



ORIGINAL RESEARCH PAPER

Emergency Medicine

LEFT BUNDLE BRANCH BLOCK WITH ATRIAL FIBRILLATION IN EBSTEIN ANOMALY: A RARE CASE REPORT

KEY WORDS: Ebstein's Anomaly, Left bundle branch block, Atrial fibrillation, rare

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ABSTRACT

Background: Ebstein's anomaly is a rare congenital malformation with an incidence of one per 200000 live births. Majority will have right complete or incomplete bundle branch block. Here we report a case of Left Bundle Branch Block with Atrial fibrillation in ebstein's anomaly.

INTRODUCTION

Ebstein's anomaly is a rare and Incidence is less than 1% of all congenital heart disease(1). Characterised by adherence of septal and posterior tricuspid valve leaflets to the underlying myocardium, downward displacement of the functional tricuspid annulus, dilatation of atrialised right ventricle. Reported incidence of atrial fibrillation in Ebstein's anomaly varies from 9% to more than 50%. In 2007, article published in American Heart Association circulation Journal reported of multifactorial aetiology like genetic, reproductive, and environmental, family history of congenital disease, maternal exposure to benzodiazepines and lithium. Molecular study found that association of cardiac transcription factor NKX2.5 mutation, 10p13- p14 deletion or 1p34.3- p36.11 deletion were found.

In 1988, Carpentier et al classified into four types which were Type A: volume of the right ventricle is adequate, Type B: A large atrialised component of the right ventricle exists but anterior leaflet of the tricuspid valve moves freely, Type C: anterior leaflet of the tricuspid valve is severely restricted in its movement and may cause significant obstruction of the right ventricular outflow tract, Type D: almost complete atrialization of the ventricle except a small infundibular part(2). In up to 95% of patients with Ebstein's anomaly there is delayed activation of the ventricle with appearance of complete or incomplete right bundle branch block(3).

Ebstein's anomaly have more than one accessory pathways in 6-36% cases located around malformed tricuspid valve. Paroxysmal tachyarrhythmias are due to fast conducting atrioventricular accessory pathways. Septal accessory atrioventricular pathway associated with wide QRS tachycardia-ventricular tachycardia, ventricular flutter, ectopic atrial tachycardia, atrial flutter and atrial fibrillation(3).

Aberrant condition defined as conduction through AV node with delay or block resulting in a broader QRS complex. Usually manifests as left or right bundle branch block . When combined with atrial fibrillation and rapid ventricular

response, irregular broad complex tachycardia produced (5).

In the present case, we found that our patient had Ebstein's anomaly with left bundle branch block which presented with AF and fast ventricular rate with aberrancy in hemodynamically unstable state.

Poudel P et al reported a case of Ebstein's anomaly with pericardial effusion in a 55 year old lady in 2022 with similar presentation. ECG showed Atrial fibrillation with Right Bundle Branch Block. Aoyagi S et al reported Ebstein's anomaly in adult patients above 50 years of age where both presented with Tachyarrhythmias(6).

Right bundle branch block is a common presentation in Ebstein's anomaly .Wang. R.Y.C ,et al reported rapid Atrial Fibrillation with Left Bundle Branch Block pattern with Ebstein's Anomaly in May 1983 (6) . No recent published literature available , hence, we report this case of left bundle branch block with atrial fibrillation in association with Ebstein's anomaly.

Case Study

A 33 year young male was brought to emergency department with complaints of sudden unconsciousness in the workplace for 10 min. On examination, patient was drowsy and disoriented with SpO₂- not recordable, SBP of 70mmHg, PR- Low volume, irregularly irregular, 160/min with cold and clammy peripheries. GRBS- 86mg/dl, bilateral pupils reacting to light. Electrocardiograph was showed Left bundle branch block with Atrial fibrillation. ABG showed metabolic acidosis with Type I respiratory failure.

He was started on oxygen supplementation with 10L IV crystalloid bolus of 250ml followed by 50ml/hour was started. Hypotension not improved vasopressor Noradrenaline double strength started at 10ml/hr.

