Orbital decompression in Graves’ orbitopathy: state of the art and novel perspectives
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Chapter 9

Supernumerary Extraocular Muscle in Graves’ Orbitopathy

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Graves’ orbitopathy (GO), the commonest orbital disease, is due to autoimmune inflammation and swelling of the soft orbital tissues, including the extraocular muscles. The involvement of the extraocular muscles often leads to invalidating strabismus and diplopia. A 59-year-old man affected by GO with severe left hypotropia (Figure 1) presented a structure with computer tomography scan signal intensity similar to extraocular musculature, between the inferior and lateral rectus muscles left orbit. It appeared to course along the lateral edge of the inferior rectus up to the orbital apex (Figure 2 A-D, arrows).
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A better evaluation by means of magnetic tomography scan was not possible due to an irremovable dental prosthesis. Surgical exploration of the area confirmed the presence of a supernumerary extraocular muscle (SEM) (Figure 3, arrow).

It was inserted onto the sclera by a 3-mm-long, 5-mm-wide tendon, 5 mm laterally to the insertion of the inferior rectus muscle at 7 mm from the cornel limbus, and its belly was swollen. Eight months after retrobulbar irradiation, the decreased swelling of the inferior rectus and SEM allowed a better visualization of the two muscles on computer tomography scans. Such an examination confirmed that the SEM was an autonomous structure that originated from the orbital apex and not from the lateral edge of the inferior rectus muscle (Figure 4 A, B, arrows).
This report illustrates an apparent causal relationship between a swollen SEM and the pattern of strabismus presented by a patient with GO, suggesting that SEMs can also be affected by the disease and can contribute to worsen the clinical picture. SEMs are rare in humans and, as in primates, not deemed to be vestiges of the retractor bulbi, a typical occurrence in other vertebrates that more likely have SEMs.\textsuperscript{1} Although the combination GO-SEM is exceptional, physicians involved in the treatment of GO should be aware of such a possibility in order to avoid diagnostic and/or surgical mistakes.
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Reference