Annals of Clinical and Medical Case Reports

Research Article

ISSN 2639-8109 | Volume 13

Clinical Presentation and Diagnosis of Rheumatoid Arthritis

Shah P[1], Trivedi J[2*] and Shah P[1]

[1]Junior Resident, India

[2]Medical superintendent and professor of Medicine at Sal Hospital and Research Center, India

[*]Corresponding author:

Jayesh Trivedi,
Medical superintendent and professor of Medicine at Sal Hospital and Research Center, Ahmedabad, Gujarat, India

Received: 06 Apr 2024
Accepted: 23 May 2024
Published: 28 May 2024
J Short Name: ACMCR

Citation:

Trivedi J,Clinical Presentation and Diagnosis of Rheumatoid Arthritis. Ann Clin Med Case Rep. 2024; V13(18): 1-7

Keywords:

Rheumatoid arthritis; Anticyclic citrullinated peptide

1. Abstract

Rheumatoid arthritis (RA) is a systemic autoimmune disorder characterized by chronic inflammation, primarily affecting the synovial joints but also associated with numerous extra-articular manifestations. This comprehensive review delineates the multifaceted nature of RA, highlighting its clinical presentation, diagnostic criteria, imaging techniques, and the significance of physical examination in disease management. RA often presents with symmetric joint involvement that progresses from the small joints of the hands and feet to larger axial joints, accompanied by morning stiffness and systemic symptoms such as fatigue and fever. The pathogenesis involves autoimmunity where both genetic and environmental factors play crucial roles. Diagnosis is primarily clinical, supported by imaging modalities like X-ray, MRI, and ultrasound, which help detect joint erosions and synovitis at early stages. Laboratory tests including the rheumatoid factor (RF) and anticyclic citrullinated peptide (anti-CCP) antibodies are pivotal for diagnosis, while C-reactive protein (CRP) levels serve to assess inflammation and disease activity. The article emphasizes the critical role of physical examination in evaluating musculoskeletal manifestations and guiding treatment decisions, underscoring the personalized nature of managing RA. Advanced imaging techniques and detailed clinical assessments facilitate early diagnosis and timely therapeutic intervention, which are essential for preventing joint destruction and managing the systemic implications of the disease. The review advocates for an integrated diagnostic approach combining patient history, clinical examination, targeted laboratory tests, and appropriate imaging to optimize the management and improve the prognosis of patients with RA.

2. Introduction

Rheumatoid arthritis (RA) is a chronic inflammatory condition of unknown origin, primarily targeting synovial-lined joints.

It typically manifests in a symmetrical fashion, causing erosion of bone and cartilage that can lead to joint deformities if left uncontrolled.

Without timely and effective intervention, the condition can significantly impair mobility, usually advancing from smaller joints at the body's extremities to larger central joints over a period of 10 to 20 years.

3. Initial Clinical Presentation

Rheumatoid arthritis (RA) usually emerges as a disease affecting multiple joints, often beginning gradually. Nevertheless, some individuals may experience a sudden onset, with symptoms that either come and go or move from one joint to another, or they may present with the disease affecting only one joint. The condition's symptoms can severely limit patients' daily activities, such as walking, climbing stairs, and dressing, using the restroom, rising from a chair, opening containers, and typing, along with their professional capabilities. Additionally, systemic symptoms like significant muscle pain, fatigue, mild fever, weight loss, and depression can occur in up to a third of patients experiencing a sudden start of polyarthritis. Less commonly, patients might also exhibit symptoms outside of the joints, including nodules or inflammation of the eye [4].

4. Articular Manifestations (4)

Based on the detailed information provided, here's a summary of the classic, palindromic, and monoarthritis variants of rheumatoid arthritis (RA):

Classic Rheumatoid Arthritis (RA): This form of RA typically begins insidiously, primarily characterized by pain, stiffness (notably morning stiffness lasting more than one hour), and swelling of multiple joints. Early disease commonly affects the metacarpophalangeal (MCP) and proximal interphalangeal (PIP) joints, thumbs, wrists, and metatarsophalangeal (MTP) joints of the toes. It can progressively involve other synovial joints, impacting daily living activities and leading to potential disability.

