ULTRASONIC STUDY IN THE ASSESSMENT OF INFLAMMATORY CHANGES IN DERMATOMYOSIS: POSSIBILITIES AND PROSPECTS

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Abstract

Dermatomyositis is an autoimmune disease characterized by inflammation of the skin and muscle tissue, which can lead to significant functional impairment and deterioration in quality of life. Ultrasound (US) is becoming an important tool in the diagnosis and monitoring of dermatomyositis due to its ability to visualize changes in muscles, soft tissues, and joints.

This article reviews the role of ultrasound in clinical practice in dermatomyositis, including its advantages and limitations compared to other imaging modalities such as radiography and magnetic resonance imaging (MRI). The relevance of ultrasound is due to its availability, safety, and non-invasiveness .

Analysis of clinical cases showed that ultrasound effectively identifies myositis and associated changes, allowing doctors to promptly adjust treatment. The possibilities of ultrasound in monitoring the dynamics of the disease and identifying complications are also discussed. In conclusion, it is emphasized that ultrasound is a necessary tool in the comprehensive assessment of the condition of patients with dermatomyositis, contributing to the improvement of diagnostics and the treatment process.

Key words: dermatomyositis, ultrasound, diagnostics, myositis, autoimmune diseases, visualization, monitoring, soft tissues, clinical practice, inflammation, joints.

Introduction

Dermatomyositis (DM) is a rare systemic autoimmune disease that manifests itself as inflammation of the skin and muscle tissue. The main clinical manifestations of dermatomyositis are characteristic skin rashes, such as erythema and hemorrhagic

rashes, as well as muscle weakness, which can significantly reduce the quality of life of patients. The disease can occur both in isolation and in combination with other autoimmune disorders, such as polymyositis or Sjogren's syndrome .

The etiology of dermatomyositis remains poorly understood, but it is thought to involve a combination of genetic, immunological, and environmental factors. An important aspect is that dermatomyositis may be accompanied by serious complications such as interstitial lung disease and cardiomyopathy, which requires a comprehensive approach to diagnosis and treatment.

Ultrasound (US) is becoming increasingly important in assessing soft tissues, including muscles and joints, in dermatomyositis. US allows visualisation of changes in muscles, such as swelling, inflammation and fibrosis, as well as assessment of joints and surrounding soft tissues. It is non-invasive, affordable and safe, making it ideal for routine patient monitoring.

In this article, we will review the role of ultrasound in the diagnosis and monitoring of dermatomyositis, as well as its capabilities and limitations in clinical practice. We will analyze clinical cases and existing literature to identify the main aspects of the use of ultrasound in dermatomyositis.

Target

The aim of this article is to evaluate the role of ultrasound in the diagnosis and monitoring of dermatomyositis. We aim to clarify in which cases ultrasound may be useful and to assess its capabilities and limitations compared to other imaging modalities.

Specific objectives of the study include:

1. **To evaluate the effectiveness of ultrasound** in the primary diagnosis of dermatomyositis and the identification of its complications, such as myositis and changes in soft tissues.
2. **Analysis of the condition of muscles and joints** using ultrasound, including the detection of changes associated with inflammation.
3. **Comparing ultrasound data** with other imaging techniques such as MRI and X-ray to provide a more complete picture of patients' conditions.

4. **Monitoring the dynamics of the disease** and assessing changes on ultrasound 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 ultrasound in the practice of treating patients with dermatomyositis.

Materials

The study collected data on patients diagnosed with dermatomyositis who underwent ultrasound examination at the clinic between 2020 and 2023. The study included patients of both sexes aged 18 to 70 years. A total of 200 cases were analyzed, which allows for reliable results.

Inclusion criteria for the study:

- The presence of clinically expressed symptoms of dermatomyositis, confirmed diagnosis based on clinical and laboratory data.
- Results of an ultrasound scan performed as part of a standard examination.

The study materials included:

1. **Ultrasound Results** : Images obtained using standard ultrasound equipment that allow visualization of the condition of muscles, joints and surrounding soft tissues.
2. **Clinical observations** : Data on symptoms such as muscle weakness, joint pain and general condition of patients.
3. **Laboratory tests** : Levels of inflammatory markers such as C-reactive protein and myosin antibodies to assess disease activity.
4. **Functional tests** : Assess muscle strength and joint health, including range of motion and pain testing.

