

**RHEUMATOID ARTHRITIS MEETS RHEUMATIC HEART DISEASE: A
MULTISYSTEM COLLISION CREATING THERAPEUTIC ROADBLOCKS**¹*N. K. Gupta, ²Gargi Gupta¹Professor, Department of Medicine, Pacific Institute of Medical Sciences, Udaipur, India.²Research Associate.***Corresponding Author: N. K. Gupta**

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ABSTRACT

Rheumatoid arthritis (RA) is a chronic autoimmune disorder with systemic manifestations, and its coexistence with rheumatic heart disease (RHD) presents unique clinical challenges. We describe a middle-aged woman with established RA who developed severe rheumatic mitral regurgitation with pulmonary hypertension, alongside renal dysfunction and pulmonary fibrosis. Management was complicated by contraindications to conventional DMARDs: hydroxychloroquine was withdrawn due to QT prolongation, and methotrexate was avoided owing to fibrotic lung changes, leaving sulfasalazine as the preferred alternative. She was subsequently referred for surgical valve replacement. This case underscores the complexity of treating RA patients with overlapping cardiovascular and pulmonary disease, where standard therapies may be restricted. It highlights the importance of early cardiac evaluation in symptomatic patients and calls for further research into safer, tailored immunomodulatory strategies for individuals with multi-organ involvement.

INTRODUCTION

Rheumatoid arthritis (RA) is a chronic, systemic autoimmune disorder characterised primarily by persistent synovial inflammation and progressive joint destruction. Beyond musculoskeletal involvement, RA is also associated with a wide spectrum of extra-articular manifestations, including pulmonary fibrosis, renal dysfunction, hematological abnormalities, and cardiovascular disease, all of which significantly contribute to morbidity and mortality. The long-term use of disease-modifying antirheumatic drugs (DMARDs), although essential in controlling disease activity, may further complicate management due to drug-specific toxicities, necessitating careful therapeutic selection tailored to the individual patient.^{[1][2]}

Rheumatic heart disease (RHD) remains an important cause of acquired valvular heart disease, particularly in low- and middle-income countries, with the mitral valve being commonly affected.^[3] Severe mitral regurgitation or stenosis due to rheumatic involvement may present with progressive dyspnea, palpitations, pulmonary hypertension, and eventual right-sided heart failure if

untreated.^[2] While RA and RHD are distinct entities, their coexistence in a single patient creates unique diagnostic and therapeutic challenges, particularly when compounded by systemic complications such as anemia, renal impairment, and pulmonary fibrosis.^{[3][4]}

Here, we present the case of a middle-aged female with established RA who developed severe rheumatic mitral regurgitation along with pulmonary and renal involvement. The case highlights the complex interplay between autoimmune disease, rheumatic valvular pathology, and systemic comorbidities, underscoring the need for early recognition, multidisciplinary care, and timely surgical referral to optimize long-term outcomes.

CASE PRESENTATION

A 41-year-old female presented with complaints of bilateral wrist joint pain that had persisted for the past one to two years. Over the last three weeks, she developed shortness of breath on exertion, fatigue, palpitations, and swelling of both legs. The breathlessness was gradual in onset, progressive in nature, and occurred with mild exertion such as walking

short distances or climbing five to six stairs. It was relieved by rest and was often accompanied by easy fatigability and palpitations. She also noticed pedal oedema for the last two weeks, which was progressive and pitting in nature. Joint pain was more prominent in the right wrist, elbow, and carpal bones. She was a known case of rheumatoid arthritis, diagnosed one to two years ago, and had been started on hydroxychloroquine 200 mg once daily.

On general examination, the patient measured 150 cm in height, weighed 42 kg, and had a BMI of 18.6. She appeared pale and had bilateral pedal oedema, though there was no icterus, cyanosis, clubbing, or lymphadenopathy. Her blood pressure was 104/70 mmHg in the right arm in the supine position. Her pulse rate was 92 per minute, regular in rhythm, with all peripheral pulses palpable and equal. Her respiratory rate was 20 per minute. Examination revealed a cylindrical chest with no scars or sinuses, but a left parasternal heave was present. The apex beat was located in the fifth intercostal space, half an inch medial to the midclavicular line. Percussion showed the right heart border at the right sternal edge and the left heart border at the apex. On auscultation, the mitral area revealed a loud first heart sound of varying intensity, a normal second heart sound, an opening snap, and a soft mid-diastolic murmur of grade 2/4 best heard in the left lateral position with radiation to the left axilla. No third or fourth heart sound was heard. In the tricuspid area, the first and second heart sounds were normal with no additional sounds. In the pulmonary area, the first heart sound was normal with a loud second pulmonary component, while the aortic area had normal first and second heart sounds.