Palindromic Rheumatism: A subset of patients experiences RA onset episodically, marked by episodes affecting one to several joints for hours to days, interspersed with symptom-free periods. This pattern, known as palindromic rheumatism, shares genetic risk factors with more typical RA presentations and exhibits a similar effect from certain human leukocyte antigen (HLA) alleles. Studies show variable progression from palindromic rheumatism to RA, with a significant proportion developing RA over time. The role of anti-citrullinated peptide/protein antibodies (ACPA) in predicting progression to RA has been explored, with mixed evidence. Treatment with hydroxychloroquine may reduce the risk of progression to RA.

Monoarthritis: RA may also present as persistent arthritis affecting a single joint, often a large joint such as the wrist, knee, shoulder, hip, or ankle. This manifestation can either be the sole presentation of RA or herald the onset of polyarticular disease. The approach to patients with monoarthritis remains generic until the development of polyarthritis.

These variants highlight the diverse clinical presentation and progression patterns of RA, emphasizing the need for a personalized approach to diagnosis and management.

5. Distribution of Joint Involvement in Rheumatoid Arthritis (4)

In Rheumatoid Arthritis (RA), peripheral joints are affected in nearly all cases over time. However, involvement of the axial and central joints happens less frequently, seen in 20 to 50 percent of patients. These less commonly affected joints include the necks interfacetal and atlantoaxial joints, as well as the acromioclavicular, sternoclavicular, temporomandibular, and cricoarytenoid joints, in addition to the shoulders and hips. While lumbar spine facet joint synovitis can occur, it is considered rare.

5.1. Hand Involvement in RA

Early RA often presents in the hands with symmetrical swelling and stiffness in the MCP and PIP joints, leading to tenderness, limited movement, and reduced grip strength. Palmar erythema and thickening of the flexor tendons due to tenosynovitis might also be observed, occasionally causing "trigger finger" or tendon rupture.

5.2. Wrist Involvement in RA

The wrists are commonly affected early in RA, with patients experiencing a loss of extension. Advanced stages may show volar subluxation and radial drift of the carpus, along with potential tendon rupture.

5.3. Elbow Involvement in RA

Frequently involved, the elbow may exhibit loss of extension early on and, over time, synovitis that can lead to ulnar nerve compression and olecranon bursitis. Rheumatoid nodules often develop at this site.

5.4. Shoulder Involvement in RA

Shoulders are typically affected later in RA, with erosion leading to pain, movement restriction, and "frozen shoulder" symptoms. Night pain when lying on the affected side and rotator cuff injuries are common.

5.5. Foot and Ankle Involvement in RA

Early RA often affects the MTP joints, mirroring hand involvement. Patients may experience marked tenderness, leading to changes in weight-bearing and gait. Tarsus involvement, retrocalcaneal bursitis, and tarsal tunnel syndrome can cause significant pain and edema.

5.6. Knee Involvement in RA

The knee commonly shows synovial thickening and effusion, restricting movement. Ligamentous laxity and muscle atrophy can lead to deformities, with erosive damage potentially resulting in genu varus or genu valgus. Popliteal cysts, or Baker's cysts, may develop, sometimes mimicking deep vein thrombosis.

5.7. Hip Involvement in RA

Hip disease usually indicates advanced RA, manifesting as pain in the groin, thigh, or low back, often referred to the knee. Movement restriction and trochanteric bursitis can also occur, affecting mobility and comfort.

6. Spine Involvement

In RA, the cervical spine is often affected, particularly in cases of long- term disease, unlike the thoracolumbar spine or sacroiliac joints, which are seldom involved. Neck pain and stiffness are the primary symptoms, but long-standing disease in the cervical spine can lead to instability, causing symptoms like neck discomfort, stiffness, and radicular pain due to subluxation. If subluxation leads to spinal cord compression, signs of neurological involvement such as increased reflexes or positive Babinski sign may be observed. The symptoms, diagnostic process, and management strategies for cervical spine subluxation in RA are thoroughly discussed in specialized sections.

7. Extraarticular Manifestations of Rheumatoid Arthritis (5)

7.1. Skin Manifestations

- Rheumatoid nodules are firm, non-tender subcutaneous nodules that occur in around 20% of RA patients. They typically develop over bony prominences like the elbow, occiput, and olecranon process due to repeated microtrauma. Histologically they show a necrotic center surrounded by palisading histiocytes, fibrinoid necrosis, and proliferating fibroblasts and blood vessels - features resembling rheumatoid synovitis.

