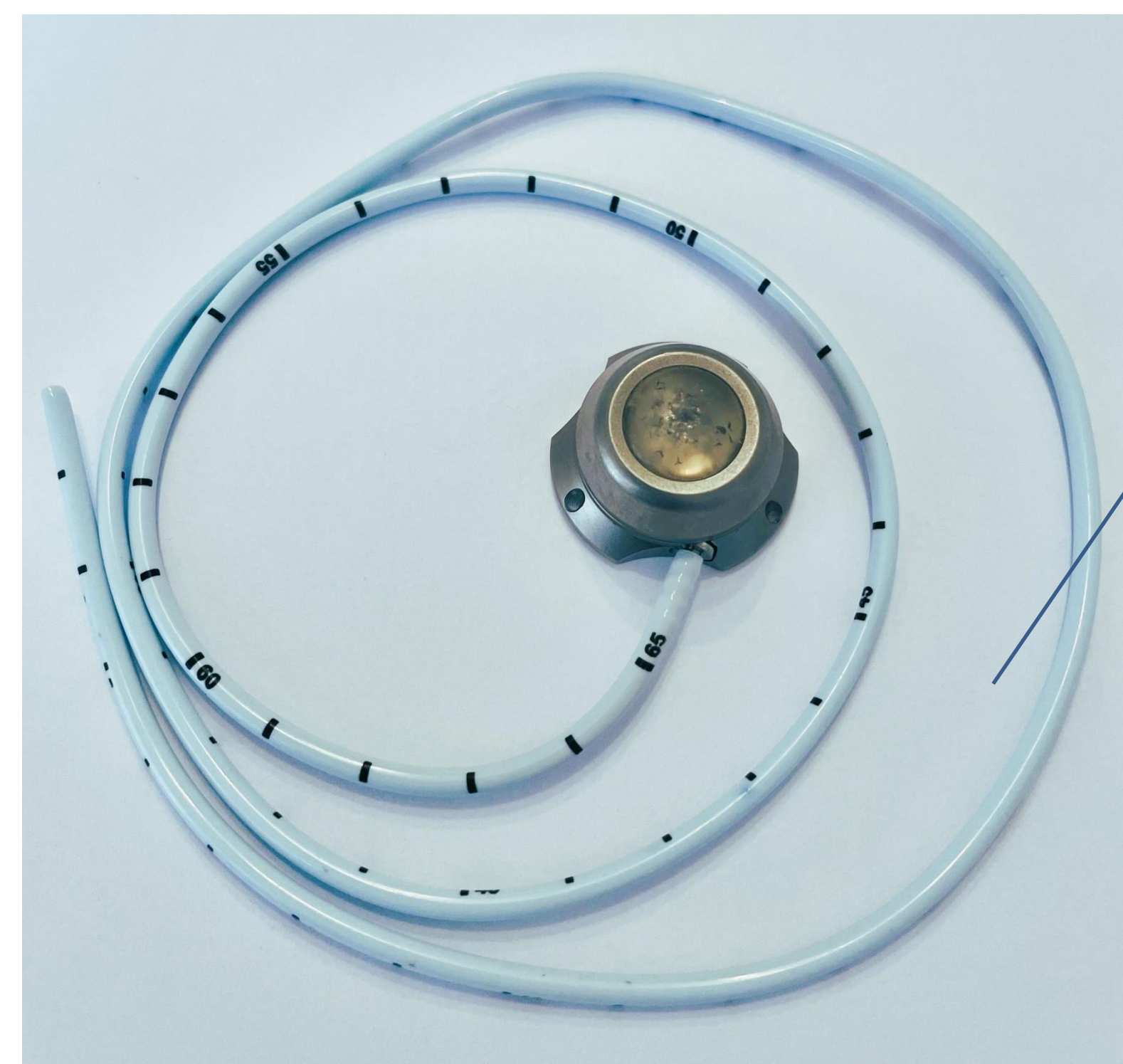


Vortex Ports for Red Cell Exchange in Children with Sickle Cell Disease

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Introduction

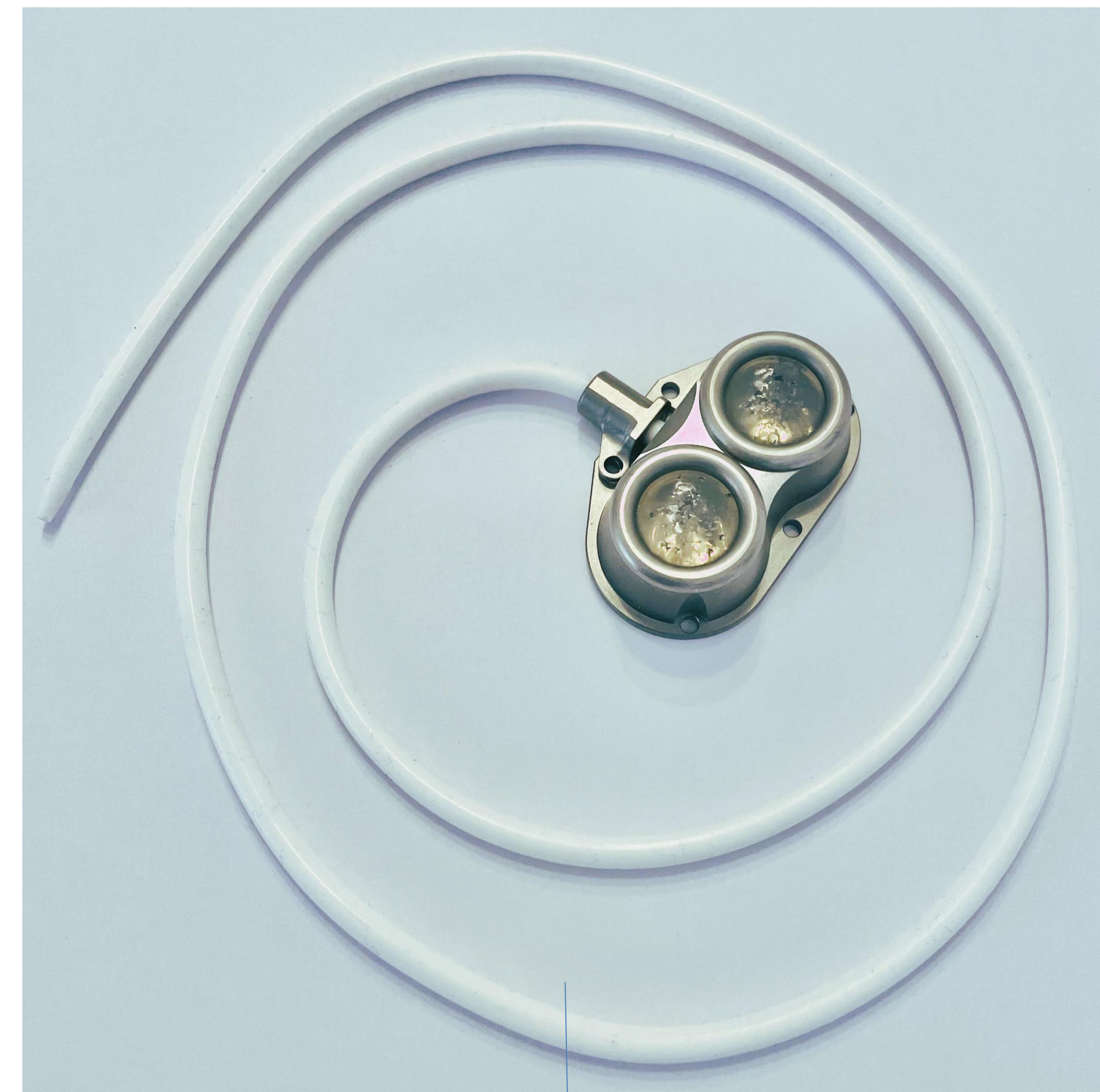
Automated red cell exchange (RCEX) for sickle cell disease (SCD) has advantages over manual red cell exchange: it reduces % HbS faster, limits iron accumulation and its effectiveness allows up to 6-weekly transfusion intervals. However, the requirement for repeated venous access can be problematic in the paediatric population. Often peripheral flow rates are not sufficient for blood draw despite being adequate for return. In children with difficult access, we inserted single and double lumen Vortex® ports (AngioDynamics, USA) for chronic automated RCEX based on weight. Those that were under 40kg received single lumen ports and those over received double lumen devices.



Single lumen
port

Methods

A retrospective review of operative notes, electronic patient records and NHS Blood Transfusion procedure records at Royal Manchester Children's Hospital was performed. Patients were followed from 1 to 16 exchange procedures over a period of 5 to 22 months. These were carried out between 2019 and 2021.



Double lumen
port

Results

