# Le rôle du méthotrexate dans le traitement de la myocardite compliquant la polyarthrite rhumatoïde : A propos d'un cas

# Methotrexate treats rheumatoid arthritis' related dilated cardiomyopathy in rheumatoid arthritis: case report

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**Résumé**

L'atteinte cardiovasculaire est fréquemment reportée chez les patients suivis pour polyarthrite rhumatoïde (PR).
Cependant, la myocardite a été rapportée comme une complication rare de la maladie dont le diagnostic et la prise en charge thérapeutique demeurent non codifiés. À notre connaissance, il n'y avait aucune étude sur l'impact du méthotrexate (MTX) sur la fonction cardiaque.
Nous rapportons le cas d'un patient suivi pour polyarthrite rhumatoïde compliquée d'une myocardite dont l'évolution était favorable après sa mise sous méthotrexate.

Mots-clés
Myocardite, polyarthrite rhumatoïde, méthotrexate

**Summary**

Cardiovascular disease is common and increased in rheumatoid arthritis (RA). However, myocarditis has been reported as a rare extra-articular feature with a challenging management. To our knowledge, there were no studies about Methotrexate (MTX) efficacy on heart
function and progression of the ejection fraction in patients with rheumatoid myocardiopathy neither on its tolerance in such condition.
We report a case of myocarditis in a patient diagnosed with RA, whose heart function was normalized after Methotrexate therapy.

Keywords
Myocarditis, rheumatoid arthritis, methotrexate

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## INTRODUCTION

Rheumatoid arthritis (RA) is the most common type of autoimmune arthritis. Cardiovascular disease is markedly increased in RA partly due to accelerated atherosclerosis from chronic inflammation and the high prevalence of traditional cardiovascular risk factors among these patients [1]. Myocarditis has been reported as a rare and uncommon affection in RA because in most cases, it's asymptomatic. However, it can lead to dilated cardiomyopathy and heart failure [2].

Treatment in RA patients with such condition is limited and controversial. Methotrexate place in RA induced myocarditis still understudied. The aim of this report is to bring out an observation in which Methotrexate improved substantially heart function after two years of followup of a patient with RA dilated cardiomyopathy.

## CLINICAL CASE

A 53-year-old man presented with a 4-week history of chronic polyarthritis predominant in the handswith morning stiffness that lasts >30 min, high erythrocyte sedimentation rate (ESR) and C related peptide (CRP), positive rheumatoid factor, and positive anti citrullinated peptide antibody. He was diagnosed with rheumatoid arthritis (RA) according to the 2010 ACR/EULAR criteria [3].

The patient had also a recent and progressive history of dyspnea NYHA II-III. Upon physical examination, there was an irregular tachycardia and no signs of congestive heart failure. On the EKG, atrial fibrillation was evident (120 beats/min) and the laboratory results showed a high Nt-proBNP (1788 pg/ml). Echocardiogram manifested a dilated left ventricle with global hypokinesia and a poor systolic function (LVEF 25%). A cardiac Magnetic Resonance Imaging (MRI) was carried out revealing non-ischemic dilated cardiomyopathy, LEVF 22%, without myocardial fibrosis. Cardiac catheterization and coronagraphy showed normal coronary arteries. Upon etiological investigations, the exact cause of this heart failure remained unknown. So, after being diagnosed initially with idiopathic dilated cardiomyopathy and heart failure, treatment with diuretics, amiodarone, ramipril, beta-blocker, and acenocoumarol was initiated. We started also Methotrexate with a weekly dose of 20 mg and oral corticosteroids (prednisone 15 to 20 mg daily), pulses of methylprednisolone were administrated for arthritis flares.

Ejection fraction had been checked 6 months later and was 35 %, and after 2 years since the onset of treatment, an echocardiogram revealed a significant improvement in LEVF (45-50% then 60%) and normal left ventricle dimensions and contractility. NT-proBNP was 660 mg/ml.

Basing on these findings, the patient was diagnosed as inflammatory cardiomyopathy caused by rheumatoid arthritis and spectacularly healed with Disease Modifying anti Rheumatic drugs (DMARDs).

## DISCUSSION

In this case we highlight an observation of an inflammatory cardiomyopathy caused by rheumatoid arthritis and spectacularly healed with Disease Modifying anti Rheumatic drugs (DMARDs).

Dilated cardiomyopathy is currently defined by the presence of left ventricular or biventricular dilatation and systolic dysfunction that is not explained by abnormal loading conditions (hypertension and valvular heart disease) or coronary artery disease. It is the third most common cause of heart failure and the most frequent reason for heart transplantation [4] with an estimated prevalence of approximately 1 case out of 2500 individuals in the general population [5]. Younger patients (<55 years) are more frequently affected [6].

Causes of dilated cardiomyopathy can be idiopathic (most cases), genetic, alcoholic cardiomyopathy, nutritional deficiency, electrolyte disturbances, endocrine disorders, toxicity from agents like ethanol and cocaine, peripartum cardiomyopathy and autoimmune diseases.

An important cause of dilated cardiomyopathy is myocarditis witch is identified as an inflammatory disease of the heart muscle cells [7] and is pathologically clear by histology as infiltration of mononuclear cells to the myocardium.

Although a viral prodrome is classically associated with myocarditis, symptoms are highly variable and manifestations range from subclinical disease to complications such as arrhythmia and heart failure. Etiologies are essentially infectious diseases (viral), However, myocarditis can also accompany systemic inflammatory disorders such as lupus or Kawasaki disease through an autoimmune reaction.

It has been also reported in rheumatoid arthritis as an extra-articular feature [8].

Although cardiovascular features in RA are common such

as pericarditis (the most common cardiac involvement in RA), coronary vasculitis, cardiac amyloidosis, valve diseases, ischaemic disease [9], myocarditis remains uncommon and only a few cases have been reported. Studies have shown that In these patients with overt CHF, levels of inflammatory cytokines (TNF alpha, IL6, TNF alpha receptors) are elevated and correlate with the severity of the disease [10] and that systemically released autoantibodies and cytokines cause histologic alterations in the myocardium. Two types of myocardial lesions can be seen: non-specific or interstitial myocarditis and a specific lesion, granulomatous [11].

Etiological treatment should be established, in our case, a significant increase in LEVF occurred after starting antirheumatic drugs and corticosteroids. In the literature, Methotrexate (MTX) has been shown to reduce the CVD risk, probably by reducing the systemic inflammation that leads to atherosclerosis, to confer a 20% reduction in the risk of hospitalization for congestive cardiac failure, and to reduce the risk of developing heart failure by half compared with those not receiving MTX [12]. To our knowledge, there were no studies about the effect of MTX or even corticosteroids on heart function and progression of the ejection fraction in patients with rheumatoid myocardiopathy.

## CONCLUSION

Myocarditis is identified as an inflammatory disease of the heart muscle cells that can lead to dilated cardiomyopathy, severe cardiac heart failure, and arrhythmia. It has been reported as a rare and uncommon affection in RA, with two histologic forms, granulomatous (specific) and interstitial.

Early treatment of rheumatoid arthritis must be established because il could highly improve ejection fraction and the prognosis in these patients like it was observed in our case.

**Key Messages:**

Myocarditis is a rare extra-articular manifestation in rheumatoid arthritis

Rheumatoid arthritis related myocarditis should be suspected before conduction disturbance with negative aetiological research.

Methotrexate is a safe and effective treatment in RA induced myocarditis.

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