

Case Report

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Syncope to Survival: The Critical Role of Acute Medicine in a Tertiary Care – a Case Report

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Abstract:

Syncope is a common yet potentially life-threatening condition, especially in elderly patients with multiple co-morbidities. Its prompt recognition and intervention can prevent adverse outcomes. This case report entails the story of a 70-year-old woman with diabetes, hypertension, hypothyroidism, and asthma who presented with recurrent syncope. Initial evaluation revealed bradycardia and hypotension, with an ECG confirming complete heart block. Despite a rapid decline to brady-arrest during transfer, timely resuscitation and emergency temporary pacing led to survival. A permanent pacemaker was subsequently implanted, leading to full recovery. This case highlights the life-saving potential of acute medicine and the importance of rapid multidisciplinary coordination in managing high-risk cardiac emergencies such as complete heart block, particularly in resource-constrained settings.

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Introduction:

Syncope is a frequent and often diagnostically challenging condition in the elderly. While many cases are benign, cardiac causes such as complete heart block (CHB) carry significant morbidity and mortality. In patients with multiple comorbidities, CHB may be overlooked, underscoring the importance of acute care facilities capable of rapid diagnosis and intervention.¹ Complete heart block (CHB), a form of third-degree atrioventricular (AV) block, is a rare but critical cause of syncope that can result in severe bradycardia, hypotension, and sudden cardiac arrest.² In elderly patients, such a cause may be under-recognized in the presence of multiple co-existing conditions.

However, it should be kept in mind that timely diagnosis and prompt interventions are important factors influencing outcome.³ Acute medicine facilities in healthcare services may be considered a pivotal issue in offering timely and effective management of these cases.⁴ The reported case highlights an elderly lady with multiple comorbidities who developed syncope and subsequent hemodynamic instability due to complete heart block. If she were not moved to a pacing intervention facility in time, she might not survive. This emphasizes the need for a well-run acute medicine facility in every modern hospital.

Case Summary:

A 70-year-old lady with multiple co-morbidities had been having repeated syncope attacks for one week. She had been diabetic, hypertensive, hypothyroid, and asthmatic for many years. She was on olmesartan (10mg), metformin (1g), and thyroxin (50µg) and inhaled bronchodilators. She was a lonely dweller with all her children living abroad. However, she used to seek medical help regularly and had been in good shape so far until she developed the syncope episodes. Her pre-syncope ECG documents revealed sinus bradycardia (Figure 1). When she was brought to the emergency room of a medical

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college hospital by her brother in the evening, she was febrile but conscious and had a BP of 90/70mmHg and a pulse of 45/min. Her chest findings were normal. She was admitted to the medicine inpatient from where she was soon transferred to CCU (Coronary Care Unit) as both her pulse and BP dropped, and ECG showed clear evidence of complete heart block (Figure 2). There she received the first dose of intravenous atropine and other supportive measures. Anticipating the grave consequences of complete heart block, the doctors in the CCU promptly arranged for her to be shifted to the nearest Cath Lab facility 2 kilometers away, in an ambulance and with oxygen. However, she was received there in a state of cardiac arrest, due to asystole, which is common in these patients. Immediate administration of further doses of intravenous atropine and performing a prompt cardiopulmonary resuscitation (CPR) did

not produce significant improvement, and she was rushed to the Cath Lab for immediate intervention. An emergency temporary pacemaker was inserted (Figure 3a). Subsequently, the patient became hemodynamically stable. The patient's clinical condition and ECG features (Figure 4) improved rapidly. Her biochemical parameters were simultaneously assessed. They revealed normal TSH, trop I, electrolytes, and arterial blood gas. But she had low hemoglobin, mildly raised CRP (C-reactive protein), and raised serum creatinine suggestive of AKI (Acute Kidney Injury), sepsis, and anemia (Table 1). After three days of stabilization and treatment of underlying anemia, sepsis, and acute kidney injury, the patient underwent single-chamber permanent pacemaker implantation. Her recovery was uneventful thereafter.

