



SCLERITIS



Eye Learn

All about the Eye

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SCLERITIS

1. Investigations, etiology and management of a case of necrotizing scleritis. J2009
2. Classification and brief clinicopathological profile of scleritis. 4+6 J2011
3. Classify scleritis. Discuss clinical manifestations, investigations and management of scleritis and its complications. J2012
4. a) Clinical features and types of anterior and posterior scleritis. b) How will you investigate a case of scleritis?
c) Management of necrotizing scleritis. (4+4+2) J2015
5. a) Classification of scleritis. b) Clinical features, investigation and management of scleritis. 2+(2+3+3) J2017
6. Scleritis and its management. (2006)
7. Scleritis. (2004) (2003) (2001)

Pathogenesis

- Scleritis is a much more severe ocular inflammatory condition than episcleritis.
- It is caused by an immune-mediated (typically immune-complex) vasculitis that frequently leads to destruction of the sclera. Scleritis is frequently associated with an underlying systemic immunologic disease; about one-third of patients with diffuse or nodular scleritis and two-thirds of patients with necrotizing scleritis have a detectable connective tissue or autoimmune disease.
- Scleritis causes significant pain and may lead to structural alterations of the globe, with attendant visual morbidity.
- It is exceedingly rare in children, occurs most often in the fourth to sixth decades of life, and is more common in women.
- About one-half of scleritis cases are bilateral at some time in their course.

Clinical presentation

- The onset of scleritis is usually gradual, extending over several days.
- Most patients with scleritis develop severe boring or piercing ocular pain, which may worsen at night and occasionally awaken them from sleep.
- The pain may be referred to other regions of the head or face
- Nodular episcleritis on the involved side and the globe is often tender to the touch.
- The inflamed sclera has a violaceous hue best seen in natural sunlight. Inflamed scleral vessels have a crisscross pattern, adhere to the sclera, and cannot be moved with a cotton-tipped applicator.
- Scleral edema, often with overlying episcleral edema, is noted by slit-lamp examination.
- Scleritis can be classified clinically based on the anatomical location (anterior versus posterior scleritis) and appearance of scleral inflammation

Classification

Immune mediated scleritis	Infectious scleritis
<p>I. Anterior scleritis</p> <ol style="list-style-type: none"> 1. <u>Non-necrotizing scleritis</u> <ol style="list-style-type: none"> a) Diffuse scleritis b) Nodular scleritis 2. <u>Necrotizing scleritis</u> <ol style="list-style-type: none"> A. Necrotizing scleritis with inflammation <ol style="list-style-type: none"> a) Vaso-occlusive scleritis- Rheumatoid arthritis b) Granulomatous Scleritis- Polyarthritis nodosa c) Post-surgical-Trabeculectomy, pterygium excision with MMC, scleral buckling B. Necrotizing scleritis without inflammation <ol style="list-style-type: none"> a) Scleromalacia perforans- RA <p>II. Posterior scleritis</p>	<ol style="list-style-type: none"> 1. HZV 2. TB 3. Leprosy 4. Syphilis 5. Lyme disease 6. Nocardia 7. Pseudomonas aeruginosa 8. Fungi

I. Anterior scleritis

1. Non-necrotizing scleritis

- a) **Diffuse anterior scleritis** is characterized by a zone of scleral edema and redness.
 - A part of the anterior sclera (<50%) is involved in 60% of cases; the entire anterior segment, in 40%



- b) In **nodular anterior scleritis**, the scleral nodule is a deep red-purple color, immobile, and separated from the overlying episcleral tissue, which is raised by the nodule

2. Necrotizing scleritis

- Necrotizing scleritis is the most destructive form of scleritis.
- Of the patients affected, 60% develop ocular and systemic complications, 40% suffer loss of vision, and a significant minority may die prematurely as a result of complications of vasculitis.

A. Necrotizing scleritis with inflammation

- Patients with necrotizing scleritis with inflammation typically present with severe pain.
- Most commonly, a localized patch of inflammation is noted initially, with the edges of the lesion more inflamed than the center.
- In more advanced disease (25% of cases), an avascular edematous patch of sclera is seen.
- Untreated, necrotizing scleritis may spread posteriorly to the equator and circumferentially until the entire anterior globe is involved.
- Severe loss of tissue may result if treatment is not intensive and prompt.
- The sclera may develop a blue-gray appearance (due to thinning, which allows the underlying choroid to show) and reveal an altered deep episcleral blood vessel pattern (large anastomotic blood vessels that may circumscribe the involved area) after the inflammation subsides.

B. Necrotizing scleritis without inflammation

- Though undoubtedly due to inflammation, this form of scleritis (also known as scleromalacia perforans) is said to be “without inflammation” because its clinical presentation is distinct from that of other forms of anterior scleritis, in which typical signs (redness, edema) and symptoms (pain) of inflammation are readily apparent.
- Scleromalacia perforans typically occurs in patients with long-standing rheumatoid arthritis.
- Signs of inflammation are minimal, and this type of scleritis is generally painless.
- As the disease progresses, the sclera thins and the underlying dark uveal tissue becomes visible.
- In many cases, the uvea is covered with only thin connective tissue and conjunctiva.
- Large abnormal blood vessels surround and cross the areas of scleral loss.
- A bulging staphyloma develops if intraocular pressure is elevated; spontaneous perforation is rare, although these eyes may rupture with minimal trauma.