In view of low GCS and threatened airway, patient was intubated. Synchronised cardioversion with 150J done but not responded Next shock delivered with 200J rhythm reverted to

normal.

On secondary survey, patient's relative gave history of severe pain in the back since morning associated with profuse sweating. He was also a known case of Ebstein's anomaly with Atrial septal defect since childhood. Past history of cerebrovascular accident with right saggital sinus and Internal jugular vein thrombosis three years ago and treated. Known case of hypertension since 2 years .He is habituated to alcohol and smoking .

All the routine investigations were sent and shifted to cardiac ICU. Patient was started on Inj. Piperacillin and Tazobactam 4.5g iv TID, Inj. Pantaprazole 40mg iv OD , Inj. Furosemide 40mg IV, Inj. Enoxaparin 40mg subcutaneous , Tab.Amiodarone 200mg BD , Tab. Acetylcysteine 600mg TID. Inj.Dobutamine @3ml/hr.

Patient was extubated on the second day. 2D echo showed dilated RA, atrialised RV, large ASD with bidirectional flow with moderate tricuspid regurgitation. The laboratory investigations showed elevated creatinine for which nephrology advised no dialysis . USG abdomen and pelvis showed renal lymphangiectasia, bilateral grade II or III medical renal disease and right renal simple cortical cyst. NCCT KUB confirmed the same report. Fundoscopy was normal. Further hospital course was uneventful and patient was discharged on day 7.

Table 1:

TROP ONIN	NT PRO BNP	Hae mogl obin	Total Leuco cyte Count	Platele t count	S.crea tinine	Total Biliru bin	Prothro mbin time	INR
<0.56	1074	20	9000	1.78	2.4	1.2	30.8	1.2
pH	pCO ₂	pO ₂	HCO ₃ ⁻	Lactate	Anion Gap	Metabolic acidosis with Type 1 respiratory failure		
7.23	38	69	15.8	1.6	10.5			

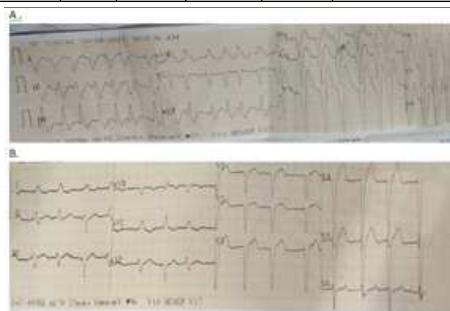


FIG-1: A shows electrocardiograph before synchronized cardioversion, B: shows electrocardiograph before synchronized cardioversion

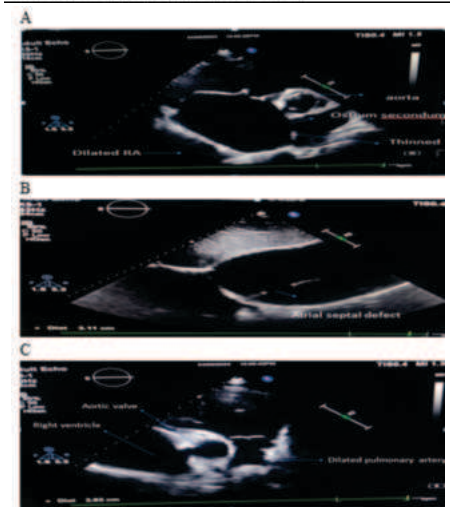


Fig 2 -A: Parasternal short axis shows dilated right atrium with ostium secundum and aorta and thinned interatrial septum. B: shows Atrial septal defect. C: Dilated and atrialaziation of right ventricle with dilated pulmonary artery with no pulmonary hypertension.

CONCLUSIONS:

Ebstein's anomaly can lead to complications like Atrial fibrillation and rarely present in the form of left bundle branch block. Emergency physician should be aware about identifying and managing rare conditions of Ebstein's anomaly.

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