- Rheumatoid vasculitis skin lesions result from inflammation and necrosis of small/medium blood vessels. This can manifest as splinter hemorrhages, periungual infarcts, digital pulp gangrene, livedo reticularis, and painful nodular leg ulcers.

- Pyoderma gangrenosum - chronic, recurrent ulcerative skin lesions with violaceous undermined borders can also rarely occur, often on the lower extremities. It is a neutrophilic dermatosis of unknown etiology associated with systemic diseases like RA.

7.2. Ocular Manifestations

- Keratoconjunctivitis sicca (dry eyes due to decreased tear production) occurs in at least 10% of RA cases, often along with dry mouth/xerostomia as part of secondary Sjogren's syndrome.

- Episcleritis (inflammation of the episcleral tissue) occurs in <1% of cases and is generally benign and self-limiting.

- The more severe scleritis involves the deeper scleral tissues. It can lead to peripheral ulcerative keratitis with potential corneal melt and vision loss if not treated promptly.

- Retinal vasculitis, sclerotic central retinal vein occlusions, and ischemic optic neuropathy are rare but sight-threatening complications.

7.3. Oral Manifestations

- Xerostomia (dry mouth due to decreased saliva production) and salivary gland swelling/dysfunction are common in RA, especially in those with secondary Sjogren's syndrome.

- Increased risk of tooth loss, periapical abscesses, candidiasis, and difficulty swallowing due to hyposalivation.

7.4. Gastrointestinal Manifestations

- Intestinal vasculitis leading to acute abdominal pain, bleeding, perforation, and bowel infarction is very rare (<1% of cases), not directly related to arthritis activity. It is associated with high rheumatoid factor levels, subcutaneous nodules, and rheumatoid vasculitis elsewhere.

- Prognosis is poor with bowel perforation having a high mortality rate.

- More common are medication-related GI issues like NSAID-induced ulcers and proton pump inhibitor use causing vitamin B12 deficiency.

7.5. Pulmonary Manifestations

- Pleurisy with exudative effusions rich in low glucose, high protein, and high numbers of nucleated cells including rheumatoid necrobiotic cells is frequently seen, though often asymptomatic.

- Interstitial lung disease (ILD) like usual interstitial pneumonia (UIP) and non-specific interstitial pneumonia (NSIP) patterns occur more commonly in male RA patients with long-standing, nodular, rheumatoid factor positive disease. It can lead to pulmonary fibrosis.

Rheumatoid nodules can form in the lungs, often cavitating, causing pneumothorax, hemoptysis and lung abscess/cavitation.

- Other manifestations include bronchiectasis, bronchiolitis, respiratory bronchiolitis-associated ILD, and opportunistic infections.

7.6. Cardiac Manifestations

- Pericarditis is the most common cardiac manifestation, often asymptomatic but can present with chest pain, fever, friction rub. Pericardial fluid is exudative resembling pleuritic fluid.

- Myocarditis with granulomatous nodules involving the myocardium can occur, leading to arrhythmias, heart block, dilated cardiomyopathy and heart failure.

- Rheumatoid granulomatous nodules can also develop on the cardiac valves, especially the aortic and mitral, causing regurgitation and stenosis.

- Accelerated coronary atherosclerosis, myocardial infarctions and cardiomyopathy increase cardiovascular disease risk in RA patients.

- Diastolic dysfunction and reduced aortic distensibility are also commonly seen.

7.7. Renal Manifestations

- RA-associated glomerulonephritis is uncommon in the absence of systemic rheumatoid vasculitis. Mesangial glomerulonephritis is most frequent, often subclinical.

- Amyloidosis causing nephrotic syndrome can also occur with long- standing RA, though rarely.

- Most renal issues are medication-related like NSAID nephropathy, crystal nephropathy from disease-modifying drugs, etc.

7.8. Neurological Manifestations

- Rheumatoid vasculitis can affect the vasa nervosum causing mononeuritis multiplex or distal symmetric sensorimotor neuropathy.

- Cervical myelopathy and spinal cord compression from subluxation at the craniovertebral junction or pannus formation is a serious complication of long-standing, erosive RA.

