Review article

Classification of shoulder diseases in older adult patients: a narrative review

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Running title: Shoulder diseases in older adult patients

Abstract

This review classifies and summarizes the major shoulder diseases affecting older adults, focusing on rotator cuff disease, frozen shoulder, osteoarthritis, and shoulder instability. It explores each condition's pathophysiology, risk factors, clinical presentation, diagnostic approaches, and treatment strategies to guide clinicians in optimizing patient outcomes and enhancing quality of life. Age-related degenerative changes, comorbidities, and distinct etiological factors contribute to the presentation of shoulder disorders in older adults. Rotator cuff disease ranges from tendinopathy to full-thickness tears and is influenced by genetic predispositions, inflammatory cytokines, and muscle quality. Frozen shoulder results from fibroproliferative changes in the capsule, leading to significant pain and restricted motion. Osteoarthritis involves cartilage degeneration and bony remodeling, often necessitating surgical interventions such as arthroplasty. Shoulder instability, though less frequent, is complicated by associated injuries like rotator cuff tears and fractures, requiring tailored management strategies. Advances in imaging techniques, biologic treatments, and surgical procedures, particularly arthroscopic and arthroplasty options, have improved diagnostic accuracy and therapeutic outcomes. A thorough classification of shoulder diseases in older adult patients highlights the complexity of managing these conditions. Effective treatment requires individualized approaches that integrate

conservative measures with emerging biologic or surgical therapies. Future research should focus on targeted interventions, standardized diagnostic criteria, and multidisciplinary collaboration to minimize disability, optimize function, and improve overall quality of life in this growing patient population. Multimodal strategies, including patient education, structured rehabilitation, and psychosocial support, further enhance long-term adherence and outcomes. Ongoing vigilance for comorbidities, such as osteoporosis or metabolic disorders, is necessary for comprehensive care.

Keywords: Bursitis; Osteoarthritis; Pain; Rotator cuff injuries; Shoulder

Introduction

Background

The shoulder joint is crucial for performing daily activities and maintaining independence, especially among older adults. Its extensive range of motion renders it vulnerable to injuries and degenerative diseases, which are more common as people age [1]. Aging leads to structural changes in the musculoskeletal system, including decreased bone density, reduced tendon elasticity, and diminished joint lubrication [2]. These factors predispose older adults to conditions such as rotator cuff tears, osteoarthritis, frozen shoulder, and instability [1,3,4].

Objectives

This review aims to provide a detailed classification of shoulder diseases, focusing on their pathophysiology, risk factors, clinical presentation, diagnostic approaches, and treatment strategies. By tailoring management to the specific needs of older adult patients, clinicians can improve outcomes and enhance the quality of life for this vulnerable population.

Ethics statement

As this study is a literature review, it did not require approval from the institutional review board or individual consent.

Rotator cuff diseases

Rotator cuff diseases are a common condition affecting the upper extremity, with manifestations

ranging from mild tendinopathy to full-thickness tears accompanied by arthritis [2-4]. These injuries compromise the functionality of the shoulder, leading to pain, restricted mobility, and weakness [5]. The rotator cuff consists of four muscles—the supraspinatus, infraspinatus, subscapularis, and teres minor—which stabilize the shoulder and enable movement. Rotator cuff tears often occur due to a combination of traumatic events and degenerative changes, particularly affecting the supraspinatus tendon, which is especially susceptible due to its hypovascular nature.

The epidemiology of rotator cuff tears shows that their prevalence increases with age. Research indicates a strong correlation between aging and the development of these tears, with about 62% of individuals over the age of 80 experiencing such injuries [6]. Genetics also contribute to the risk, as familial predispositions and genetic markers associated with inflammation and tissue remodeling can heighten susceptibility. Additional risk factors are diabetes, obesity, smoking, and repetitive physical activity [7].

The pathophysiology of rotator cuff tears involves a complex interplay among tendon degeneration, inflammation, and muscle quality [7]. Tendon injuries typically start with microtrauma, which leads to tendinopathy and may eventually progress to partial or full-thickness tears. Inflammatory cytokines, including interleukin (IL)-6 and IL-1β, significantly contribute to tendon degeneration. Additionally, muscle atrophy and fatty infiltration are known to adversely affect surgical outcomes and impede tendon healing [8]. Advanced imaging techniques, such as magnetic resonance imaging (MRI) and ultrasound, are crucial for diagnosing these conditions by enabling the assessment of tear size, muscle quality, and tendon retraction.

