

Hematuria in a child eight hours, postcardiac surgery

The Editor,

An 1-year-old female child (weight 6 kg; length 65 cm) was admitted to our center with a diagnosis of congenital cyanotic heart disease having double outlet right ventricle, malaligned perimembranous ventricular septal defect (VSD), large aortopulmonary (AP) window and a patent foramen ovale. She had an aortomitral discontinuity, normal biventricular function and severe pulmonary artery hypertension. She underwent an intracardiac repair (Dacron patch VSD closure), conduit placement (monocusp aortic homograft) for right ventricular outflow tract and AP window closure with gortex patch with the aid of cardiopulmonary bypass (CPB). Thereafter, the child was shifted to intensive care unit (ICU) on intravenous dobutamine 5 mcg/kg/min and nitroglycerine 2 mcg/kg/min. The child was mechanically ventilated and observed for any postoperative bleeding for next 6 h. During this period, the hemodynamics remained stable, urine output was more than 1 ml/kg/h, peripheral temperature increased up to 35°C and mediastinal chest tube drainage was only 20 ml. Therefore, weaning from mechanical ventilation was planned, and the child was allowed to awaken. Two hours later, the child developed hematuria, and the weaning was postponed. The child was observed for next 4 h but the hematuria did not subside and the hemoglobin decreased from 15 g% to 12.6 g%. The child did not receive any blood transfusion in the ICU during this period. A transthoracic echocardiogram was performed, which revealed normal biventricular function, no pulmonary regurgitation or residual VSD and mild aortic regurgitation (AR). The AR jet was eccentric and hitting the VSD patch Figure 1, Video 1. Still the appearance of

hematuria 8 h after was not explainable. Therefore the hemodynamics were evaluated retrospectively Table 1 and it was observed that at the beginning of weaning period the systemic and diastolic blood pressures were high (126/62 and 118/56 mm Hg) and thus the AR fraction must have increased causing more hemolysis. Furthermore, the pressures did not significantly decrease even after sedating and paralyzing the patient. Once this was realized, injection dobutamine was stopped, and enalapril 1 mg was given through the nasogastric tube to lower the pressure. Two hours later, the systemic pressure decreased to 87/40 mm Hg and the hematuria stopped with gradual clearing of the urine. The child was extubated afterward with no other complications.

Hematuria in early postoperative period has been associated with CPB,^[1] high hematocrit, prosthetic valve implantation,^[2] mismatched blood transfusion, acute kidney injury^[3] and iatrogenic trauma during urinary catheter insertion. Frequently, the hematuria begins in the operating room and continues in the postoperative period, especially if it is secondary to CPB, high hematocrit or prosthetic valve implantation. A history of blood transfusion usually precedes a blood transfusion reaction. However, development of hematuria 8 h after surgery is rare. In our patient, the hematuria developed once she was allowed to awaken, and systemic blood pressure increased. During this period, the diastolic pressure and cardiac output both increased leading to increased AR. This increased regurgitant fraction of blood kept on hitting the Dacron VSD patch thereby leading to hemolysis. Once the dobutamine was stopped and enalapril was administered the blood pressure (especially diastolic), and cardiac output decreased. Therefore,

Table 1: Systolic blood pressure and hemoglobin at different time points

	Heart rate (/min)	Blood pressure (mm Hg)	Central venous pressure (mm Hg)	Hemoglobin (g%)
Immediate postoperative	166	75/42	8	14.8
6 h	146	90/50	9	16.0
8 h	126	126/62	10	15.4
12 h	129	118/56	8	12.6
14 h	137	87/40	7	10.8

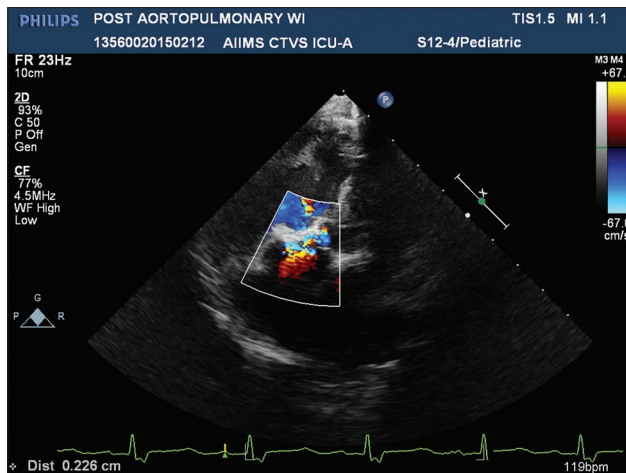


Figure 1: Transthoracic echocardiographic image showing aortic regurgitation jet hitting the Dacron patch used for ventricular septal defect closure

regurgitant blood flow decreased, and the hemolysis subsided. In conclusion, cardiac evaluation is required

in children who develop hematuria, after an initial asymptomatic period, postcardiac surgery.

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REFERENCES

1. Vercaemst L. Hemolysis in cardiac surgery patients undergoing cardiopulmonary bypass: A review in search of a treatment algorithm. *J Extra Corpor Technol* 2008;40:257-67.
2. Lander EB. Severe hemoglobinuria masquerading as gross hematuria following mitral valve replacement. *J Urol* 1995;153:1639-40.
3. Han SS, Ahn SY, Ryu J, Baek SH, Chin HJ, Na KY, *et al.* Proteinuria and hematuria are associated with acute kidney injury and mortality in critically ill patients: A retrospective observational study. *BMC Nephrol* 2014;15:93.

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