

Crochetage Sign: An Invaluable Independent ECG Sign in Detecting ASD

Anuj Sarma 

ABSTRACT

Bedside diagnosis of congenital heart disease is sometimes very difficult in patient presenting with respiratory distress in intensive care unit. However, an ECG can provide abundant information regarding its presence and its management. A 25-year-old female presented with sudden onset of respiratory difficulty and shortness of breath, following delivery one day back. Echocardiography could not be done as a poor echo window was obtained and patient could not lie down supine. However, ECG revealed right axis deviation, RBBB, and notching in the apex of the R wave in inferior leads 2,3,aVF (crochetage sign). This is directed to the presence of ASD, which was confirmed with echocardiography after stabilization of patient. We would like to illustrate the importance of simple bedside ECG finding of crochetage sign in the diagnosis of ASD when echocardiography is not possible or available in underdeveloped countries.

Keywords: ASD, Congenital heart disease, Crochetage sign, ECG, ICU, Respiratory distress.

Indian Journal of Critical Care Medicine (2021): 10.5005/jp-journals-10071-23731

CASE DESCRIPTION

A 25-year-old lady presented to the hospital with sudden onset of difficulty in breathing and palpitation, following spontaneous delivery outside one day back. There was no history of hypertension, diabetes, anemia, and fever, during the entire pregnancy period. The patient arrived in severe respiratory distress, with sweating and shallow breathing, and was immediately shifted to ICU. On examination, the patient was having tachypnea (RR-40/m), tachycardia (HR-130/m), BP (140/100 mm Hg), and bilateral basal crepitations. Cardiac auscultation findings were difficult to interpret as patient was uncooperative and restless. SPO₂ was 84% in room air. Routine examination of blood, liver, and renal function test was normal. ABG showed hypoxemia, Nt-pro-BNP was mildly raised, and D-dimer was normal. The initial differential that was kept was that of fluid overload, pulmonary embolism, consolidation, and ARDS. However, bedside transthoracic echocardiography was not conclusive as a poor echo window was obtained and patient was unable to lie down supine for a considerable period of time on account of severe respiratory distress. Neither a CT pulmonary angiogram to rule out pulmonary embolism was possible as patient was unstable to be shifted to the radiology department.

ECG revealed right axis deviation, RBBB, and a notch in the apex of the R wave in all inferior leads 2,3,aVF (crochetage sign) (Fig. 1). The findings of ECG are directed to the presence of atrial septal defect as crochetage sign is highly sensitive for ASD. The patient was treated with noninvasive BIPAP ventilation, IV diuretics, nitroglycerine injection, and broad-spectrum antibiotic. After stabilization, next day, transthoracic echocardiography was done, which showed dilated right ventricle, tricuspid regurgitation with right ventricular systolic pressure of 34 mm Hg, and presence of large ostium secundum ASD of 20 mm size with a left to right shunt (Video-A,B,C,D). The patient was discharged on the third day with advice to undergo closure of ASD at the earliest. She then underwent successful ASD device closure, and repeat ECG

Department of Anaesthesia and Critical Care Medicine, Down Town Hospital, Guwahati, India

Corresponding Author: Anuj Sarma, Department of Anaesthesia and Critical Care Medicine, Down Town Hospital, Guwahati, India, Phone: +91 2147483647, e-mail: anujsarma26@gmail.com

How to cite this article: Sarma A. Crochetage Sign: An Invaluable Independent ECG Sign in Detecting ASD. *Indian J Crit Care Med* 2021;25(2):234–235.

Source of support: Nil

Conflict of interest: None

done 3 months later demonstrated complete disappearance of crochetage in inferior leads with the presence of RBBB (Fig. 2).

DISCUSSION

An atrial septal defect is one of the most common congenital heart diseases in the adult population. Clinically, it can be diagnosed by a wide and fixed splitting of second heart along with ejection systolic murmur in upper left sternal border, which can be confirmed by echocardiography. However, clinical signs and echocardiography findings can sometimes be very difficult to interpret and perform, especially when patient presents with respiratory distress and is restless and uncooperative in ICU settings. In such condition, bedside ECG can provide important clues regarding its presence and crochetage sign is among them.

