion requirements and improve haemoglobin, nevertheless, the long term management strategy with rHuEpo has not been studied extensively in JW patients.<sup>17</sup> A clinical trial conducted by Atabek et al demonstrated that rHuEPO administered 300 U/kg IV 3 times/week for 1 week followed by 150 U/kg 3 times/week increases haematocrit compared to placebo.<sup>18</sup> Therefore, based on the extant literature, it is acceptable to administer a rHuEPO regimen if JW patients are critically anaemic or at risk of major blood loss perioperatively. It is important to note however, all studies investigating rHuEPO have ensured that patients have adequate levels of vitamin B12, iron and folate for this therapy to be effective.<sup>16</sup> Furthermore, appreciable rises in haemoglobin takes at least 5 days after the administration of rHuEPO.<sup>16</sup>

Pulsed hyperbaric oxygen (HBO) has a sound physiological rationale to support the alleviation of oxygen debt, but there is little evidence demonstrating improvements in haemoglobin levels.<sup>16,19,29</sup> However, the availability of HBO and the practicality in treating critically ill patients remains a challenge and therefore can be considered an adjunct in treating severe anaemia when other measures have failed. Artificial oxygen carriers (AOCs) are synthetic solutions with the ability to bind, transport, and unload oxygen in the body. They have been heralded as the future in bloodless medicine, however phase III trials did not show any benefits in reduction of RBC transfusion or 28-day mortality. Furthermore, JW patients are unlikely to accept these products as they are traditionally from human or bovine sources.

## CONCLUSION

To improve early diagnosis of small-bowel metastases, a combination of imaging techniques is recommended for patients with a history of cutaneous melanoma who have obscure gastrointestinal bleeding, anaemia, and other non-specific abdominal symptoms.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: Not required*

## REFERENCES

1. Panagiotou I, Brountzos EN, Bafaloukos D, Stoupis C, Brestas P, Kelekis DA. Malignant melanoma metastatic to the gastrointestinal tract. *Melanoma Res.* 2002;12(2):169-73.
2. Schuchter LM, Green R, Fraker D. Primary and metastatic diseases in malignant melanoma of the gastrointestinal tract. *Curr Opin Oncol.* 2000;12(2):181-5.
3. Nunez TC, Cotton BA. Transfusion therapy in hemorrhagic shock. *Curr Opin Crit Care.* 2009;15(6):536-41.
4. Pew Research Center. Share of global population affiliated with major religious groups 2022. Pew Res Center. 2023.
5. Watch Tower Bible and Tract Society of Pennsylvania. Service Year Report of Jehovah's Witnesses Worldwide 2023. Available at: <https://www.jw.org/en/jehovahs-witnesses/faq/how-many-jw/>. Accessed on 1 April 2024.
6. Thompson HA. Blood transfusions and Jehovah's Witnesses. *Tex Med.* 1989;85(4):57-9.
7. Frank SM, Wick EC, Dezern AE, Ness PM, Wasey JO, Pippa AC, et al. Risk-adjusted clinical outcomes in patients enrolled in a bloodless program. *Transfusion (Paris).* 2014;54:2668-77.
8. Resar LMS, Wick EC, Almasri TN, Dackiw EA, Ness PM, Frank SM. Bloodless medicine: current strategies and emerging treatment paradigms. *Transfusion (Paris).* 2016;56(10):2637-47.
9. Resar LMS, Frank SM. Bloodless medicine: what to do when you can't transfuse. *Hematology.* 2014;2014(1):553-8.
10. Zuckerman GR, Prakash C, Askin MP, Lewis BS. AGA technical review on the evaluation and management of occult and obscure gastrointestinal bleeding. *Gastroenterology.* 2000;118(1):201-21.
11. Rockey DC, Cello JP. Evaluation of the gastrointestinal tract in patients with iron-deficiency anemia. *N Engl J Med.* 1993;329(23):1691-5.
12. Lieberman JA, Weiskopf RB, Kelley SD, Feiner J, Noorani M, Leung J, et al. Critical oxygen delivery in conscious humans is less than 7.3 ml O<sub>2</sub> x kg(-1) x min(-1). *Anesthesiology.* 2000;92(2):407-13.
13. Jensen FB. The dual roles of red blood cells in tissue oxygen delivery: oxygen carriers and

- regulators of local blood flow. *J Exp Biol.* 2009;212(21):3387-93.
14. Raju GS, Gerson L, Das A, Lewis B. American Gastroenterological Association (AGA) Institute technical review on obscure gastrointestinal bleeding. *Gastroenterology.* 2007;133(5):1697-717.
  15. Estévez E, González-Conde B, Vázquez-Iglesias JL, Vázquez-Millán M, Pértega S, Alonso PA, et al. Diagnostic yield and clinical outcomes after capsule endoscopy in 100 consecutive patients with obscure gastrointestinal bleeding. *Eur J Gastroenterol Hepatol.* 2006;18(8):881-8.
  16. MacLaren G, Anderson M. Bloodless intensive care: a case series and review of Jehovah's Witnesses in ICU. *Anaesth Intensive Care.* 2004;32(6):798-803.
  17. Atabek U, Alvarez R, Pello MJ, Alexander JB, Camishion RC, Curry C, et al. Erythropoietin accelerates hematocrit recovery in post-surgical anemia. *Am Surg.* 1995;61(1):74-7.
  18. McLoughlin PL, Cope TM, Harrison JC. Hyperbaric oxygen therapy in the management of severe acute anaemia in a Jehovah's witness. *Anaesthesia.* 1999;54(9):891-5.
  19. McLoughlin P.L. Hyperbaric oxygen therapy in the management of severe acute anaemia in a Jehovah's witness. *Anaesthesia.* 1999;54(9):891-5.

**Cite this article as:** Menon R. Diagnostic evaluation and management of obscure overt haemorrhage in a Jehovah's witness patient: a case report and review of the literature. *Int Surg J* 2024;11:1141-6.