II. Posterior scleritis

- Posterior scleritis can occur in isolation or concomitantly with anterior scleritis.
- Some investigators include posterior scleritis as an anterior variant of inflammatory pseudotumor. Patients present with pain, tenderness, proptosis, vision loss, and, occasionally, restricted motility.
- Choroidal folds, exudative retinal detachment, papilledema, and angle-closure glaucoma secondary to choroidal thickening may develop.
- Retraction of the lower eyelid may occur in up gaze, presumably caused by infiltration of muscles in the region of the posterior scleritis.
- The pain may be referred to other parts of the head, and the diagnosis can be missed in the absence of associated anterior scleritis.
- Demonstration of thickened posterior sclera by echography, computed tomography, or magnetic resonance imaging may be helpful in establishing the diagnosis.
- Often, no related systemic disease can be found in patients with posterior scleritis.

Complications of scleritis

- Complications of scleritis are frequent and include peripheral keratitis (occurring in 37% of cases), scleral thinning (33%), uveitis (30%), glaucoma (18%), and cataract (7%).
- Anterior uveitis may occur as a spillover phenomenon in eyes with anterior scleritis.
- Some degree of posterior uveitis occurs in all patients with posterior scleritis and may also occur in anterior scleritis.
- Although one third of patients with scleritis have evidence of scleral translucency and/or thinning, frank scleral defects are seen only in the most severe forms of necrotizing disease and in the late stages of scleromalacia perforans.
- A wide variety of corneal findings may accompany scleritis.



- In rare cases, corneas may develop central stromal keratitis in conjunction with scleritis, which is associated with heavy vascularization and opacification in the absence of treatment.
- In diffuse or nodular scleritis, the corneal changes are usually localized to the area of inflammation.
- In sclerokeratitis, the peripheral cornea becomes opacified by fibrosis and lipid deposition in conjunction with neighboring scleritis (which may be severe or very mild).
- The area of involvement may gradually move centrally, resulting in opacification of a large segment of cornea.
- This type of keratitis commonly accompanies herpes zoster scleritis but may also occur in rheumatic diseases.
- The differential diagnosis of scleritis is similar to that of PUK

Ocular	
Microbial	
Bacterial	<i>Staphylococcus, Streptococcus, Gonococcus, Moraxella, Haemophilus</i>
Viral	Herpes simplex, herpes zoster
Acanthamoeba	
Fungal	
Mooren ulcer	
Traumatic or postsurgical	
Terrien marginal degeneration	
Exposure keratopathy	
Rosacea	
Systemic	
Microbial	
Bacterial	Tuberculosis, syphilis, gonorrhea, borreliosis, bacillary dysentery
Viral	Herpes zoster, AIDS, hepatitis C
Helminthiasis	
Rheumatoid arthritis	
Systemic lupus erythematosus	
Wegener granulomatosis	
Polyarteritis nodosa	
Relapsing polychondritis	
Progressive systemic sclerosis and scleroderma	
Sjögren syndrome	
Behçet disease	
Sarcoidosis	
Inflammatory bowel disease	
α_1 -Antitrypsin deficiency	
Malignancy	

• Laboratory evaluation

- Scleritis can occur in association with various systemic infectious diseases, including syphilis, tuberculosis, herpes zoster, Lyme disease, “cat scratch” disease, and leprosy (Hansen disease).
- It is most frequently seen, however, in association with autoimmune connective tissue diseases such as rheumatoid arthritis, systemic lupus erythematosus, and seronegative spondyloarthropathies (eg, ankylosing spondylitis) or secondary to vasculitides such as Wegener granulomatosis, polyarteritis nodosa, or giant cell arteritis.
- Metabolic diseases such as gout may also, in rare instances, be associated with scleritis.
- More than one-half of patients with scleritis have an associated identifiable systemic disease.
- Because patients with certain forms of scleritis, especially necrotizing scleritis, have an increased rate of extraocular morbidity, its presence should be recognized as a manifestation of a potentially serious systemic disease.
- The workup of scleritis should therefore include a complete physical examination, with attention to the joints, skin, and cardiovascular and respiratory systems.
- Usually, this is best done in conjunction with a rheumatologist or other internist with experience in diagnosing and managing these conditions.
- No single approach can be used in the diagnosis of these patients’ possible underlying illness, and laboratory studies should always be guided by the history and findings of the physical examination.
- However, the following laboratory tests are generally recommended as an initial screening; other tests may then be ordered based on a more thorough rheumatologic (or infectious disease) examination:
 1. complete blood count (CBC) with differential erythrocyte sedimentation rate (ESR) or C-reactive protein (CRP)
 2. B-scan ultrasound image of a patient with posterior scleritis showing localized Sclerokeratitis.
 3. serum autoantibody screening (antinuclear antibodies, anti-DNA antibodies, rheumatoid factor, antineutrophil cytoplasmic antibodies)
 4. urinalysis
 5. serum uric acid test
 6. syphilis serology