- Entrapment neuropathies at common sites of compression can also occur due to synovial proliferation and cyst formation.

7.9. Hematological Manifestations

- Anemia of chronic disease is one of the most common extraar-

ticular features, correlating with high disease activity. It is typically normocytic, normochromic anemia with low serum iron, ferritin and transferrin.

Thrombocytosis is frequently seen during active arthritis flares, likely due to increased levels of IL-6 and thrombopoietin.

- Felty's syndrome - the triad of rheumatoid arthritis, neutropenia and splenomegaly is an uncommon but severe manifestation.

- Leukocytosis with eosinophilia may indicate active disease, vasculitis or reaction to medications.

- Benign lymphoid hyperplasia with reactive lymphadenopathy can be seen.

- Increased risk of hematological malignancies like lymphoma and leukemia, likely from chronic immune dysregulation.

The extraarticular manifestations are more likely to occur in patients with high rheumatoid factor and anti-CCP antibody levels, HLA-DR4 genotype, high inflammatory markers like CRP/ESR, and longstanding erosive joint disease. Early initiation of aggressive disease-modifying therapy may help prevent some of these systemic complications.

8. Importance of Physical xam in ra (6)

According to one survey by Castrejon et al. (2012), physicians' opinions were obtained regarding the relative importance of different components of the clinical encounter - vital signs, patient history, physical examination, laboratory tests, and ancillary studies - in the diagnosis and management of eight chronic diseases, including rheumatoid arthritis (RA). The internetbased survey was emailed to 7,265 U.S. physicians, comprising 3,542 rheumatologists and 3,723 non-rheumatologists. Responses from 313 physicians (154 rheumatologists and 159 non-rheumatologists) were analyzed.

The survey found that over 70% of rheumatologists estimated the physical examination as the most important component for diagnosing rheumatoid arthritis, and 80% estimated it as most important for managing RA.

This was a much higher percentage than non-rheumatologists, where only 55% rated the physical exam as most important for RA diagnosis and 50% for RA management.

In contrast, for diseases like diabetes and hypercholesterolemia where lab tests are the main diagnostic criteria, over 95% of all physicians rated lab tests as the most important component.

So in summary, this study suggests the physical exam is considered exceptionally important for RA compared to other diseases, likely due to the central role of thoroughly evaluating musculoskeletal manifestations through direct inspection and palpation by the rheumatologist. This aligns with the view that RA care is highly clinician-intensive.

9. Physical Examination Findings in Rheumatoid Arthritis [4]

During the initial stages of rheumatoid arthritis, the primary manifestations observed are joint pain and swelling. Pain manifests through tenderness when pressure is applied directly to the joint or when the joint is moved. Swelling can stem from either synovial membrane thickening or fluid accumulation, with synovial thickening giving the joint a spongy texture and effusion making the swelling feel fluctuant. Although not typically marked by heat and redness, an affected joint may exhibit a slight increase in temperature upon detailed examination. Early disease may also lead to symptoms of carpal tunnel syndrome, particularly in cases of wrist synovitis, even before significant swelling becomes apparent. Characteristic deformities in the joints emerge as later disease developments, consequent to the cumulative effects of physical strain and structural damage within the affected joints.

10. Diagnosis of Rheumatoid Arthritis Overview (7)

Rheumatoid arthritis (RA) diagnosis involves a multifaceted approach encompassing clinical symptomatology, physical examination, evaluation of risk factors and familial predisposition, utilization of imaging modalities such as ultrasound sonography, and analysis of pertinent laboratory markers. Patients typically manifest tender, swollen joints in a symmetric distribution, accompanied by prolonged morning stiffness and systemic symptoms like fatigue. Physicians conduct thorough physical examinations to assess joint inflammation and structural abnormalities, considering factors such as genetics, smoking history, and obesity. Additionally, imaging techniques like ultrasound aid in visualizing joint pathology. Laboratory tests, including measurement of CRP and ESR levels, serve to gauge systemic inflammation, while detection of RA-specific autoantibodies such as rheumatoid factor and anti-cyclic citrullinated peptide antibodies further supports the diagnostic process. Integration of these diagnostic components facilitates early and accurate identification of RA, enabling timely initiation of therapeutic interventions aimed at disease control and prevention of irreversible joint damage.

