Oxygenated blood from central venous catheter: A case of missed partial anomalous pulmonary venous connection

Madam,

Partial anomalous pulmonary venous connection (PAPVC) is a rare congenital disorder with a reported incidence of 0.4–0.7% which is usually associated with Atrial Septal Defect (ASD) in 80–90% cases and the diagnosis can be difficult to make in routine transthoracic echocardiography.[1] Here, we report a case of PAPVC which was missed initially in a follow-up case of atrial septal defect with mitral stenosis patient who was taken up for mitral valve replacement, and after insertion of central venous catheter, there was aspiration of oxygenated blood from the catheter tip causing confusion of arterial migration of central venous catheter. The oxygenated blood was later found to be due to the presence of catheter tip near the drainage point of anomalous pulmonary vein into the superior vena cava (SVC).

A 35-year-old female follow-up patient of ASD closure presented to our center with history of breathlessness with palpitations for 1 year. She had previous history of ASD closure in 1993, balloon mitral valvotomy in 1997, and percutaneous transvenous mitral commissurotomy in 2016. Her current echocardiography report

suggested severe mitral stenosis with severe tricuspid regurgitation, left atrial clot, and increased right ventricular systolic pressure; ECG showed Atrial Fibrillation (AF) with ventricular heart rate of 100/min. Other investigations were unremarkable and patient was posted for elective mitral valve replacement.

In the operating room, induction was started as per institutional protocol after connecting cardiac monitors; central venous catheterization of right internal jugular vein was done under ultrasound guidance with 7F Triple lumen catheter which was inserted till 11 cm, while initial flushing of the catheter blood aspiration was bright red in color from the proximal port of central line but dark from other two ports. Blood gas analysis was done with samples from all ports which showed a higher pO_2 of 141 mmHg in proximal port and lower pO_2 of around 40 mmHg in other ports causing confusion with arterial migration of catheter; however, pressure tracings in all ports were suggestive of venous placement. Initially, a suspicion of residual ASD with catheter tip in left atrium was made and to confirm this transesophageal echocardiography was done which failed to show any residual defect, and central venous catheter tip was found to be SVC along with a right pulmonary vein draining into the SVC which was also later confirmed visually by the surgeon.

PAPVC is a rare congenital cardiac disorder with a reported incidence of 0.4–0.7%.[1-3] In this condition, one or more but not all of the pulmonary veins drain either into systemic veins or the right atrium. Clinical presentation of PAPVC may vary from asymptomatic to that of right-sided volume overload depending upon the number of veins draining to systemic side of circulation and the presence of shunt.[4,5] Preoperative diagnosis of isolated Partial anomalous pulmonary venous return (PAPVR) may be difficult because of lung overlying the pulmonary veins and the SVC, where there is doubt that magnetic resonance imaging is useful in diagnosing PAPVC.[4] In this case, the diagnosis was completely missed initially and when central venous catheter was introduced, the catheter tip was falling just along the drainage of the pulmonary vein into the SVC which caused the aspirate from line to be bright red in color with high pO_2 while the distal ports of the catheter which were lying before the insertion point of the anomalous pulmonary vein were draining deoxygenated blood causing a confusion in placement of the central venous catheter. The diagnosis was finally made with the help of transesophageal echocardiography.

Finally, we would like to conclude that PAPVC can be easily missed even after echocardiography if the index of suspicion is not very high and it may lead to further confusion for the anesthetist if the tip of catheter lies distal to the drainage point of anomalous pulmonary vein into the systemic vein due to misreading of venous blood as arterial.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

Udismita Baruah, Mahesh Chandra, Sushil Guria, Virendra Kumar, A. R. Gogia

Department of Anaesthesiology, VMMC and Safdarjung Hospital, New Delhi, India

Address for correspondence: Dr. Mahesh Chandra, Department of Anaesthesiology, VMMC and Safdarjung Hospital, New Delhi - 110 029, India.
E-mail: maheshhchandra@yahoo.in

References

1. Hughes C, Rumore P. Anomalous pulmonary veins. Arch Pathol 1944;37:364-6.
2. Healey JE Jr. An anatomic survey of anomalous pulmonary veins: Their clinical significance. J Thorac Surg 1952;23:433-44.
3. Broy C, Bennett S. Partial anomalous pulmonary venous return. Mil Med 2008;173:523-4.
4. White CS, Baffa JM, Haney PJ, Pace ME, Campbell AB. MR imaging of congenital anomalies of the thoracic veins. Radiographics 1997;17:595-608.
5. Bernstein D. Partial anomalous pulmonary venous return. In: Kliegman RM, Behrman RE, Jenson HB, Stanton BF, editors. Nelson Textbook of Pediatrics. 18th ed. Philadelphia: Saunders; 2007. p. 1886.

Access this article online	
Quick Response Code:	Website: www.joacp.org
	DOI: 10.4103/joacp.JOACP_41_18

How to cite this article: Baruah U, Chandra M, Guria S, Kumar V, Gogia AR. Oxygenated blood from central venous catheter: A case of missed partial anomalous pulmonary venous connection. J Anaesthesiol Clin Pharmacol 2019;35:274-5.