Table 1: Hematological and biochemical parameters at presentation and after one week

	Test parameter	At presentation	After one week
1	Troponin I	<0.01ng/ml	-
2	Random blood glucose	8.4 mmol/L	-
3	Hemoglobin	9.5 gm/dl	11.1 gm/dl (after packed cell transfusion)
4	ESR	64mm	54 mm
5	Total count of WBC	9,200/cu-mm	9,400/cu-mm
6	Differential count of WBC	N-76%, L- 19%, M-2%, E-3%,	N-76%, L- 20%, M-3%, E-3%
7	Platelet count	2,00,000/cu-mm	2,80,000/cu-mm
8	CRP	24.3 mg/L	3.1 mg/L (after antibiotic administration)
9	Creatinine	3.9 mg/ml	0.9 mg/ml
10	Electrolytes	Na- 135 mmol/L K- 4.09 momol/L Cl- 104 mmol/L	Na- 145 mmol/L K- 4.12 momol/L Cl- 111 mmol/L
11	Calcium	9.1 mg /dl	-
12	Ferritin	243 µg /dl	-
13	Iron	20 µg /dl	-
14	TSH	2.21 µIU/ml	-
15	Albumin	3.1 gm/dl	-
16	SPO ₂	98% in room air	-
17	ABG	PH- 7.46 PaO ₂ -62 mmHg CO ₂ -30 mmHg HCO ₃ -22.7 mmol/L	-
18	Bleeding time	4 min	-
19	Clotting time	6 min	-
20	Prothrombin Time	Patient 13 sec Control 12 sec INR 1:1.09	-
21	ALT	26 U/L	-
22	RAT for COVID-19	negative	-

ESR-Erythrocyte Sedimentation Rate, WBC-White Blood Corpuscle, CRP-C-Reactive Protein, TSH- Thyroid Stimulating Hormone, ABG-Arterial Blood Gas, INR-International Normalized Ratio, ALT- Alanine Aminotransferase, RAT- Rapid Antigen Test

Figure 1: ECG before event showing RBBB and sinus bradycardia

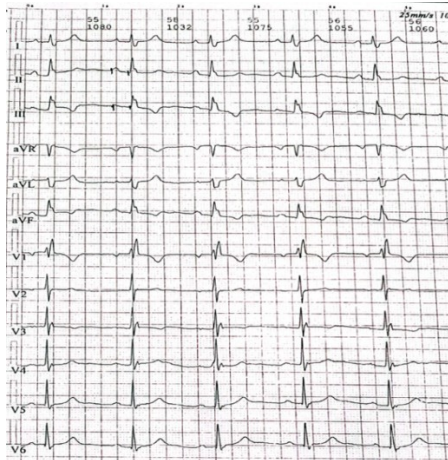


Figure 2: ECG showing complete heart block when syncope developed

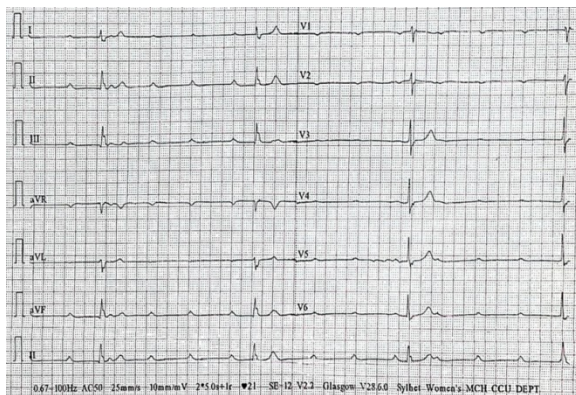


Figure 3 : (a) Immediate insertion of temporary pace maker (b) Subsequent permanent pacemaker implantation

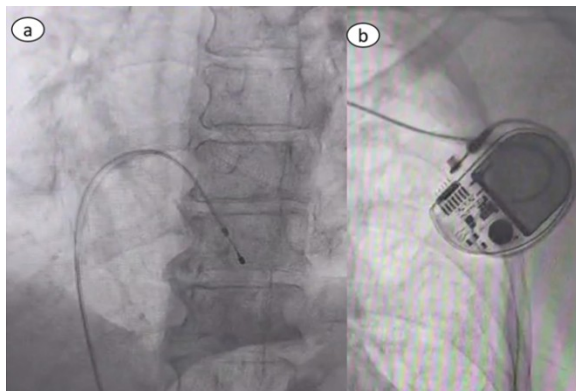
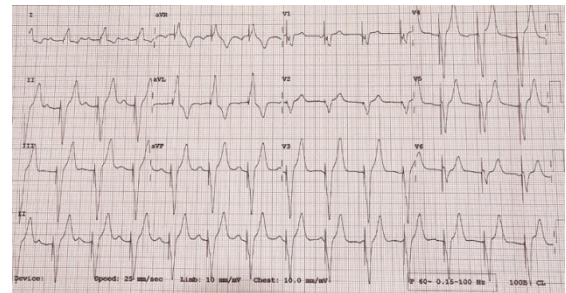


Figure 4: ECG after temporary pacemaker insertion



Discussion:

Complete heart block (CHB) represents a serious cardiac conduction disorder that can lead to syncope, bradycardia, hypotension, and even sudden cardiac arrest. In elderly patients with multiple co-morbidities, its presentation may be subtle or attributed to other underlying illnesses, delaying diagnosis and intervention.⁵ Moreover, the outcome may be rendered unfavorable even with best treatment options due to the co-morbidities.⁶

Age-related degeneration of the electrical conduction system, particularly the AV node in aged patients; underlying heart disease like ischemic heart disease or valvular heart disease; and complete AV block play important roles in pathophysiology. These all lead to inadequate blood flow to the different parts of the body, particularly to the brain.^{5,6}

In the elderly population, CHB may lead to an increased risk of falling and sustaining injuries due to dizziness and fainting. There may be increased chances of mortality due to heart failure or other comorbidities (uncontrolled diabetes, hypertension, or lung disease) complicating the management of CHB. It may also lead to cognitive impairment due to reduced blood flow to the brain.⁵

In this case, the patient's recurrent syncope was initially non-specific but warranted careful evaluation given her age and background. Hypothyroidism, acute myocardial infarction, electrolyte imbalance, hypoglycemia, diabetic autonomic neuropathy, dehydration and adverse effects of drugs were the etiological factors to be

considered in the case but detailed history, physical examination and investigation findings almost nullified them as causes. So, it might be an idiopathic CHB.^{7,8} It could fit well with the diagnosis of BRASH syndrome only if the patient had hyperkalemia. Though olmesartan, an angiotensin receptor blocker, is not a classic AV blocker like beta-blockers, but it could contribute to a hyperkalemia and renal perfusion issues. It is also not clear in the case whether renal impairment occurred before or after the AV nodal block.⁹

The detection of CHB on the ECG (no consistent relation between P waves and QRS complexes, known as AV dissociation; there are more P waves than QRS complexes) and the progressive deterioration in the patient's hemodynamic status demanded an urgent intervention. The swift involvement of coronary care and coronary intervention teams saved the patient even after cardiac arrest. However, the transfer of the patient to another facility to get Cath Lab support, obviously was a precarious task, as she developed a brady-arrest during the shift. Moreover, the patient's brady-arrest during transfer illustrates the presumable fatal outcome without definitive pacing support.¹⁰ In addition to the cardiac issue, systemic findings, such as elevated serum creatinine, anemia, and raised CRP suggested underlying sepsis and AKI. These findings further complicated the clinical picture, emphasizing the importance of a holistic approach that includes managing both the primary cardiac event and secondary systemic issues.¹¹ Insertion of a permanent pacemaker was planned after the insertion of the temporary one, as no apparent removable cause of CHB was found. Though DDD pacemaker (Dual chamber pacing-Dual chamber sensing-Dual function pacemaker) was the best choice of permanent pacemaker in this type of patient, a single chamber pacemaker was chosen on purpose, to reduce the procedure time with all the co-morbidities that could influence the outcome in this patient.¹²

In CHB, a permanent pacemaker is the primary treatment to restore cardiac rhythm and output. While awaiting a permanent pacemaker, in an acute and emergency situation where the patient

is hemodynamically unstable, a temporary pacemaker could be a bridge to a permanent solution or recovery. While a temporary pacemaker is less invasive and often can be done bedside, it has a higher risk of complications like infection and dislodgement. In contrast, a permanent pacemaker is a long-term solution that offers a reliable and stable heart rhythm but is a surgical procedure.¹²

The management of complete heart block requires rapid diagnosis, hemodynamic stabilization, and timely access to pacing interventions, all of which can be best facilitated in a well-equipped acute medicine setting. Tertiary care hospitals must have dedicated acute medical services capable of early recognition and prompt escalation to coronary care units or catheterization labs. In resource-limited or logistically constrained environments, delays in intervention can lead to catastrophic outcomes such as cardiac arrest, multi-organ dysfunction, even death.^{4,13} The presence of an acute medicine unit ensures streamlined coordination between emergency, internal medicine, and cardiology teams, ultimately reducing time to definitive treatment and improving survival rates in patients with life-threatening conduction disorders.

The index patient's successful permanent pacemaker insertion and subsequent stabilization reflect the importance of rapid diagnostics, and access to interventional cardiology services in tertiary care hospitals. These days the importance of acute medicine facility in tertiary hospitals cannot be over emphasized.

Conclusion:

Critical patients can appropriately be managed with timely diagnosis and intervention in the specially organized and synchronized facility of acute medicine. It can save lives of the millions. Such a setting is indispensable part of modern medical services.

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