Diagnosis involves a combination of clinical evaluation and imaging. Patients typically present with shoulder pain, especially at night, difficulty performing overhead activities, and weakness [9,10]. Physical examination tests, including the Neer, Jobe, and Hawkins-Kennedy tests, are used to assess muscle strength and functionality. Imaging techniques such as X-rays, MRI, and ultrasound help confirm the diagnosis, assess the size of the tear, and evaluate the quality of the muscle. However, standardizing the diagnostic approach is challenging due to the variability in tear progression and symptoms [10].

Management strategies for rotator cuff tears are customized based on the patient's symptoms, the size of the tear, and their activity levels [9]. Non-operative treatments, which include physical therapy, pharmacotherapy, and corticosteroid injections, prove effective for the majority of patients. Physical therapy aims to restore shoulder mobility, muscle strength, and scapular stability [11]. Pharmacological treatments, such as NSAIDs and corticosteroids, offer short-term relief from pain. Additionally, emerging therapies like platelet-rich plasma (PRP) and mesenchymal stem cell (MSC) injections are

currently under investigation for their potential to promote healing, although their long-term effectiveness is still unclear [12].

Surgical interventions are typically reserved for cases where non-operative treatments are unsuccessful or for patients with acute, traumatic tears [5,9]. Arthroscopic rotator cuff repair is considered the standard surgical method, offering a less invasive option with improved recovery times [13]. However, the rates of retear are still high, especially in patients with poor muscle quality or large tears. Advanced techniques such as double-row suture bridge repair and biologic augmentation with MSCs or PRP are employed to enhance tendon-to-bone healing and reduce the likelihood of retears [14]. In situations involving irreparable tears, alternative strategies like tendon transfer or reverse shoulder arthroplasty might be considered, particularly for older patients [15-17].

The natural history of rotator cuff tears is unpredictable. While many tears remain asymptomatic, others may progress, resulting in increased pain and functional limitations. Factors such as age, tear size, and comorbidities influence the progression of these tears. It is important to note that symptomatic degenerative tears rarely heal on their own and necessitate careful monitoring and management to prevent further complications [18].

Quality of life for individuals with rotator cuff tears can be significantly impacted. Pain, reduced mobility, and sleep disturbances contribute to decreased physical and emotional well-being [19]. Patient education and timely interventions are crucial for improving outcomes and restoring functionality. Future research aims to identify novel therapeutic targets, optimize treatment protocols, and enhance tendon-to-bone healing processes. Rotator cuff tears represent a complex and multifaceted condition, characterized by a broad spectrum of presentations and management options. While non-operative treatments suffice for most patients, advanced surgical techniques and emerging therapies offer hope for improved outcomes in severe cases. Continued research and personalized care approaches are essential for addressing the challenges associated with this condition.

Frozen shoulder

Frozen shoulder, or adhesive capsulitis, is a debilitating condition characterized by pain and a progressive loss of shoulder mobility [20]. It is typically divided into primary and secondary forms; primary cases arise without a clear cause, while secondary cases are linked to trauma, surgery, or underlying medical conditions [21]. The condition generally evolves through three overlapping phases: the painful "freezing" stage, the stiff "frozen" stage, and the "thawing" stage, where gradual improvement occurs [22]. However, many patients continue to experience symptoms beyond these

stages. Frozen shoulder is characterized by fibroproliferative tissue fibrosis, in which fibroblasts and myofibroblasts overproduce collagen. This leads to inflammation, neo-angiogenesis, and capsule contracture, ultimately resulting in restricted shoulder movement and pain [21,22]. The condition most commonly affects individuals in their 50s and has a lifetime prevalence of 2–5%. Risk factors include diabetes, cardiovascular disease, thyroid disorders, autoimmune diseases, obesity, smoking, and low levels of physical activity. Notably, up to 60% of individuals with diabetes may develop frozen shoulder, and the presence of comorbidities such as Dupuytren's disease also increases the risk [20-24].