7. chest x-ray
8. Sarcoidosis screening (serum angiotensin-converting enzyme and lysozyme), as appropriate

Management

- Topical corticosteroids (prednisolone acetate 1% or difluprednate ophthalmic emulsion 0.05%) can be used to reduce ocular inflammation in mild cases of diffuse anterior or nodular scleritis, but in general the treatment of scleritis is systemic.
 - For nonnecrotizing disease, especially diffuse disease, oral NSAIDs may be effective.
 - Some patients respond well to 600 mg of ibuprofen 3 times a day.
 - Severe nodular disease and necrotizing disease almost always require more potent anti-inflammatory therapy.
 - The use of TNF inhibitors such as infliximab in rheumatoid arthritis-associated scleritis has shown promise in treating this difficult disease.
 - Treatment is usually begun with oral corticosteroids.
 - Subconjunctival corticosteroids may be used to reduce scleral inflammation in non-necrotizing scleritis, when systemic administration is contraindicated or not feasible.
 - It is important to clearly define treatment goals: treatment failure may be defined as progression of disease to a more severe form (eg, nodular to necrotizing) or failure to achieve response to treatment after 2–3 weeks of therapy, in which case an alternate therapeutic strategy will need to be instituted.
 - Oral and/or high-dose (pulsed) intravenous corticosteroids may be effective for some cases of necrotizing scleritis or sclerokeratitis.
 - If no therapeutic response is observed with corticosteroids, however, systemic immunosuppressive therapy with an antimetabolite (eg, methotrexate), an immunomodulator (eg, cyclosporine), or a cytotoxic agent (eg, cyclophosphamide) is recommended.
 - Although there is no consensus, most clinicians place rheumatoid arthritis patients on methotrexate and reserve more potent cytotoxic therapy for patients with active vasculitic disease, such as Wegener granulomatosis.
 - Patients receiving systemic immunosuppressive therapy for scleritis should be monitored closely for systemic complications associated with these drugs.
 - Antituberculosis and anti-Pneumocystis coverage may be necessary for at-risk patients.
 - Both the treatment and long-term management of these patients are best performed as a collaborative effort between the ophthalmologist and rheumatologist.
 - In patients whose systemic evaluation is initially negative, it is important to repeat the workup annually.
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- **Treatment of Noninfectious Scleritis**
 - **Nonsteroidal anti-inflammatory drugs**
 - Nonsteroidal anti-inflammatory drugs (NSAIDs) may be effective in the treatment of nonnecrotizing scleritis.
 - These drugs serve to relieve pain and reduce inflammation, although they are useful primarily in milder cases.
 - No one drug has proved more effective than another, but indomethacin, flurbiprofen, and naproxen have all been used successfully.
 - If the initial NSAID fails, a second can be tried before switching to corticosteroids.
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- **Corticosteroids**
 - Topical corticosteroids such as difluprednate and prednisolone acetate are potentially useful in mild cases of scleritis or as adjunctive therapy.
 - Subconjunctival injections of corticosteroid have been shown to be effective in anterior non-necrotizing scleritis, although controversy remains surrounding this route of administration because of the theoretical complication of localized necrotizing disease following injection.
 - Systemic corticosteroids may be administered orally or as a high-dose intravenous pulse when rapid control is required.
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- **Immunomodulatory therapy**
 - Scleritis that is nonresponsive to corticosteroids or that requires doses of corticosteroids too high for long-term use should be transitioned to steroid-sparing immunomodulatory therapy (IMT).
 - Antimetabolites such as methotrexate, azathioprine, and mycophenolate mofetil have been used successfully, and calcineurin inhibitors are also an option.



- Scleritis associated with granulomatosis with polyangiitis (formerly, Wegener granulomatosis) and polyarteritis nodosa typically require more aggressive therapy with rituximab or cyclophosphamide.
- Biologic agents such as the tumor necrosis factor (TNF) inhibitors and rituximab have been reported to be useful in the treatment of many forms of recalcitrant scleritis.

- **Pain management**
- Because scleritis can be excruciatingly painful, attention to pain control is necessary.
- Oral NSAIDs may be of benefit, but their use in combination with oral corticosteroids or other systemic therapies should be avoided or—at a minimum—monitored carefully.
- The judicious use of oral narcotics may be appropriate for brief periods while anti-inflammatory therapy is instituted.
- Topical cycloplegia may also be of benefit.

- **Surgery**
- Scleral reinforcement surgery may be needed to address scleral thinning and to avoid the complications of globe rupture, which can occur with minimal trauma in patients with this disorder.
- Materials used for grafting include cadaveric donor sclera, but the scleral graft may melt, and some authors have recommended use of autogenous periosteum.