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Orbital and Ocular Imaging: A Clinical Guide

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Short Communication

Orbital and ocular imaging has become an indispensable component of modern ophthalmology and radiology, offering detailed visualization of the eye and its surrounding structures. The orbit is a complex anatomical region containing the globe, extraocular muscles, optic nerve, vascular structures and connective tissues, all of which can be affected by a wide spectrum of diseases. Accurate imaging allows clinicians to evaluate these components, identify pathology early and plan appropriate medical or surgical interventions. By integrating imaging findings with clinical examination, physicians can achieve precise diagnosis and optimize patient outcomes.

Different imaging modalities provide complementary information about the orbit and eye. Computed Tomography (CT) is particularly valuable in assessing bony structures and detecting fractures, calcifications and acute trauma. It is the imaging technique of choice for orbital trauma, foreign body localization and evaluation of sinus-related orbital complications. Magnetic Resonance Imaging (MRI), on the other hand, offers superior soft-tissue contrast and is ideal for evaluating the optic nerve, extraocular muscles and intraorbital masses. MRI sequences can delineate inflammatory lesions, neoplasms and vascular abnormalities with remarkable clarity, helping distinguish between benign and malignant conditions [1].

Ultrasonography remains a first-line imaging tool in ophthalmology due to its non-invasive nature, portability and real-time capability. It is especially useful when direct visualization of the posterior segment is obstructed by media opacities such as dense cataract or vitreous hemorrhage. B-scan ultrasound can detect retinal detachments, vitreous opacities and intraocular tumors, while Doppler techniques help evaluate orbital blood flow and vascular lesions. Optical Coherence Tomography (OCT), a high-resolution, non-contact imaging modality, revolutionized the evaluation of retinal and optic nerve disorders by providing cross-sectional images at a microscopic scale, facilitating the diagnosis of macular degeneration, glaucoma and diabetic retinopathy.

In summary, orbital and ocular imaging provides a vital window into the anatomy and pathology of the eye and its surrounding structures. Through advanced modalities like CT, MRI, ultrasound and OCT, clinicians can visualize disease processes in exquisite detail, guiding diagnosis, monitoring therapy and preserving vision. As imaging technology continues to advance, its integration into clinical practice promises even greater precision and insight in the management of orbital and ocular disorders [2].

Keywords: Orbital imaging; Ocular MRI; Ophthalmic diagnosis

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Conflict of Interest

None.

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