

# THE ROLE OF RADIOGRAPHY IN ACUTE RHEUMATIC FEVER

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## **Abstract**

Acute rheumatic fever (ARF) is an inflammatory disease that occurs as a complication of streptococcal infection and can affect the heart, joints, skin, and central nervous system. Radiography, despite its limitations, is an important tool in the diagnosis and monitoring of patients with ARF. This article reviews the potential of radiography in assessing disease-related changes, including those in the cardiovascular system and joints.

The case series demonstrates that radiography can be useful for initial diagnosis, detection of complications such as pancarditis and arthritis, and monitoring disease progression. The advantages of radiography compared with other imaging modalities such as echocardiography and magnetic resonance imaging are discussed. In conclusion, radiography is emphasized as an important adjunct to the comprehensive evaluation of patients with acute rheumatic fever.

**Key words:** acute rheumatic fever, radiography, diagnostics, pancarditis, arthritis, visualization, monitoring, streptococcal infection, clinical practice, cardiovascular diseases, joints, inflammation.

## **Introduction**

Acute rheumatic fever is a systemic inflammatory disease that occurs as a complication of streptococcal infection, especially in childhood and adolescence. The main trigger for the development of ARF is infection with group A  $\beta$ -hemolytic streptococcus. Inflammation can affect various organs, including the heart, joints, skin, and brain, and cause a variety of symptoms.

Symptoms of acute rheumatic fever can range from mild to severe. The most common clinical manifestations are polyarthritis, carditis, chorea, erythema, and

subcutaneous nodules. Cardiac involvement in ARF can lead to serious complications such as pancarditis, which may require immediate medical attention.

Chest and joint radiography is one of the available methods for assessing a patient with ARF. This method can reveal changes in the cardiovascular system, such as an enlarged heart, as well as changes in the joints associated with inflammation. Radiography can be useful for diagnosis, monitoring, and assessing the progression of the disease.

This article reviews the role of radiography in the diagnosis and monitoring of acute rheumatic fever, examines the capabilities and limitations of this method, and analyzes clinical cases to identify the main aspects of the use of radiography in the practice of treating patients with ARF.

### Target

The aim of this article is to review the role of radiography in the diagnosis and monitoring of acute rheumatic fever. We aim to clarify when radiography may be useful and to assess its capabilities and limitations compared to other imaging modalities.

Specific objectives of the study include:

1. **Evaluation of the effectiveness of radiography** in the primary diagnosis of acute rheumatic fever and the identification of its complications.
2. **Analysis of the cardiovascular system and joints** using radiography, including detection of pancarditis and arthritis.
3. **Comparing X-ray data** with results from other imaging techniques, such as echocardiography and magnetic resonance imaging, to provide a more complete picture of patients' conditions.
4. **Monitoring the dynamics of the disease** and assessing changes in radiographs depending on the therapy being administered.

Thus, the study aims to analyze existing literature and clinical observations in order to identify the main aspects of the use of radiography in the practice of treating patients with acute rheumatic fever.

## Materials

The study collected data on patients diagnosed with acute rheumatic fever who were examined using radiography in the clinic between 2020 and 2023. The study included patients of both sexes aged 5 to 50 years. A total of 180 cases were analyzed, which allows for reliable results.

Inclusion criteria for the study:

- The presence of clinically expressed symptoms of acute rheumatic fever, confirmed diagnosis based on clinical and laboratory data.
- Results of radiography performed as part of a standard examination.

The study materials included:

1. **Radiographic results** : Images obtained using standard X-ray machines that show the condition of the heart, lungs and joints.
2. **Clinical observations** : Data on symptoms such as shortness of breath, chest pain, oedema, fatigue and general condition of patients.
3. **Laboratory tests** : Levels of inflammation markers (C-reactive protein, erythrocyte sedimentation rate) and other indicators that allow us to assess the activity of the disease.
4. **Functional tests** : Evaluation of cardiac function and joint health, including range of motion and presence of pain.

All data were collected in compliance with ethical standards and rules, as well as patient anonymity. In addition, statistical analysis was performed to assess the significance of the results obtained, which made it possible to establish correlations between radiographic data and clinical manifestations of the disease.

## Methods

The radiography was performed on modern equipment, using standard scanning protocols. The study included standard chest radiographs in direct and lateral projections, as well as radiography of the joints, which allowed for a more complete picture of the condition of the heart and joints.

### X-ray protocols

1. **Cardiac assessment** : Visualization of the size and shape of the heart for enlargement and changes in contour, which may indicate the presence of pancarditis .
2. **Lung condition** : Assessment of the lung fields for the presence of fluid in the pleural cavity, signs of pulmonary hypertension and other pathologies.
3. **Joint analysis** : Assesses the condition of the joints, identifying signs of inflammation such as swelling and changes in bone structure.

### Statistical analysis

Quantitative and qualitative methods were used to analyze the data obtained. Radiographic results were compared with clinical manifestations and laboratory data for a more complete picture of the patients' condition. Statistical analysis was performed using software to assess the significance of the results obtained.

The results were assessed according to the following criteria:

- Correlation between radiographic data and clinical symptoms.
- Evaluation of the dynamics of changes in the condition of the heart and joints depending on the therapy being administered.
- Frequency of detection of complications such as pancarditis and arthritis.

### Discussion of results

The results of the study showed that radiography can have a certain place in the diagnosis and monitoring of acute rheumatic fever. In most cases, radiography successfully detected changes in the heart and joints, which allowed to exclude serious complications.

In 65% of cases, patients with acute rheumatic fever showed changes in cardiac size, which correlated with clinical symptoms such as shortness of breath and chest pain. Radiography also revealed pulmonary hypertension and the presence of fluid in the pleural cavity in 20% of those examined, which is a significant complication of this condition.

The data analysis showed that radiographic findings were useful for detecting changes in the heart and joints, but they did not provide sufficient information about

more subtle pathologies related to inflammation and damage to connective tissue. In some cases, other imaging techniques, such as echocardiography or magnetic resonance imaging, were required for a more detailed analysis of tissue conditions.

### Conclusions

Radiography plays an important role in the diagnosis and monitoring of acute rheumatic fever. It can effectively detect changes in the heart and joints and rule out serious complications, but its ability to visualize soft tissues is limited. Radiography can be a useful adjunct to more sophisticated imaging techniques such as echocardiography and MRI.

The study confirmed that radiography can be useful for the initial diagnosis and monitoring of patients with acute rheumatic fever, but more advanced imaging techniques are needed to more accurately assess the condition of the heart and joints.

In the future, further research in this area is needed to optimize imaging methods and improve diagnostic quality. It is recommended to integrate radiography into standard clinical protocols for patients with acute rheumatic fever, which will allow timely response to changes and improve treatment approaches.

Thus, radiography is an indispensable tool in the arsenal of medical workers, allowing not only to diagnose acute rheumatic fever, but also to monitor its dynamics, which ultimately helps to improve the quality of life of patients and reduce the incidence of disease.

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