Electrocardiography showed sinus rhythm with a normal axis, P-wave abnormalities in V1 suggestive of left atrial dilatation, and left ventricular hypertrophy as per the Sokolow-Lyon criteria. Two-dimensional echocardiography subsequently revealed rheumatic heart disease with severe mitral regurgitation, showing a thickened anterior mitral leaflet, a fixed posterior mitral leaflet annulus with tip involvement, severe eccentric mitral regurgitation, moderate-to-severe tricuspid regurgitation with right ventricular systolic pressure of 50 mmHg, and a dilated left atrium. Left ventricular ejection fraction was preserved at 60%, with no regional wall motion abnormalities, intact interatrial and interventricular septum, and no evidence of clot, vegetation, or pericardial effusion. The inferior vena cava was normal.

Peripheral blood smear examination revealed reduced red cell mass with microcytic hypochromic cells, anisopoikilocytosis, tear-drop cells, target cells, and elliptocytes, consistent with microcytic hypochromic anemia. The RA factor was positive. Ultrasound of the abdomen demonstrated a small left kidney, while renal

function tests showed elevated serum creatinine of 2.8 mg/dL and blood urea of 78 mg/dL.

In view of QT prolongation, hydroxychloroquine was discontinued, and the patient was switched to sulfasalazine. Methotrexate was avoided due to fibrotic changes noted on the chest X-ray. Given the presence of severe mitral valve disease, the patient was advised to undergo valve replacement surgery and was referred to the cardiothoracic and vascular surgery department for further management. The patient underwent the required surgery and is doing well.

DISCUSSION

The coexistence of rheumatoid arthritis and rheumatic heart disease in the same patient presents a rare and complex clinical challenge. In this case, the progression of severe mitral regurgitation with pulmonary hypertension was the key driver of the patient's symptoms, underscoring the value of echocardiographic assessment in symptomatic patients with suspected valvular disease who develop persistent dyspnea or exertional limitation.^{[3][4]} While physical examination retains diagnostic importance, echocardiography remains indispensable in accurately characterizing valvular dysfunction and guiding surgical referral at an appropriate stage.

The management was further complicated by therapeutic limitations. Hydroxychloroquine, commonly used in the management of rheumatoid arthritis, had to be discontinued due to QT interval prolongation. Hydroxychloroquine has recognized electrophysiological effects, and QT prolongation has been reported in patients receiving long-term therapy, with chronic kidney disease and other cardiovascular comorbidities identified as potential risk factors.^[5] Methotrexate was avoided in view of the fibrotic changes identified on chest imaging. However, the relationship between methotrexate and chronic RA-associated interstitial lung disease is more complex than previously considered; although methotrexate-associated pneumonitis is recognized, current evidence does not establish methotrexate as a cause of chronic fibrotic RA-associated ILD.^{[6][7]} This therapeutic dilemma illustrates the difficulty of selecting DMARD therapy when cardiac, pulmonary, and renal comorbidities coexist.

From a research perspective, this case raises important questions regarding DMARD selection in patients with overlapping pulmonary and cardiovascular disease. Current evidence regarding the association between DMARD exposure and RA-associated ILD remains heterogeneous, and recent systematic reviews have emphasized the need for further well-designed prospective studies.^[8] Emerging evidence also suggests that biological and targeted synthetic DMARDs may have a role in stabilizing RA-associated ILD, although comparative evidence remains limited and treatment decisions must be individualized.^[9] However, evidence

specifically addressing patients with simultaneous pulmonary fibrosis, significant structural cardiac disease, and renal dysfunction remains limited. Future prospective studies and multicenter registries should therefore evaluate treatment response and adverse outcomes according to pulmonary, cardiac, and renal phenotypes rather than considering these comorbidities in isolation.

This case, therefore, emphasizes not only the importance of multidisciplinary management involving rheumatology, cardiology, nephrology, and cardiothoracic surgery, but also the need to develop evidence-based treatment frameworks for patients with overlapping autoimmune and structural cardiac disease. In the future, integrating individualized immunomodulatory strategies with timely correction of severe valvular disease may provide a pathway towards improved outcomes in such complex presentations.^{[4][9]}

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