Crochetage sign, resembling work of crochet needle, is characterized by the presence of a notch near the apex of the R wave in inferior lead and is highly specific for the diagnosis of ostium secundum ASD.¹ The specificity increases to 92% if it is present in all inferior leads.² It correlates well with degree of left to right shunting and size of ASD. After closure of ASD, this sign disappears in 35% of patients, making this ECG marker a valuable tool in recognizing ASD.³

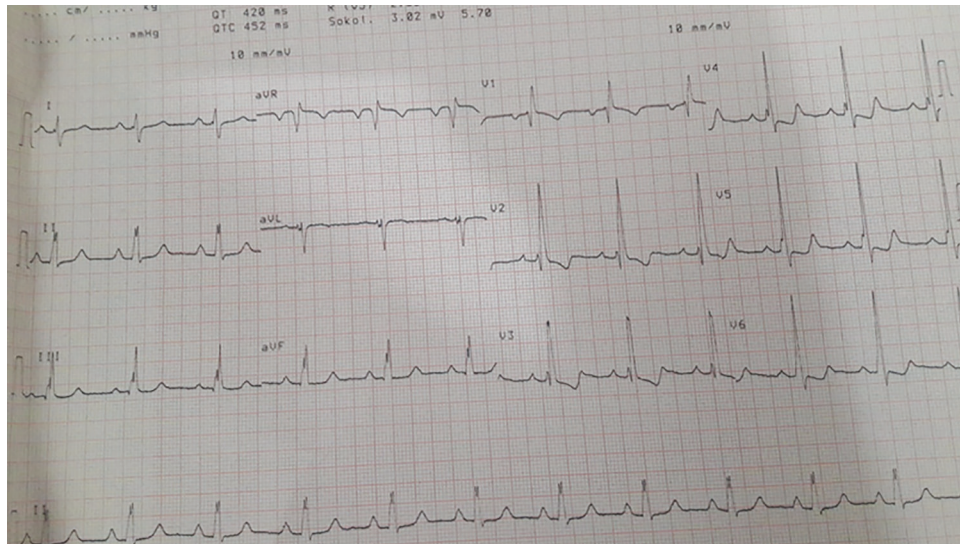


Fig. 1: ECG—right axis deviation, RBBB, and notch in the apex of the R wave in lead 2,3,aVF (crochetage sign)

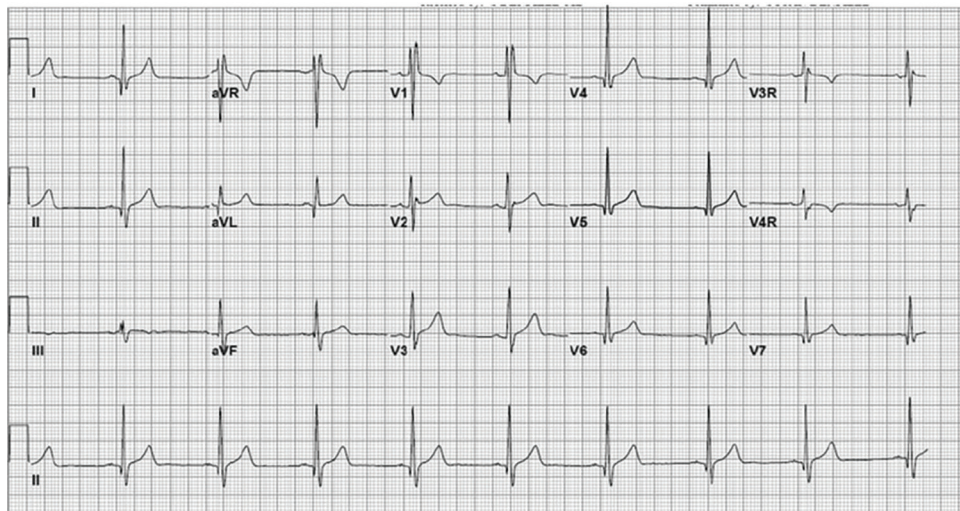


Fig. 2: Disappearance of crochetage sign after ASD device closure

CONCLUSION

In situations where echocardiography is not possible due to nonavailability in some underdeveloped countries, or when there is a poor echo window, ECG by virtue of being simple and cost-effective plays an important role in detecting abnormalities like the one described above.

ACKNOWLEDGMENTS

The author would like to thank the almighty God. He would also like to thank his wife Dr Gargee Borthakur and children Tapashya and Arhee, for all inspiration and support.

ORCID

Anuj Sarma  <https://orcid.org/0000-0002-2499-1107>

REFERENCES

1. Heller J, Hagège AA, Besse B, et al. "Crochetage" (notch) on R wave in inferior limb leads: a new independent electrocardiographic sign of atrial septal defect. *J Am Coll Cardiol* 1996;27(4):877–82. DOI: 10.1016/0735-1097(95)00554-4.
2. Toscano Barboza E, Brandenburg RO, Swan HJ. Atrial septal defect: the electrocardiogram and its hemodynamic correlation in 100 proved cases. *Am J Cardiol* 1958;2(6):698–713. DOI: 10.1016/0002-9149(58)90267-4.
3. Gatzoulis MA, Freeman MA, Siu SC, et al. Atrial arrhythmia after surgical closure of atrial septal defects in adults. *N Engl J Med* 1999;340(11):839–46. DOI: 10.1056/NEJM199903183401103.