11. Eular Criteria

The 2020 ACR-EULAR criteria, originally designed for selecting specific patient groups in RA clinical trials, are also applicable for diagnosing RA in clinical practice. These criteria encompass various diagnostic elements, including joint involvement, abnormal CRP and ESR levels, presence of RA-specific autoantibodies, and symptom duration (Table 1).

Table 1:

Targetpopulation(whoshouldbe tested?)	
Patient with at least 1 swollen joint with definite clinical synovitis (swelling).* Synovitis is not better explained by another disease. *Differential diagnoses differ in patients with different presentations but may include conditions such as systemic lupus erythematosus, psoriatic arthritis and gout. If unclear about the relevant differentials, an expert rheumatologist should be consulted.	
Classification criteria for RA (Score-based algorithm: add score of categories A-D) A score of ≥ 6/10 is needed for a definite classification of a patient with RA.	
Joint involvementA	
1 largeB joint	0
2-10 large joints	1
1-3 smallC joints (with or without involvement of large joints)	2
4-10 small joints (with or without involvement of large joints)	3
>10 jointsD (at least one small joint)	5
SerologyE (at least one test result is needed for classification)	
Negative RF **and** negative ACPA	0
Low positive RF **or** low positive ACPA	2
High positive RF **or** high positive ACPA	3
ACUTE PHASE REACTANTSF (at least one test result is needed for classification)	
Normal CRP **and** normal ESR	0
Abnormal CRP **or** abnormal ESR	1
Duration of symptomsG	
< 6 weeks	0
≥ 6 weeks	1

AJoint involvement refers to any swollen or tender joint on examination, which may be confirmed by imaging evidence of synovitis. Distal interphalangeal joints (DIPs), 1st carpometacarpal (CMC) joint and 1st metatarso-phalangeal (MTP) joint are excluded from assessment. Categories of joint distribution are classified according to the location and number of the involved joints, with placement into the highest category possible based on the pattern of joint involvement.

BLarge joints refer to shoulders, elbows, hips, knees and ankles.

CSmall joints refer to the wrists, metacarpo-phalangeal (MCP) joints, proximal interphalangeal (PIP) joints, thumb interphalangeal (IP) joints and metatarsophalangeal (MTP).

DIn this category, at least 1 of the involved joints must be a small joint; the other joints can include any combination of large and additional small joints, as well as other joints not specifically listed elsewhere (e.g. temperomandibular, acromioclavicular and sternoclavicular joints).

ENegative refers to international unit (IU) values that are £ upper limit of normal ULN for the lab and assay. Low titre refers to IU values that are > ULN but £ 3X

ULN for lab and assay. High titre positive: > 3X ULN for lab and assay. Where RF is only available as positive or negative, a positive results should be scored as 'low positive' for RF.

FNormal /abnormal is determined by local laboratory standards (Other causes for elevated acute phase reactants should be excluded).

GDuration of symptoms refers to patient self-report of the duration of signsor symptoms of synovitis (e.g., pain, swelling, tenderness) of joints that are clinically involved at the time of assessment, regardless of treatment status.

RF = rheumatoid factor; ACPA = anti-citrullinated protein/ peptide antibodies; ULN = upper limit of normal; ESR = erythrocyte sedimentation rate; CRP = C-reactive protein.

12. Autoantibodies (8)

1. Antinuclear antibody (ANA) testing is commonly used, but the results are non-specific and must be interpreted in the context of clinical presentation and antibody titer. ANA positivity is seen in a variety of autoimmune conditions, not just systemic lupus erythematosus (SLE).

2. Specific autoantibody testing for extractable nuclear antigens (e.g. anti-dsDNA, anti-Ro/SSA, anti-Scl-70) is preferred when differentiating between different autoimmune disorders.

3. Rheumatoid factor (RF) can be present in RA as well as other conditions. High-titer RF (>50 IU/mL) has good specificity (91-96%) but lower sensitivity (45-54%) for RA.

4. Anti-citrullinated peptide antibodies (anti-CCP) testing has emerged as a highly specific (9698%) marker for RA, with sensitivity approaching that of RF. It is useful especially in RFnegative patients.

5. Acute phase reactants like erythrocyte sedimentation rate and C- reactive protein are nonspecific markers of inflammation, but can be used to rule out non-inflammatory conditions and monitor disease activity.

