

## Case Report

# Multifocal Atrial Tachycardia in a Patient Scheduled for Cataract Surgery: to Operate or Not to Operate, that is the Dilemma

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## Abstract

**Background:** Multifocal Atrial Tachycardia (MAT) is an uncommon supraventricular arrhythmia that most commonly appears in elderly patients with underlying lung disease. It can be easily mistaken with atrial fibrillation.

**Case presentation:** We identified an episode of MAT in an asymptomatic patient who was scheduled for ambulatory cataract surgery. After a detailed physical examination and Focused Cardiac Ultrasound (FoCUS), we decided to proceed with the surgery.

**Conclusion:** When MAT occurs in the preoperative period, it can be challenging to decide whether to proceed with the surgical procedure or to perform prior evaluation by a cardiologist. Anamnesis, physical examination, and FoCUS are useful tools in making this decision.

**Keywords:** Multifocal atrial tachycardia; Atrial fibrillation; Electrocardiogram

## Background

Multifocal Atrial Tachycardia (MAT) is an uncommon supraventricular arrhythmia. It is characterized by chaotic and irregular atrial activity with atrial rates between 100 and 180 beats per min (bpm). In most cases, it appears in the elderly and critically ill patients during exacerbations of an underlying lung disease [1].

During the perioperative period, the diagnosis of MAT can be difficult because it can easily be confused with Atrial Fibrillation (AF). There is very little information about MAT in the perioperative setting, and deciding whether to proceed with scheduled surgery can be difficult and even controversial.

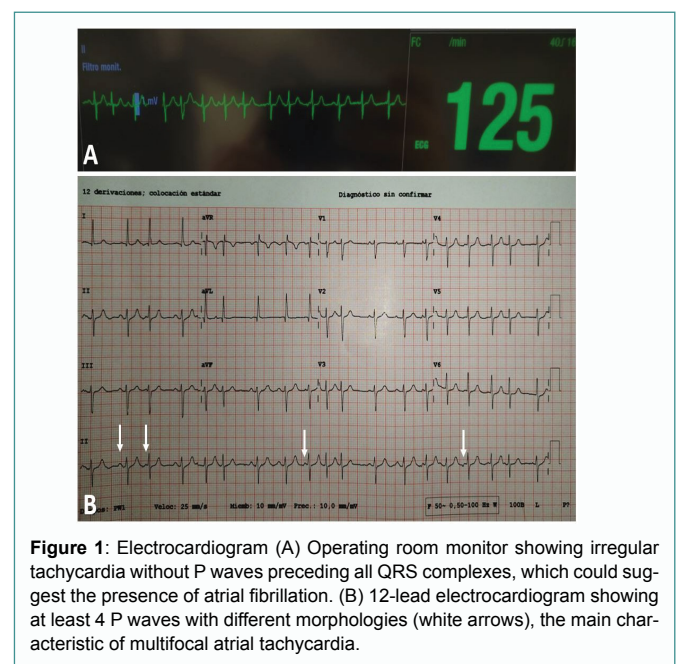
We describe the case of a patient scheduled for unilateral ambulatory cataract surgery, diagnosed with MAT during initial monitoring in the operating room, in which we decided to continue with the surgery and deferred the cardiologic evaluation.

## Case Presentation

An 87-year-old female was scheduled for ambulatory cataract surgery in the left eye under topical anesthesia and monitored anesthetic care. Her medical history is significant for hypertension, without respiratory or cardiac pathology. The patient is completely independent without the need for a helper.

Upon arrival at the ambulatory surgery unit, vital signs were recorded, revealing irregular tachycardia at around 120 bpm, blood pressure of 118/75 mmHg, and peripheral oxygen saturation (SpO<sub>2</sub>) of 95% in room air. The patient denied any cardiopulmonary symptoms (chest pain, palpitations, exertional dyspnea, dizziness, or syncope). Physical examination did not reveal any respiratory pathology or signs of heart failure.

During monitoring in the operating room, irregular tachycardia was observed where not all QRS complexes appeared to be preceded by P waves (Figure 1A). A 12-lead Electrocardiogram (ECG) was performed, showing irregular tachycardia at 114 bpm with narrow QRS complexes and the presence of P waves with at least 4 different morphologies (Figure 1B).



**Figure 1:** Electrocardiogram (A) Operating room monitor showing irregular tachycardia without P waves preceding all QRS complexes, which could suggest the presence of atrial fibrillation. (B) 12-lead electrocardiogram showing at least 4 P waves with different morphologies (white arrows), the main characteristic of multifocal atrial tachycardia.