The pathophysiology of frozen shoulder involves inflammation, vascular and neural changes, and excessive extracellular matrix remodeling [20-22]. Chronic unresolved inflammation is a central feature, with immune cells such as T cells and macrophages playing significant roles. Pro-inflammatory cytokines, including IL-1, IL-6, and transforming growth factor-β, are crucial in promoting fibrosis and inflammation. Fibroblast activation is also key, as these cells produce abnormal amounts of collagen and matrix proteins, which contribute to increased stiffness [25]. Additionally, neural changes, such as heightened nerve sensitivity and an increased expression of pain-related receptors, contribute to the severe pain experienced with this condition, especially at night. Furthermore, advanced glycation end products (AGEs), which are often elevated in individuals with diabetes, exacerbate fibrosis and inflammation by altering tissue remodeling processes [26].

The diagnosis of frozen shoulder primarily relies on clinical assessment, which includes evaluating pain and the restriction of both active and passive shoulder movement. Imaging modalities like X-rays, MRI, and ultrasound are useful for distinguishing this condition from other pathologies, although routine imaging is not always necessary. The lack of standardized diagnostic criteria presents challenges, and differentiating frozen shoulder from other conditions, such as rotator cuff tendinopathy or joint arthrosis, can be difficult in the early stages [21].

Management of frozen shoulder presents a significant challenge, as the condition often resolves spontaneously within 1–2 years. However, symptoms persist in a considerable number of patients [27,28]. Non-operative treatments, which are the initial approach to management, include patient education, physiotherapy, pharmacotherapy, and corticosteroid injections. Patient education is aimed at explaining the natural history of the condition, reducing anxiety, and setting realistic expectations for recovery. Physiotherapy involves mobility exercises that are customized according to the stage of the disease and the severity of pain, incorporating techniques such as stretching and joint mobilization. Nonetheless, the long-term benefits of physiotherapy remain uncertain, and excessive intensity during the inflammatory stage may exacerbate symptoms.

Pharmacological options for treatment include nonsteroidal anti-inflammatory drugs (NSAIDs),

acetaminophen, and corticosteroids. Intra-articular corticosteroid injections have been shown to effectively reduce pain and inflammation in the early stages, although their benefits tend to be short-lived [29]. Alternative interventions, such as injections of sodium hyaluronate, suprascapular nerve blocks, and hydrodilatation (capsular distension with saline or corticosteroids), are promising but still require more research. Hydrodilatation, in particular, is becoming increasingly popular due to its potential to enhance range of motion and alleviate pain. Additionally, emerging therapies like collagenase injections and botulinum toxin are under investigation, with preliminary evidence supporting their effectiveness in certain scenarios [30,31].

For patients who do not respond to non-operative treatments, surgical options are considered. Manipulation under anesthesia (MUA) involves forcibly stretching the joint to break adhesions. In contrast, arthroscopic capsular release (ACR) provides direct visualization and surgical removal of fibrotic tissue. Both methods enhance range of motion and alleviate pain; however, ACR is more invasive and costly. The decision between surgical and non-surgical options is influenced by the severity of the disease, patient preference, and access to healthcare. Research, including the UK FROST trial, indicates that all approaches significantly improve patient outcomes, with ACR showing the most consistent results in refractory cases [32].

Quality of life is significantly impacted by frozen shoulders, which cause severe pain, functional limitations, and sleep disturbances. This condition often leads to anxiety and depression, further exacerbating the overall burden. Patients frequently express frustration over delayed diagnoses and unclear management pathways [33]. These issues underscore the importance of patient-centered care, timely diagnosis, and clear communication regarding treatment options.

Advancements in research are revealing the intricate mechanisms behind frozen shoulder, which include the roles of inflammation, fibrosis, angiogenesis, and neural sensitization. Translational studies are investigating new therapeutic targets, such as anti-inflammatory agents, gene silencing of fibrotic pathways, and alarmin inhibitors [34,35]. Although these emerging therapies are promising, challenges persist in standardizing clinical trials and managing the diverse characteristics of the patient population. Future efforts will focus on developing personalized treatment strategies and incorporating basic science findings into clinical practice.

In conclusion, frozen shoulder is a complex condition that significantly impacts both clinical and psychological aspects of health. Although it is self-limiting, many patients experience prolonged symptoms that disrupt daily activities and overall well-being. Current management strategies primarily aim to control symptoms and enhance functionality. However, there is an urgent need for more effective, evidence-based interventions. Enhancing our knowledge of the disease's pathophysiology

and risk factors is crucial for developing targeted therapies and achieving better outcomes for those affected by this debilitating condition.

