Complete Heart Block in a Case of Rheumatoid Arthritis

Amar Pandit*, Vikram Londhey**, Bharati Chawla*, Umesh Khedkar***, Sridhar Sundaram****, DS Asgaonkar†

Abstract
We report a case of complete heart block in a patient with rheumatoid arthritis because of its rarity and unusual features like younger age, short duration and negative rheumatoid factor.

Case Report

A 42 year old lady had presented to a primary care hospital with a history of low grade fever and breathlessness on exertion (Class II NYHA) of 8 to 10 days duration. An ECG had revealed a complete heart block. The patient was referred to our hospital.

The patient did not complain of giddiness, syncopal attacks, chest pain, palpitations or pedal oedema. There was a history of joint pains involving small joints of the hands and feet and the right shoulder joint since one year, with morning stiffness lasting for 60 to 90 minutes. She had been on ayurvedic treatment. There was no history of oral ulcers, photosensitive rash, hair loss, or abortions. She did not suffer from hypertension, diabetes mellitus or ischaemic heart disease. There was no family history of autoimmune disorders.

On examination, she was afebrile, pulse rate was 52/minute, regular, blood pressure of 120/70 mm Hg, and respiratory rate of 15/minute. JVP was not raised and showed cannon waves. There was no icterus, clubbing, lymphadenopathy or goitre. Her cardiovascular and respiratory system examination did not reveal any abnormality.

There was tenderness involving all PIP and MCP joints of both hands and MTP joints of both feet. The right middle PIP joint was swollen. There were no subcutaneous nodules or any other extra-articular manifestations.

Investigations revealed haemoglobin of 11.5 gm%, leucocyte count of 9100 cells/mm³, platelet count 211,000 cells/mm³. ESR was 110 mm per hour. Liver function tests, renal function tests, electrolytes, blood glucose, uric acid and thyroid function tests were normal. ECG showed complete heart block with atrial rate of 75/minute and ventricular rate of 58/minute (Figure 1). X ray chest was normal. 2D echo showed LVEF of 60%, mild mitral regurgitation (probably functional as there was no thickening of leaflets or chordae), no regional wall motion abnormality, PASP by TR jet of 30 mm Hg and no evidence of clot, vegetations or pericardial effusion.

X ray of hands revealed a soft tissue swelling around the right third PIP joint. X ray of the right foot revealed erosions in the right first PIP joint (Figure 2). Rheumatoid factor was negative. CRP was normal. Anti CCP level was 154 RU/mL (normal level being 0 to 5 RU/mL).

The DAS was 6.84. The patient was started on methotrexate (10 mg/week)
and hydroxychloroquine (400 mg/day) along with anti inflammatory drugs. The joint pain subsided over a period of one week. There was no change in the ECG findings. The patient has undergone a pacemaker implantation and continues to be well. At 3 months follow up, the joint pains and swelling have responded to treatment.

**Discussion**

Rheumatoid arthritis (RA) is a chronic inflammatory disease of unknown aetiology. It is a systemic disease, with extraarticular manifestations, including subcutaneous nodules, ocular, lung and cardiac involvement, peripheral neuropathy, vasculitis, and haematologic abnormalities.

The spectrum of cardiac disease in rheumatoid arthritis includes pericardial effusion, cardiomyopathy, valvular involvement, conduction defects and coronary artery disease.

Atrio-ventricular and intra ventricular conduction disturbances are described in patients with RA. These could be RBBB, hemiblocks or AV blocks of any degree. Complete AV block is rare, with an approximate incidence of 1 in 1000 patients with rheumatoid arthritis.\(^3,4\) It can develop suddenly, being discovered after syncope or found unexpectedly on routine physical and electrocardiographic examination.\(^4\) Lesser degrees of block may precede complete heart block for varying periods, sometimes with intervening periods of normal conduction.\(^4,5\) In a case series, M Ahern et al reported 4 out of 8 patients with CHB progressing from a lesser degree of AV block or bundle branch block in 24 hours to 7 years. It is possible that such changes are not uncommon but remain undiagnosed.\(^4\)

The conduction disturbances are usually mild, asymptomatic, and incidentally diagnosed by electrocardiography. There is a female preponderance.\(^4\) The mean duration of rheumatoid arthritis prior to the development of the block is 10 to 12 years,\(^4,5\) although shorter duration is known,\(^4\) as was in our case. In the case series published by M Ahern et al, the average age for development of complete heart block was about 60 years.\(^5\)

Complete heart block in rheumatoid arthritis occurs generally in patients with established erosive rheumatoid disease.\(^4,5\) Patients usually have other extraarticular manifestations, which our patient did not have. Most patients have a high titre of rheumatoid factor.\(^1\) Although rheumatoid factor was negative, she had a very high anti CCP antibody titre. CHB usually suggests active disease though it can occur in patients with well-controlled disease.\(^5\)

The likely causes of complete heart block in patients with rheumatoid arthritis are (1) Direct involvement of the conducting system with granulomas and subsequent fibrosis,\(^2,4\) (2) Extension of the inflammatory process from the base of the aorta or mitral valves to the conduction pathways,\(^4\) (3) Secondary amyloidosis,\(^1,3-5\) (4) Haemorrhage into a rheumatoid nodule,\(^4\) (5) Coronary arteritis causing ischaemia of the conduction tissue,\(^1\) (6) Focal myocarditis due to RA\(^4\) and (7) Premature coronary artery disease due to accelerated atherosclerosis in patients with RA.\(^6\) We consider the involvement of conduction system with granulomas and fibrosis as the likely aetiology of CHB in our patient, although an endomyocardial biopsy would be required for confirmation, which was not done in our patient due to financial restrictions.

**Treatment**

Spontaneous recovery is possible, but extremely rare.\(^4\) Conduction blocks once established in the disease do not respond to anti-inflammatory treatment.\(^1\) The indications for a permanent pacemaker are the same as any patient of complete heart block without RA. Once a pacemaker has been installed, the prognosis is good in the absence of other cardiac complications.

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**Fig. 1:** ECG showing complete heart block

**Fig. 2:** Radiograph of the right foot showing erosions in the first PIP joint (arrow)
such as congestive cardiac failure.

This patient could have CHB unrelated to RA. However, we postulate that since the patient had high ESR and DAS, erosive arthritis, high anti CCP antibody titre and relatively younger age of presentation, CHB could be attributed to RA and hence we report this case.

References