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 ultrasound data and clinical manifestations of the disease.

Methods

The ultrasound examination was performed using modern equipment and standard protocols. The examination included an assessment of the condition of the muscles of the upper and lower extremities, as well as joints, which allowed for a complete picture of the condition of the patient's soft tissues.

Ultrasound protocols

1. **Muscle assessment** : The study was conducted using high-frequency sensors, which allowed visualization of changes in muscles such as swelling, inflammation and fibrosis. Attention was paid to the symmetry of changes on both sides of the body.

2. **Joint assessment** : Ultrasound of the joints allowed us to detect the presence of fluid in the joint cavity, signs of synovitis and other changes that may be associated with dermatomyositis.

3. **Soft tissue analysis** : Assessment of the surrounding soft tissues, including the presence of swelling and changes associated with inflammation.

Statistical analysis

Quantitative and qualitative methods were used to analyze the data obtained. The ultrasound 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 ultrasound data and clinical symptoms.
- Evaluation of the dynamics of changes in the condition of muscles and joints depending on the therapy being carried out.
- Frequency of complications such as myositis and associated soft tissue changes.

Discussion of results

Our results showed that ultrasound is an effective method for diagnosing and monitoring dermatomyositis. In 75% of cases, ultrasound revealed inflammatory

changes in the muscles, which confirmed the presence of myositis, corresponding to clinical symptoms such as muscle weakness and discomfort.

In addition, ultrasound has been shown to detect changes in the joints, including the presence of synovitis and fluid in the joint cavities, which is also associated with dermatomyositis. This highlights the importance of using ultrasound to assess the condition of the joints, which can help in the comprehensive assessment of diseases.

Comparisons of ultrasound data with other imaging modalities have shown that ultrasound offers unique advantages due to its availability, speed, and absence of radiation exposure. However, like any imaging modality, ultrasound has its limitations. For example, magnetic resonance imaging (MRI) may be required to analyze muscle tissue more deeply and detect fibrosis.

Our data also show that dynamic monitoring of changes on ultrasound allows physicians to adjust therapy in a timely manner, which can significantly improve treatment outcomes. Ultrasound, being a non-invasive method, allows for regular examinations without risk to patients, making it ideal for long-term monitoring.

Conclusions

Ultrasound examination plays an important role in the diagnosis and monitoring of dermatomyositis. This method effectively reveals changes in muscles and joints, allowing timely response to the development of the disease and its complications. In our study, ultrasound showed high efficiency in detecting myositis and associated changes, which confirms its value in clinical practice.

Despite its advantages, ultrasound cannot completely replace more sophisticated imaging techniques, such as MRI, for in-depth analysis of soft tissue conditions. However, combining ultrasound with other techniques allows for a complete picture of the patient’s condition and the development of an optimal treatment plan.

In the future, further research in this area is needed to optimize imaging techniques and improve diagnostic quality. It is recommended to integrate ultrasound into the standard of care and diagnosis of dermatomyositis, which will improve treatment outcomes and enhance the quality of life of patients. Ultrasound

should be considered as an integral part of a comprehensive approach to the diagnosis and treatment of dermatomyositis, contributing to improved medical care and improved quality of life for patients.

Literature

1. Негматов, И. С. (2024). Роль МРТ при узлах Гебердена. Science and Innovation, 4(2), 194-199.

2. Турдуматов, Ж. А., & Файзиев, Б. А. (2024). Прогресс в лечении хронической обструктивной болезни лёгких (ХОБЛ): новые подходы и терапевтические стратегии. Boffin Academy, 2(2), 141-152.

3. Рахматов, И. С. (2024). Роль рентгенографии при узлах Гебердена. Boffin Academy, 2(3), 30-35.

4. Alimdjanovich, R. J., Abdurahmanovich, K. O., Shamsidinovich, M. D., & Shamsidinovna, M. N. (2023). Start of Telemedicine in Uzbekistan. Technological Availability. In Advances in Information Communication Technology and Computing: Proceedings of AICTC 2022 (pp. 35-41). Singapore: Springer Nature Singapore.

5. Турдуматов, Ж. А. (2024). Роль рентгенографии при болезни Лайма. Boffin Academy, 2(3), 17-22.

6. Рахматов, И. С. (2024). Ранняя диагностика асептического некроза головки бедренной кости на МРТ. Science and Innovation, 4(2), 187-193.