Osteoarthritis

Shoulder osteoarthritis is a prevalent chronic condition that significantly impacts quality of life by causing pain and disability [36]. It commonly affects older adults, particularly women and individuals who are obese. The shoulder joint, known for its complex structure and extensive range of motion, ranks as the third most frequent site of musculoskeletal pain, following the lower back and knee. This condition targets the synovial joint, resulting in cartilage degeneration, abnormal bone remodeling, osteophyte formation, and inflammation. The development of osteoarthritis is influenced by both mechanical wear and inflammatory processes, which are driven by cytokines, degradative enzymes, and immune system pathways [37].

The primary contributors to shoulder osteoarthritis include aging, genetic predisposition, and obesity, along with trauma, rotator cuff tears, and joint instability [36,38]. Traumatic injuries, whether acute or repetitive, can lead to posttraumatic arthritis, which accounts for approximately 12% of osteoarthritis cases. Chronic rotator cuff tears often result in a specific pattern of osteoarthritis known as cuff tear arthropathy, characterized by upward migration of the humeral head, which alters the joint structure. Additionally, glenoid dysplasia and chronic glenohumeral instability predispose individuals to shoulder osteoarthritis [36,38].

The diagnosis of shoulder osteoarthritis typically involves a clinical evaluation complemented by imaging studies. Radiographs serve as the primary imaging modality and are frequently augmented by MRI, computed tomography (CT), or ultrasound to provide more detailed assessments. Classic signs observed in radiographs include joint space narrowing, subchondral sclerosis, cyst formation, and osteophyte growth. Advanced imaging plays a crucial role in evaluating associated pathologies such as rotator cuff or glenoid issues, and in assessing the thickness of cartilage and the quality of bone [39].

Management of shoulder osteoarthritis depends on the severity of symptoms and the extent of joint damage. Non-surgical treatments include physical therapy, pharmacological interventions like NSAIDs, and corticosteroid injections to alleviate pain and inflammation [39]. In more severe cases,

surgical interventions are considered, particularly shoulder arthroplasty. There are three main types of shoulder arthroplasty: partial shoulder replacement, anatomic total shoulder arthroplasty, and reverse total shoulder arthroplasty [40,41].

Partial shoulder replacement, which includes humeral head resurfacing arthroplasty and humeral hemiarthroplasty, targets pathology on the humeral side, preserves bone stock, and maintains native anatomy [42]. Anatomic total shoulder arthroplasty treats both the humeral and glenoid surfaces and depends on a functional rotator cuff for successful outcomes. Reverse total shoulder arthroplasty, specifically designed for patients with rotator cuff tears, alters the normal ball-and-socket joint configuration to restore function via deltoid muscle tension [40,41].

Each type of arthroplasty comes with its own set of indications and postoperative challenges. Common complications include component loosening, glenohumeral instability, periprosthetic fractures, rotator cuff tears, infection, and nerve injury. The most frequent complication is component loosening, particularly of the glenoid component, often due to wear and instability. Glenohumeral instability typically presents as anterior or superior displacement, generally resulting from rotator cuff failure or incorrect positioning of the prosthetic components. Periprosthetic fractures may occur during surgery due to the techniques used, or postoperatively as a result of trauma. Although infections are relatively rare, they are serious complications that frequently necessitate revision surgery [40,41].

Reverse total shoulder arthroplasty is associated with unique complications, including anterosuperior instability resulting from unopposed deltoid contraction and scapular notching due to mechanical impingement. Other concerns include fractures of the acromial or scapular spine and mechanical failure of the prosthetic components, such as dislodgment of the glenosphere [40].

Preoperative imaging is essential in planning for arthroplasty, as it allows for the assessment of rotator cuff integrity and glenoid morphology, which are key factors in determining the appropriate surgical procedure. An intact rotator cuff is essential for successful anatomic total shoulder arthroplasty, whereas reverse total shoulder arthroplasty is more appropriate for patients with rotator cuff deficiencies. Advanced imaging techniques are used to evaluate glenoid morphology and bone stock, employing classifications such as the modified Walch criteria to facilitate surgical planning. Challenges such as posterior glenoid wear or retroversion are addressed through techniques like asymmetric

glenoid reaming, bone grafting, and the use of augmented components [41].

