Short communication

Atypical traumatic scleral rupture: Presentation of a case

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ABSTRACT

Case report: We describe the case of a 42-year-old man who, after suffering an eye contusion, subsequently presented with a posterior scleral rupture, which was diagnosed using orbital computed tomography (OCT), and controlled without surgical treatment. The OCT performed two weeks later showed that the eyeball was intact.

Conclusions: A scleral rupture must be suspected when these three characteristics are present: hyphema, subconjunctival and vitreous hemorrhage.

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Introduction

Ocular traumatisms are a frequent cause of emergency visits, both in primary health care as well as in specialized centers. Most of these are insignificant but some cases can produce extremely severe sequels, to the point that ocular traumatism is the first cause of unilateral blindness in the world. Accordingly, every traumatism affecting the eyes or adjacent structures requires an
ophthalmological assessment in order to discard severe ocular injuries.

Ocular traumatism is much more frequent in males than in females and normally occurs in the adult age although children are not free of risk. The anterior segment is injured in isolation, while in over half of the cases, injuries affecting only the posterior pole are rare. In addition, it must be noted that a scleral rupture diagnostic after traumatism with concussion is not always easy. The 2 most frequent locations are the sclerocorneal limbus (under an intact conjunctiva) and parallel to muscle insertions, between the insertions and the equator. Radial and posterior ruptures are infrequent. The most frequently observed clinical data are hypotony (although not always present), an excessively deep anterior chamber, limitation of ocular motility and severe subconjunctival edema. Very rarely rupture can be diagnosed with ophthalmoscopy because frequently hyphema and/or vitreous hemorrhage is associated. Once the rupture has been diagnosed, surgery is carried out in the large majority of cases.

Patients usually refer traumatic antecedents which, depending on the severity and location of the injuries, remain asymptomatic or exhibit pain, reddening or alteration of the vision among other symptoms. Visual acuity is a key factor and its reduction indicates severity. In these cases, immediately after the traumatism over 40% of patients refer significant visual acuity loss (under 20/200). The ophthalmological exploration must be made with extreme care in order to discard penetrating injuries in the eye. In order not to worsen the clinical condition, when opening the eyelids to explore the eye the point of support must be the orbital edge, avoiding any pressure on the ocular globe.

In highly intense traumatisms, mainly those caused by objects that are smaller than the orbital edge, rupture of the globe can occur with greater ease. However, in eyes with previous diseases or scars, slight traumatism can also produce open concussions or ruptures. The approach in the emergency section is the same in both cases. In the majority of cases reconstruction of the ocular globe is attempted, while in other cases an expectant attitude is best.

**Case report**

A 42-year-old male patient visited the emergency section after suffering an impact in the left eye. The patient had previously undergone lens phacoemulsification with intraocular lens implant. Subsequently, vitrectomy was performed due to retina detachment, maintaining a post-surgery visual acuity of 2/10. The ophthalmological exploration gave a visual acuity in the right eye of 10/10 and of light perception and projection in the left eye. Biomicroscopy revealed moderate hyphema in the left eye, significant iris dialysis with the pupil involvement, folds in Descemet and extreme hypotony of the ocular globe (subsequently confirmed with applanation tonometry that gave ocular tension close to zero) (Fig. 1).

The ocular fundus exploration evidenced a massive hemovitreous, which prevented visualizing the retina. After discarding an anterior penetrating wound, the diagnostic of suspected posterior scleral rupture was developed and confirmed by orbital computerized axial tomography (CAT) (Fig. 2).

Considering the condition of the ocular globe, the patient was admitted under observation due to the high risk of massive expulsive suprachoroidal hemorrhage if surgery was undertaken. Antibiotic and corticoid treatment was prescribed, with an exhaustive follow-up of the affected eye as well as the contralateral eye due to the risk of developing sympathetic ophthalmia. Two weeks later the visual acuity improved from perception of light to perception of forms, with a recovery of the ocular globe structure confirmed with a new orbital CAT scan (Fig. 3), which evidenced a sealed posterior leak point compatible with reconstitution. After several months of follow-up the hemovitreous was progressively reabsorbed, revealing a significant cicatricial choroidal rupture (Figs. 4 and 5). This did not involve visual acuity improvements due to the involvement of the macula and the optic nerve (Fig. 6). In this case a massive ocular blowout was feared due to the initial CAT image, although subsequently we considered the possibility of a massive hyper-pressure which compressed the ocular globe as the...
cause of the tomographic image which subsequently recovered its shape when the rupture was closed. The fact that the globe was vitrectomized contributed to the feasibility of this scenario.

Discussion

A concussion injury with sufficient intensity to cause ocular rupture is well known although infrequent. Scleral rupture due to traumatism can be classified in 2 types: direct type, which occurs at the site of the traumatism, and indirect which occurs at a distance from the traumatism. Ruptures also involve the surrounding choroidal tissue and for this reason are generally associated with significant intraocular and subconjunctival hemorrhages. For this reason, the existence of hyphema next to subconjunctival hemorrhage and hemovitreous must always lead to consider the existence of scleral rupture. Typically, extensive ocular lesions\(^2\) can give rise to severe and frequently permanent loss of vision. Before the introduction of intraocular microsurgery, ocular globe ruptures involved a poor visual prognosis.

Cherry\(^5\) described the frequency of the localization of the ocular blowout, stating that it predominantly affected the upper region of the hemisphere and was more frequently located in the superonasal quadrant, between the limbus and the muscular ring. The preferred location of the indirect scleral rupture can be predicted on the basis of the Von Arlt theory: the globe diameter in the line of impact is reduced and secondarily there is an increase in the diameter of the equator in relation to said line. As the inferotemporal quadrant of the globe is the most exposed area it can be said that the most frequent location would be the superonasal quadrant before the muscular insertions. Obviously, this is not applicable to eyes that are vulnerable to the effects of impact injuries in which the rupture location is usually adjacent to previous surgical incisions. The clinical diagnosis does not give rise to doubts but echographies or even better orbital CAT can be made if any doubt arises. Whenever possible, the treatment should be identical to the treatment given to ocular globe open injuries. If surgery cannot be performed, an expectant attitude should be observed, allowing the situation to evolve.\(^5\)

In the case of traumatism that can involve ocular globe injuries, it is important to perform a detailed and exhaustive ophthalmological exploration,\(^1\) including supplementary tests such as echography or CAT to achieve certainty in the diagnostic. At present, the most frequent approach is to treat the injuries instantly with surgery, although if there is an extreme risk of expulsive suprachoroidal hemorrhage, an expectant attitude is usually the best option.

Conflict of interests

No conflict of interests has been declared by the authors.

References