6. Early diagnosis and referral to a rheumatologist for disease-modifying therapy is emphasized, as joint damage can occur within the first 2 years of symptom onset

13. Role of CRP (9)

13.1. Overview of CRP's Role in RA

• CRP serves as a critical indicator of systemic inflammation in RA, significantly influencing the disease's inflammatory processes.

• It impacts RA disease activity, the response to treatments, and is associated with various comorbid conditions like cardiovascular diseases, diabetes, metabolic syndrome, lung diseases, and depression.

13.2. Functions of CRP in RA

• CRP plays a key role in the body's defense mechanisms against infections and in responding to inflammation by promoting the production of proinflammatory cytokines.

• The correlation between CRP levels and tissue inflammation in RA is strong, with a direct relationship to IL-6 levels.

• As an immune system regulator, CRP exists in two forms: pentameric (pCRP) and monomeric

(mCRP), each possessing unique biological actions. Notably, mCRP is involved in proinflammatory processes and can activate a range of cells to foster inflammation and contribute to atherosclerosis.

13.3. Circulating Levels of CRP

• Typically, CRP concentrations below 10 mg/L are considered normal, with elevated levels indicating inflammation. High- sensitivity CRP assays are employed to assess inflammatory conditions more accurately.

• In individuals with RA, CRP levels are frequently found to be elevated, signaling disease activity. Nonetheless, disease activity may still be present even when CRP levels are within the normal range.

13.4. CRP's Biological Impact on RA

• CRP is implicated in the process of bone destruction associated with RA by promoting RANKL expression and osteoclast differentiation.

• Elevated CRP levels correspond with increased disease activity in RA, and CRP measurements are incorporated into several composite disease activity indexes like DAS28-CRP.

13.5. CRP and RA Comorbidities

• RA patients with higher CRP levels face an increased risk of developing comorbidities, particularly cardiovascular diseases. CRP-driven systemic inflammation is a critical contributor to the onset of atherosclerosis.

• Evidence suggests that reducing RA disease activity, which is linked to lower CRP levels, might lessen cardiovascular risk.

13.6. Clinical Considerations

• The measurement of CRP levels offers an accessible and valuable means to evaluate systemic inflammation and predict clinical outcomes in RA.

Successful RA treatment typically results in a reduction in CRP levels, although the extent of this decrease varies with the treatment approach.

14. Imaging

Imaging plays a crucial role in identifying the typical manifestations of rheumatoid arthritis (RA), such as joint space narrowing and bony erosions. These are most effectively seen on X-ray images of the hands and feet. Such findings may be observable at the patient's first medical consultation, but they are more commonly revealed as the disease progresses, particularly after the initial months due to persistent synovitis. While these erosive damages to bone and cartilage are key indicators of RA, it's important to note that similar signs can appear in various other inflammatory arthropathies and gout, making them not exclusively indicative of RA.

Magnetic resonance imaging (MRI) and ultrasound are recognized for their greater sensitivity compared to X-rays in detecting synovitis- induced alterations. Ongoing research aims to elucidate the prognostic significance of MRI and ultrasound findings that do not appear in X- rays.

15. Xray Imaging (4)

Plain X-ray imaging captures the advancing radiographic alterations in joints impacted by ongoing rheumatoid arthritis activity. These changes include reduced bone density near joints, narrowing of the joint space, and the development of bone erosions. As the disease progresses, deformities such as joint dislocation and subsequent degenerative modifications may occur. Early in the disease, Xrays are often normal, with initial signs possibly limited to swelling of soft tissues and decreased bone density around the joints. For erosions to be visible on X-rays, they must penetrate the bone's cortical layer at the joint edges. In the first year of the disease, erosions at the metacarpophalangeal (MCP) and proximal interphalangeal (PIP) joints are detectable in 15 to 30 percent of patients through plain radiography. If the disease is unresponsive to treatment, by the end of the second year, nearly 90 percent of patients may show erosions.

Erosions may initially appear in areas like the ulnar styloid or metatarsophalangeal (MTP) joints in some individuals. There may also be evidence of joint space narrowing. In early RA cases, radiographic signs of joint damage are often more pronounced in the

dominant hand compared to the non-dominant one. This asymmetry in joint damage is also observed in individuals with hemiplegia. In cases of severe destruction, the extent of erosions may become so advanced that radiography cannot further track progression, despite continued joint deterioration.