In summary, shoulder osteoarthritis significantly contributes to pain and disability, especially among the elderly. The complexity of the condition, its variable progression, and its profound impact on quality of life underscore the need for customized management strategies. Ongoing advancements in imaging, surgical methods, and prosthetic designs have enhanced outcomes for patients undergoing shoulder arthroplasty. Radiologists are crucial in diagnosing osteoarthritis, assessing preoperative findings, and detecting postoperative complications, thereby playing a key role in patient care.

Shoulder instability

Shoulder instability in older patients is characterized by a lower recurrence rate than in younger populations, yet it is frequently accompanied by a higher incidence of complications such as rotator cuff tears, fractures, and neurologic injuries [43]. In older adults, acute dislocations typically occur due to traumatic events that compromise the shoulder's stabilizing structures, including the anterior capsule, glenohumeral ligaments, and labrum. Additionally, age-related degeneration and comorbidities such as osteoporosis and rotator cuff degeneration present unique challenges in the management of shoulder instability in this age group [43,44].

The incidence of shoulder instability increases with age, peaking in women over 80 years, with traumatic anterior dislocations being the most common form [44]. Although older adults have lower recurrence rates compared to younger individuals, they frequently suffer from associated injuries. Up to 86% of patients older than 40 years experience rotator cuff tears following an anterior dislocation. These tears can range from small lesions to massive tears involving the posterosuperior or anterosuperior rotator cuff. Additionally, fractures such as Hill-Sachs lesions, greater tuberosity fractures, and glenoid fractures occur more frequently in this age group due to osteoporotic bone. Neurologic injuries, including axillary nerve or brachial plexus lesions, are also more common and severe in older adults, with recovery being less predictable than in younger patients [43,44].

The mechanisms underlying shoulder instability vary with age. In younger individuals, anterior dislocations are frequently associated with Bankart lesions, which involve the labrum and capsuloligamentous structures. In contrast, older patients more commonly experience capsular

ruptures and rotator cuff tears, indicative of age-related tissue weakening. Although less common, posterior instability is often related to rotator cuff deficiency or low-energy trauma, and chronic dislocations can present significant diagnostic challenges.

The management of shoulder instability in older patients is tailored to the specific injury pattern and the patient's overall health. For acute anterior dislocations, the initial treatment typically involves a gentle closed reduction, followed by imaging studies such as X-rays or CT scans to evaluate any associated injuries [45]. Conservative management, which includes sling immobilization, physical therapy, and gradual strengthening exercises, is suitable for first-time dislocations or stable reductions that do not involve significant tears or fractures. However, surgical intervention may be required in cases of recurrent instability, large rotator cuff tears, or significant bone deficiencies [45,46].

Surgical options vary depending on the specific pathology. Rotator cuff repairs are recommended for large or massive tears, especially when they are associated with functional deficits or nerve injuries. Bankart repairs, which are often performed alongside rotator cuff repairs, are indicated in cases of recurrent instability when there is no significant bone loss [47,48]. Severe deficiencies in the glenoid or humerus may require reconstructive procedures, such as glenoid augmentation with grafts or reverse total shoulder arthroplasty. The latter is particularly advantageous for patients with irreparable rotator cuff tears, chronic dislocations, or complex fractures [46,49].

The complications of shoulder instability in older patients include stiffness, persistent pain, and functional limitations [44]. It is crucial to address all components of the injury, such as rotator cuff pathology, osseous defects, and ligamentous damage, to optimize outcomes. However, maintaining a balance between achieving stability and preserving motion continues to be a challenge. In cases of chronic anterior dislocations, extensive releases, including pectoralis major release, may be necessary to achieve reduction. However, these procedures carry significant risks, such as vascular injury or residual instability [43].

Posterior shoulder instability, while less common, requires careful evaluation due to its frequent association with undiagnosed chronic dislocations [50]. Radiographic assessments in orthogonal planes and advanced imaging like CT are critical for identifying reverse Hill-Sachs lesions or posterior glenoid

fractures. Treatment involves reduction techniques tailored to the chronicity and severity of the dislocation, with arthroplasty often being the preferred option for severe cases with substantial bone or soft tissue loss [50].

