Imaging of the Orbits (1 hour)

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**Summary**

This course will be a comprehensive overview on diagnostic imaging of the orbits. Also included will be imaging of the lacrimal glands. The surrounding structures of the orbit, including paranasal sinuses will also be included, as disease in these anatomic regions may also affect the orbits. The material will be presented in a practical format to help clinicians establish appropriate ordering practices as well as to help in the appropriate imaging work-up of their patients. In addition to discussing the various imaging modalities, multiple different categories of disease will be covered. There will be multiple examples of each. Adult and pediatric cases are presented.

**Learning Objectives**

1. Understand technologies available to diagnose orbital disease utilizing imaging.
2. Understand when to order CT, MRI, radiographs, angiography.
3. Discuss the pros and cons of various imaging techniques.
4. Discuss more commonly encountered pathologies.
5. Discuss a few less common entities for completeness.

**Course Outline**

* Review of CT anatomy: axial and coronal planes; pre and post contrast administration
* Review of MRI anatomy: axial, coronal, sagittal; pre and post gadolinium administration
* Include clinical correlation when relevant.
* Understanding technologies available with which to image the orbits:
  + CT
  + MRI
  + PET/CT
  + MR Angiography
  + MR Venography
  + Conventional catheter angiography
  + Ultrasound
  + Radiolgraphy
* Case Discussion based on organized categories of disease, as described below:
* Anatomic variants and other “leave me alone lesions”: asymmetric paranasal sinus pneumatization, dehiscent lamina papyricia
* Infectious etiologies (both acute and chronic)
* Inflammatory processes: sarcoid, optic neuritis, MOG, perineuritis, thyroid eye disease, idiopathic orbital inflammation (pseudotumor), IGOI, granulomatosis with polyangiitis, Tolosa-Hunt, Mucocele.
* Trauma (inferior orbital wall, inferior wall trapped, superior orbital wall, penetrating trauma, dermoid, pediatric abusive head trauma associated with retinal hemorrhage, retinal detachment, )
* Neoplasms (optic glioma [unilateral and bilateral], retinoblastoma, meningiomas, squamous cell carcinoma, basal cell carcinoma, schwannoma, solitary fibrous tumor, esthesioneuroblastoma, undifferentiated carcinoma, breast metastases, neuroblastoma metastases, perineural tumor spread, rhabdomyosarcoma ).
* Arterial vascular Lesions (AV Malformation , AV Fistula, ophthalmic artery aneurysm, choroidal hemangioma.).
* Venous vascular etiologies (venolymphatic malformations, venous varix, lymphatic malformations, venous malformations, superior ophthalmic vein enlargement, pterygoid venous plexus)
* Congenital Lesions: epidermoid, dermoid, hemangioma, NF 1, Septo-Optic Dysplasia, meningocele, arachnoid cyst
* Iatrogenic: role of metallic opaque foreign bodies related to obtaining MRI, phthisis bulbi.
* Sequela of Systemic Disease: sarcoid, thyroid eye disease,
* Lacrimal gland neoplasms: lymphoma, adenoid cystic carcinoma.
* Lacrimal Apparatus infectious disorders, inflammatory lesions, cysts.
* Fibro-osseous lesions: enostosis, osteoma, ossifying fibroma, fibrous dysplasia, Langerhans Cell Histiocytosis.
* Miscellaneous (cosmetic fillers, scleral plaques, optic nerve head drusen, trochlear muscle calcifications, idiopathic intracranial hypertension, mascara and eyeliner artifact.).