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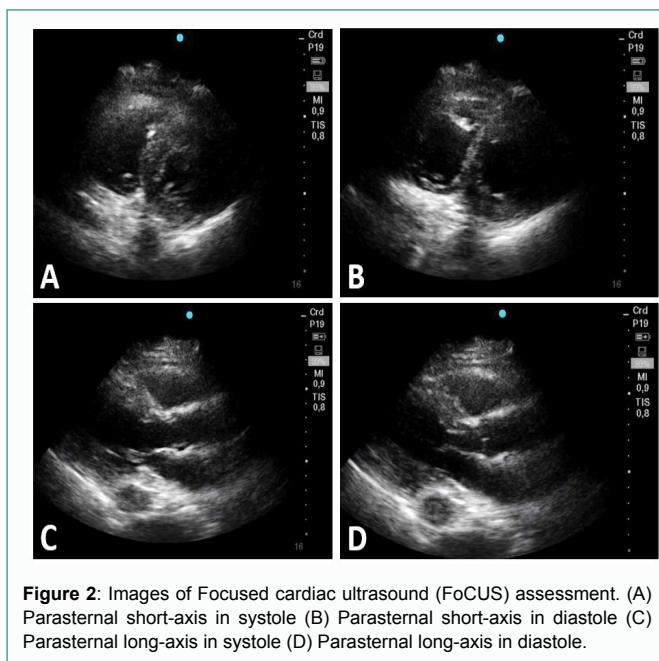
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Focused cardiac ultrasound (FoCUS) was performed, revealing normal systolic biventricular function, non-dilated ventricles and atria, non-thickened aortic and mitral valves, and no evidence of valvular regurgitation (Figure 2).

Given the suspicion of Multifocal Atrial Tachycardia (MAT) in an asymptomatic patient without structural cardiac abnormalities on echocardiographic evaluation, we decided to continue with the procedure under topical anesthesia and close monitoring. The patient underwent the surgery without incidents and was discharged home 90 min after its completion.

The ECG findings were informed to the patient and her family, and a referral to the cardiology clinic was made. She was evaluated by the cardiologist two weeks later, and a new ECG showed sinus tachycardia with an isolated ventricular extra systole. It was decided not to initiate specific therapy and to maintain periodic follow-up.



**Figure 2:** Images of Focused cardiac ultrasound (FoCUS) assessment. (A) Parasternal short-axis in systole (B) Parasternal short-axis in diastole (C) Parasternal long-axis in systole (D) Parasternal long-axis in diastole.

## Discussion

To the best of our knowledge, this is the first reported case of preoperative MAT in the literature, as well as the first in which the patient had no history of respiratory or structural heart disease.

MAT is an uncommon supraventricular arrhythmia. Its incidence has been estimated at 0.05% to 0.32% of ECGs in general hospitals; it usually occurs in association with a history of lung disease (such as chronic obstructive pulmonary disease), pulmonary hypertension, coronary artery disease, cardiac valve disease, hypomagnesemia, or treatment with theophylline [1]. Recently, cases of MAT have been identified in patients with coronavirus disease 2019 (COVID-19) [2].

MAT is usually asymptomatic, and patients only present symptoms of the precipitating condition (respiratory or cardiac). Rarely do patients experience symptoms such as palpitations, or associated conditions such as presyncope or syncope. This is consistent with the asymptomatic presentation of the patient.

The diagnosis of MAT requires the following diagnostic criteria on the 12-lead ECG [3]:

- P-waves with at least 3 different morphologies in the same

lead.

- Atrial frequency greater than 100 bpm.
- P-waves that return to the baseline separated by isoelectric intervals.
- Irregular of PP intervals, as well as variation of PR and RR intervals.

Our case patient met all the electrocardiographic findings; however, she did not present any risk factor associated with MAT. We cannot rule out hypomagnesemia, although she did not show any symptoms of this condition (drowsiness, muscle weakness, nausea, and vomiting) [4].

The decision to continue with the scheduled procedure is controversial. Considering that it is an elective surgery, it would be reasonable to postpone it until cardiological evaluation. Because of the rarity of the condition, no clinical guidelines specifically reference the perioperative management of MAT. The 2022 European Society of Cardiology guidelines for cardiovascular assessment and management of patients undergoing non-cardiac surgery refer to supraventricular tachycardia as a group, suggesting that "usually" it is not necessary to delay surgery, except in cases of suspected pre-excitation and AF requiring ablation due to the risk of sudden cardiac death [5].

The on-site assessment of FoCUS allowed us to rule out structural cardiac abnormalities, such as global or regional dysfunction of the left ventricle, related with ischemic heart disease and congestive heart failure, and right ventricle dysfunction as seen in cor pulmonale. There is emerging evidence that perioperative FoCUS performed by anesthesiologists is a good complement to physical examination for decision making in the perioperative period [6].

Due to the relatively "benign" condition of MAT in a patient with no apparent respiratory or cardiac pathology we decided to proceed with the cataract surgery with close monitoring of the patient and perform the cardiological evaluation after the procedure.

MAT treatment consists of improving the triggering condition. In the absence of obvious decompensated pathology, we considered the use of beta-blockers as a potential treatment, specifically IV metoprolol, which has shown to be beneficial in reducing heart rate in patients with MAT [7]. However, we decided not to use it due to the patient's normal blood pressure throughout the procedure, thus avoiding the risk of arterial hypotension. In the case of more complex surgical procedures, beta-blockers could be a good strategy for heart rate control.

Finally, we want to emphasize the importance of the cardiological consultation. It is necessary to confirm the diagnosis and provide appropriate follow-up for the patient, because although MAT does not require systemic anticoagulation, it may precede the onset of atrial fibrillation or atrial flutter, entities that usually require this therapy to avoid the risk of stroke.

## Conclusion

MAT is an uncommon supraventricular tachycardia that typically occurs in elderly patients during the decompensation of respiratory or cardiac pathology. When it occurs in the preoperative setting, it can be difficult to decide whether to proceed with the surgical procedure or to perform prior evaluation by the cardiologist. Anamnesis, physical examination, and FoCUS are useful tools when making this decision.

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