In summary, shoulder instability in older patients poses unique diagnostic and management challenges due to age-related degenerative changes, associated injuries, and diminished tissue healing capacity. Although this condition has a lower recurrence rate in older individuals compared to younger ones, it is complicated by the presence of associated injuries such as rotator cuff tears, fractures, and neurologic injuries. Tailored treatment strategies that combine conservative management with advanced surgical interventions when necessary are essential for enhancing outcomes and restoring function in this demographic. Continued research and advancements in surgical methods and prosthetic designs are promising for overcoming the challenges associated with shoulder instability in older adults.

Table 1 shows a comparative overview of four major shoulder diseases in older adults.

Table 1. Comparative clinical characteristics of four major shoulder diseases in older adults.

Condition	Pathophysiology	Risk Factors	Clinical Presentation	Diagnostic Approaches	Treatment Strategies
Rotator cuff disease	Tendon degeneration, inflammation, and microtrauma leading to tendinopathy or tears. Involves cytokines (IL-6, IL-1β), muscle atrophy, and fatty infiltration.	Age (higher prevalence in those > 80 years), genetics, diabetes, obesity, smoking, repetitive physical activity	Pain (often nocturnal), limited mobility, weakness, difficulty with overhead activities	Clinical exam (Neer, Jobe, Hawkins–Kennedy tests), X-rays, MRI, ultrasound to assess tear size, tendon retraction, and muscle quality	Non-operative (physical therapy, NSAIDs, corticosteroid injections, emerging biologics) or surgical repair (arthroscopic rotator cuff repair, tendon transfer, reverse arthroplasty for irreparable tears)
Frozen shoulder (Adhesive capsulitis)	Fibroproliferative capsular fibrosis with inflammation, neo-angiogenesis, and excess collagen deposition, causing restricted joint motion and pain.	Diabetes, thyroid disease, cardiovascular disease, obesity, smoking, low physical activity, Dupuytren's disease	Severe pain, progressive loss of both active and passive range of motion; often goes through freezing, frozen, and thawing stages	Primarily clinical diagnosis (painful loss of motion), imaging (X-rays, MRI, ultrasound) to exclude other pathologies	Non-operative (patient education, physiotherapy, NSAIDs, corticosteroids, hydrodilatation) or operative (manipulation under anesthesia, arthroscopic capsular release)
Osteoarthritis	Progressive cartilage loss, osteophyte formation, subchondral sclerosis, and joint inflammation. Mechanical wear plus cytokine-driven inflammatory processes.	Aging, genetic predisposition, obesity, trauma, rotator cuff tears, chronic instability	Pain, stiffness, crepitus, functional limitations, often worsened by activity	X-rays (joint space narrowing, osteophytes), MRI or CT (assess rotator cuff, glenoid wear, bone quality), ultrasound (soft tissue evaluation)	Conservative (physical therapy, NSAIDs, corticosteroid injections) or surgical (arthroplasty: partial/hemi-arthroplasty, anatomic total shoulder, reverse total shoulder arthroplasty) based on cuff integrity and severity of damage

Shoulder instability	Disruption of stabilizing structures (capsule, ligaments, labrum) due to traumatic events or degenerative changes. Often complicated by rotator cuff tears, fractures, or neurologic injuries in older patients.	Advancing age, osteoporosis, rotator cuff degeneration, comorbidities (e.g., diabetes), history of dislocation	Acute or chronic dislocation, pain, inability to move the arm, associated rotator cuff or bony injuries	Radiographs or CT for fracture assessment, MRI for soft tissue lesions, clinical exam to assess stability	Closed reduction, immobilization, and rehabilitation if stable; surgical repair (rotator cuff, Bankart, arthroplasty) if there is recurrent instability, large tears, or osseous deficiencies

IL, interleukin; MRI, magnetic resonance imaging; NSAID, nonsteroidal anti-inflammatory drug; CT, computed tomography.

Conclusion

Shoulder diseases in older adults, including rotator cuff disease, frozen shoulder, osteoarthritis, and instability, pose significant challenges due to age-related degeneration and comorbidities. Effective management necessitates an accurate diagnosis, individualized treatment, and an appropriate balance between conservative and surgical approaches. Advances in surgical techniques, biologic therapies, and imaging have improved outcomes, but careful patient selection and multidisciplinary care remain critical. Future research should focus on optimizing therapeutic strategies and addressing the broader impacts of these conditions on quality of life. A patient-centered, evidence-based approach is essential to improving outcomes and improving the well-being of this vulnerable population.

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