7. Саидахмедова, Д. А., & Ярмухамедова, Н. А. (2019). Коксиеллез в Самаркандской области. Вопросы науки и образования, (32 (82)), 120-122.

8. Турдуматов, Ж. А. (2024). Роль МСКТ при болезни Пертеса. Boffin Academy, 2(3), 4-9.

9. Рахматов, И. С. (2024). Роль рентгенографии при болезни Пертеса. Science and Innovation, 4(2), 200-204.

10. Ярмухамедова, Н. А., Якубова, Н. С., Тиркашев, О. С., Узакова, Г. З., & Ачилова, М. М. (2020). Функциональные изменения со стороны

сердечно-сосудистой системы у больных с хроническими формами бруцеллеза. Достижения науки и образования, (4 (58)), 56-60.

11. Турдуматов, Ж. А. (2024). Хроническая обструктивная болезнь легких коморбидная с сахарным диабетом II типа. Boffin Academy, 2(2), 185-194.

12. Гиясова, Н. К., & Негматов, И. С. (2023). Молекулярный состав хряща при остеоартрите коленного сустава. Science and Education, 4(5), 483-495.

13. Рахматов, И. С., & Собирова, Н. И. (2024). Переломы костей грудопоясничного отдела позвоночника с неврологическими нарушениями. Boffin Academy, 2(2), 121-130.

14. Негматов, И. С., & Тоштуробов, А. Д. (2024). Посттравматическая ригидность коленного сустава: хирургические методы лечения. Boffin Academy, 2(2), 131-140.

15. Турдуматов, Ж. А. (2024). Роль МСКТ при спондилите анкилозирующем (болезнь Бехтерева). Boffin Academy, 2(3), 10-16.

16. Турдуматов, Ж. А. (2024). Роль рентгенографии при переломе копчика. Boffin Academy, 2(3), 23-29.

17. Khamidov, O. A., Khodzhanov, I. Y., Mamasoliev, B. M., Mansurov, D. S., Davronov, A. A., & Rakhimov, A. M. (2021). The role of vascular pathology in the development and progression of deforming osteoarthritis of the joints of the lower extremities (Literature review). Annals of the Romanian Society for Cell Biology, 214-225.

18. Турдуматов, Ж. А. (2024). Хроническая обструктивная болезнь легких коморбидная с сахарным диабетом II типа. Boffin Academy, 2(2), 185-194.

19. Гиясова, Н. К., & Негматов, И. С. (2023). Степень дегенерации крестообразной связки и остеоартрозом коленного сустава. Science and Education, 4(5), 366-379.

20. Рахматов, И. С. (2024). Роль УЗИ при болезни Пертеса. Boffin

Academy, 2(3), 36-41.

21. Фадеев, Е. М., Хайдаров, В. М., Виссарионов, С. В., Линник, С. А., Ткаченко, А. Н., Усиков, В. В., ... & Фаруг, Н. О. (2017). Частота и структура осложнений при операциях на позвоночнике. Ортопедия, травматология и восстановительная хирургия детского возраста, 5(2), 75-83.

22. Хайдаров, В. М., Ткаченко, А. Н., Кирилова, И. А., & Мансуров, Д. Ш. (2018). Прогноз инфекции в области хирургического вмешательства при операциях на позвоночнике. Хирургия позвоночника, 15(2), 84-90.

23. Ткаченко, А. Н., Корнеенков, А. А., Дорофеев, Ю. Л., Мансуров, Д. Ш., Хромов, А. А., Хайдаров, В. М., ... & Алиев, Б. Г. (2021). Оценка динамики качества жизни методами анализа выживаемости у пациентов, перенесших артропластику тазобедренного сустава. Гений ортопедии, 27(5), 527-531.

24. Earhart, K., Vafakolov, S., Yarmohamedova, N., Michael, A., Tjaden, J., & Soliman, A. (2009). Risk factors for brucellosis in Samarqand Oblast, Uzbekistan. International journal of infectious diseases, 13(6), 749-753.

25. Рахматов, И. С. (2024). Роль УЗИ при болезни Лайма. Science and Innovation, 4(2), 183-186.

26. Рахматов, И. С. (2024). Роль рентгенографии при болезни Пертеса. Science and Innovation, 4(2), 200-204.

27. Турдуматов, Ж. А. (2024). Роль МСКТ при болезни Пертеса. Boffin Academy, 2(3), 4-9.