16. MRI (4)

MRI surpasses plain radiography in its ability to detect bone erosions, though the clinical impact of erosions identified solely by MRI is still to be determined. In a study comparing MRI to radiography among 55 patients with early-stage arthritis, MRI was able to reveal seven times more erosions in the MCP and PIP joints than could be seen with radiography. Additionally, MRI has the potential to uncover bone erosions earlier in the disease's progression than plain radiographs. For instance, around 45 percent of patients who had symptoms for just four months showed erosions via MRI. Bone marrow edema, indicated by reduced signal in T1-weighted images and enhanced with gadolinium, on MRI forecasts the future onset of erosive disease. This heightened sensitivity of MRI for detecting early rheumatoid arthritis is also evident in the forefoot. MRI can also be used to detect and quantify swollen synovial tissue, with MRI- observed synovial growth being linked to subsequent bone erosion development. The advent of MRI machines specifically designed for extremity imaging may accelerate the use of this imaging method beyond research contexts, although the clinical reasons for employing such technology are yet to be fully established.

17. USG (10)

- MSUS is increasingly favored by rheumatologists for joint assessment in RA due to its non-invasive nature, lack of radiation, and convenience in a clinical setting. Despite its operator dependency and reproducibility concerns, the utilization of consensus-based scoring systems and standardized definitions for joint inflammation in RA enhances its reliability as a measurement tool.

17.1. Key MSUS Findings in RA

- MSUS is pivotal for identifying synovial proliferation and active inflammation via Power Doppler (PD), predicting joint damage progression. Consensus-derived definitions for US-related pathologies by the Outcomes Measures in Rheumatology Clinical Trials (OMERACT) Ultrasound Task Force have standardized the assessment of RA joint pathologies.

17.2. Detection of Ultrasound Joint Pathologies

- Synovial hypertrophy and synovial fluid are identified based on their echogenicity and compressibility, with MSUS being superior for examining joint effusions. Recent advancements include Superb Microvascular Imaging (SMI) for more detailed vascularity information.

17.3. Scoring Systems for Ultrasound Pathologies

- Various scoring systems have been developed to standardize the measurement of US-detected pathologies. The German 7-joint US score and the 12-joint assessment are notable for their validity in evaluating synovitis in RA.

17.4. Ultrasound in RA Diagnosis and Prognosis

- MSUS plays a crucial role in the early diagnosis of RA, with PD findings particularly associated with the risk of developing clinical synovitis. Studies have demonstrated its utility in distinguishing RA from other types of arthritis and predicting radiographic progression.

17.5. Subclinical Synovitis and Disease Monitoring

Subclinical synovitis detected by MSUS in patients in clinical remission can predict flare-ups and radiographic progression. While recent RCTs have explored MSUS as a monitoring tool to guide treatment, the results suggest further evaluation is needed to determine its routine use in clinical practice.

References

1. Venables P, Maini R. Clinical manifestations of rheumatoid arthritis. Obtenido. 2016; 26.
2. Cojocaru M, Cojocaru IM, Silosi I, Vrabie CD, Tanasescu R. Extraarticular manifestations in rheumatoid arthritis. Maedica. 2010; 5(4): 286.
3. Castrejón I, McCollum L, Tanriover MD, Pincus T. Importance of patient history and physical examination in rheumatoid arthritis compared to other chronic diseases: results of a physician survey. Arthritis care & research. 2012; 64(8): 1250-5.
4. Aletaha D, Smolen JS. Diagnosis and management of rheumatoid arthritis: a review. Jama. 2018; 320(13): 1360-72.
5. Farng E, Friedrich JB. Laboratory diagnosis of rheumatoid arthritis. Journal of Hand Surgery. 2011; 36(5): 926-7.
6. Pope JE, Choy EH, editors. C-reactive protein and implications in rheumatoid arthritis and associated comorbidities. Seminars in arthritis and rheumatism; 2021; 51(1): 219-29.
7. Elangovan S, Tan YK. The role of musculoskeletal ultrasound imaging in rheumatoid arthritis. Ultrasound in Medicine & Biology. 2020; 46(8): 1841-53.