

SHORT REPORT

Transfusion requirements in elective open abdominal aortic aneurysm repair: a network review of practice

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Plain English Summary

Why we undertook this work: When there is a shortage of blood for transfusion the NHS recommends that surgery likely to require blood transfusion should be postponed. Open surgery for a dilated artery (aortic aneurysm) in the abdomen is traditionally considered likely to require blood transfusion and thus affected by these recommendations.

What we did: We reviewed 3 years of data from patients undergoing open surgery to repair aortic aneurysms in order to assess how many required blood transfusion.

What we found: Only seven of 90 patients (7.8%) undergoing open aortic aneurysm surgery needed a transfusion.

What this means: The transfusion rate following open aortic aneurysm surgery is much lower than the 15% risk limit suggested for postponing surgery in the current NHS guidelines when blood stocks are low. Therefore, in such circumstances, open aortic aneurysm surgery should continue.

Key words: transfusion, abdominal aortic aneurysm, elective open surgery

Abstract

Introduction: Patients undergoing elective open abdominal aortic aneurysm (AAA) repair are considered a high-risk group for transfusion, with transfusion rates quoted around 15%. In the context of an NHS blood transfusion (NHSBT) Amber Alert, it is suggested that surgeries with a high risk of transfusion (>15%) are postponed unless otherwise clinically indicated. This review of network elective open AAA activity aimed to improve our understanding of transfusion requirements and risk profile.

Methods: National Vascular Registry data for patients undergoing elective open AAA repair in the Dorset and Wiltshire Vascular Network (DWWN) between January 2019 and February 2022 inclusive were retrospectively reviewed and cross-referenced with electronic patient records, pathology results, transfusion database and theatre records.

Results: Ninety patients (seven women and 83 men) undergoing elective open AAA repair were identified. Seven (7.8%) patients required a postoperative transfusion.

Conclusion: This contemporary review suggests elective open AAA repair should continue during

an NHSBT amber alert as the risk of transfusion is lower than previously reported.

Background

During a recent NHS blood transfusion (NHSBT) Amber Alert¹ for a shortage of Group O red cells available for transfusion, a recommendation to review higher risk surgeries which may require transfusion was implemented. Vascular surgery, and particularly open abdominal aortic aneurysm (AAA) repair, is often cited as being a particularly high-risk group (>15% transfusion requirement); however, specific data on transfusion requirements are largely lacking in contemporaneous UK practice. Previous studies have suggested a packed red blood cell (PRBC) transfusion requirement in 46-48.9% of patients undergoing open AAA repair.^{2,3} We undertook a retrospective review of our elective open AAA cases, with an aim to better understand transfusion requirements and risk profile.

Method

All elective open AAA repair cases from Dorset and Wiltshire Vascular Network (DWWN) between January 2019 and February 2022 inclusive

Table 1 Patient characteristics for those requiring PRBC transfusion.

Patient no	Age (years)	Type of repair	Preoperative Hb (g/L)	PRBC requirement	Transfusion timing (POD)	Complication	Mortality
1	69.3	Tube graft	103	1	3	–	–
2	72.0	Aorto-bi-iliac	138	3	2	POD 2 Limb bleed = EVAR	–
3	70.8	Aorto-bi-iliac	118	3	4, 7, 9	POD 2 Left colon ischaemia = Hartmanns POD 8 HIT	POD 9
4	84.7	Tube graft	127	1	3	–	–
5	75.1	Tube graft	130	1	3	–	–
6	59.5	Tube graft	143	3	2, 2, 3	POD 3 Dehiscence	–
7	75.6	Aorto-bi-femoral	115	2	5	–	–

Hb, haemoglobin; PRBC, packed red blood cells; POD, postoperative day; EVAR, endovascular aneurysm repair; HIT, heparin-induced thrombocytopenia.

submitted to the National Vascular Registry were retrospectively reviewed. Data were cross-referenced with electronic patient records, pathology results, transfusion database and theatre records.

Results

Ninety cases were identified, all with complete data sets available. All cases were performed as per the DWVN protocol within a designated vascular operating theatre with intraoperative cell salvage autologous transfusion in use for all cases. All cases were performed or supervised scrubbed by a Consultant Vascular Surgeon.

Seven female and 83 male patients were analysed with median (IQR) ages of 70.6 (65–74) years and 72.0 (68–76) years, respectively. The median AAA size was 59 and 56 mm for female and male patients respectively. The average length of stay following elective open repair during this period was 9 days (range 6–10) with a risk adjusted 30-day elective AAA repair survival of 99.4%.⁴

In total, seven patients received a PRBC transfusion (7.8%), all of which occurred in the postoperative phase of care. Table 1 outlines their characteristics.

A total of 14 PRBC units were transfused after appropriately triggering the local transfusion protocol of haemoglobin <80 g/L (mean 0.16 units/case). Three of these PRBC transfusions were single unit, one was two units and three were three units. Notably, all three patients receiving three units of transfusion required a return to theatre in the postoperative period for a complication. The median preoperative haemoglobin was 128.5 g/L (range 103–143 g/L) in this group (vs 130.1 g/L, NSD).

During the study period, the availability and use of intravenous iron in the postoperative care of vascular patients became more common with agreed standard operating procedures in place. This is considered likely to have positively impacted the transfusion requirements in this patient cohort and should also be considered alongside these data.

KEY MESSAGES

- PRBC transfusion was required in only 7.8% of open AAA repairs.
- Overall PRBC transfusion requirements were 0.16 units per case.
- In the context of an NHSBT Amber Alert, elective open AAA repairs should be permitted to be performed alongside contemporary practice: preoperative optimisation of haemoglobin, use of intraoperative cell salvage autologous transfusion and postoperative availability of intravenous iron.

Conclusion

The requirement for PRBC transfusion following elective open infrarenal AAA in our network was 7.8%. This is well below the perceived and historic transfusion requirements in this group of patients. In the context of contemporary practice, our data would support such cases continue to be delivered during times of blood shortages.

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