Bisphosphonate Induced Orbital Inflammation

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Introduction

- Bisphosphonates are a class of osteoclast inhibitors indicated in the treatment of disorders including osteoporosis, multiple myeloma, metastatic bone disease, and Paget's disease of the bone.
- Ocular side effects of bisphosphonates include conjunctivitis, episcleritis, scleritis, uveitis, and orbital inflammation.
- Orbital inflammation, otherwise known as Idiopathic Orbital Inflammation (IOI), Non-specific Orbital Inflammation (NSOI), or Orbital Pseudotumor, is a collection of disorders affecting orbital structures and soft tissues caused by a variety of pathologies including autoimmune disorders, infectious diseases, endocrinopathies, medication side effects, and idiopathic causes.
- Bisphosphonate induced orbital inflammation is a rare but documented side effect.

Case Report

- A 66-year-old female with a past ocular history of uncomplicated cataract surgery in both eyes presented to the emergency room in the setting of 5 days of gradual onset right sided periorbital and retroorbital pain worsening to the point of waking her up in the middle of the night. She had no improvement with acetaminophen or ibuprofen. On the day of presentation, she noticed right sided ptosis and injection.
- Her past medical history included anemia, depression, arthritis, and osteoporosis. Three weeks prior to presentation, the patient was started on Alendronate therapy for osteoporosis.
- She underwent initial neuroimaging including:
  - CT Angiogram of the Head and Neck: normal without stenosis, aneurysm, or dissection.
  - MRI brain with/without contrast: pachymeningeal enhancement of undetermined etiology (following extensive workup by Neurology).
- The patient had normal laboratory workup including CBC, CMP, ESR, CRP, TSH/T4, ACE, Muramidase, Quantiferon Gold, Lyme IgM/IgG, Syphilis IgM/IgG, ANCA, PR3, MPO. A lumbar puncture with CSF analysis, in the setting of pachymeningeal enhancement, was normal as well.
- MRI orbits with and without contrast was recommended, revealing mild streaky enhancement of right retrobulbar fat around the optic nerve sheath and orbital apex region.

Case Report

Ophthalmic Exam

- Visual Acuity: 20/20 OU
- External: Ptosis OD, MRD 1: 0.5mm OD, 3mm OS
- Conjunctiva/Sclera: 2+ injection with temporal chemosis OD, white and quiet OS
- Anterior segment: normal OU
- Fundus/periphery: normal OU

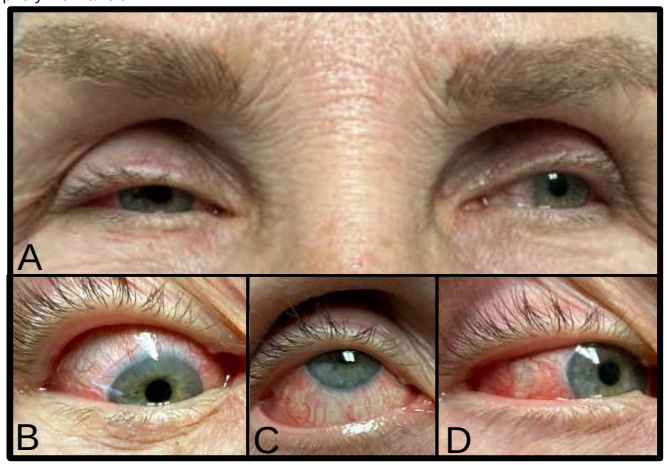

Figure 1: External photographs demonstrating ptosis (A), injection (B, C, D), and mild temporal chemosis (D) of the right eye.

Figure 2: MRI Orbit with contrast, T1 axial view (fat suppressed), demonstrating streaky enhancement of the right retrobulbar fat around the right optic nerve sheath and orbital apex region.

Discussion

- The patient was started on oral Prednisone (60mg/day with a 12-week taper).
- Alendronate was discontinued.
- Two weeks after initiating steroid treatment, the patient had resolution of ptosis, injection, and subjective symptoms.
- In current literature, there are approximately 40-50 cases of bisphosphonate induced orbital inflammation, most cases being associated with Zolendronate therapy. However, case reports likely underrepresent its incidence.
- The specific mechanism is unknown, although it is theorized that T cell and macrophage proliferation, as well as immune-complex deposition may play a roll. Secretion from the lacrimal gland may cause orbital involvement.
- Most cases occur relatively soon (within hours to 3 months) after starting therapy, with intravenous therapy being associated with a higher prevalence and shorter time to involvement.
- Workup includes detailed external/adnexal examination, dedicated orbital imaging, laboratory analysis, and careful history and medication reconciliation.

Conclusion

- Bisphosphonate induced orbital inflammation is a rare but possible condition well-documented in literature.
- It is suspected that the number of patients treated with bisphosphonates will increase with a current aging population, therefore an awareness and understanding of this adverse reaction is crucial for prompt diagnosis and treatment.
- Performing a thorough medication reconciliation is important in the evaluation and treatment of many ophthalmic conditions including orbital inflammation.

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