A total of 8 patients with SCD underwent 108 RCEX procedures. The number of single verses double port insertion was evenly split. The mean age of child was 14.7 (range: 9 to 18 years). Of the 8 children, 6 still have devices in situ with a mean dwell time of 21.4 months (range: 17 to 26 months). Only one port was removed secondary to occlusion and this patient subsequently required an external double lumen central venous catheter to facilitate bone marrow transplant. The second patient was transferred to adults for on going management of their SCD. The infection rate was 0%. Four out of the 108 procedures performed were abandoned secondary to pyrexia, low HBs levels and an inability to gain peripheral access.



Conclusion

Single and double lumen vortex ports are an effective and viable option for children with SCD undergoing chronic RCEX. Double lumen ports are advantageous as they negate the requirement to gain additional peripheral access during the RCEX, however these can only be sited in children over 40kg due to the size of the device. These ports are aesthetically favourable and pose less restriction on bathing and swimming when compared to tunnelled central venous catheters. Our experience suggests that they have low complication rates and are an effective method for RCEX in children.

References:

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2. Shrestha A, Jawa Z, Koch KL, Rankin AB, Xiang Q, Padmanabhan A, Karafin MS, Field JJ. Use of a dual lumen port for automated red cell exchange in adults with sickle cell disease. J Clin Apher. 2015 Dec;30(6):353-8.

High flow 16G non-coring
needle inserted into port