

Orbital Inflammation Secondary to a Delayed Hypersensitivity Reaction to Sub-Tenon's Hyaluronidase

Soo Park and Lik Thai Lim

Tennent Institute of Ophthalmology, Gartnavel General Hospital, Glasgow, UK

ABSTRACT

We report a rare case of a delayed orbital inflammation with raised intraocular pressure as a result of hyaluronidase allergy following sub-Tenon's anaesthesia. Here, we have shown evidence to prove the orbital inflammation to be an allergic response to hyaluronidase with a skin patch test. This is the first case to our knowledge of a delayed hypersensitivity reaction to sub-Tenon's hyaluronidase comprising of an initial exposure to hyaluronidase in the fellow eye with no subsequent allergic response, but with a subsequent delayed reaction to hyaluronidase during a second eye cataract surgery. This case demonstrates hyaluronidase allergy should be considered as a differential diagnosis among patients presenting with acute post-operative orbital inflammation, even if there is a history of previous exposure to hyaluronidase in the fellow eye with no subsequent allergic response.

Keywords: Delayed hypersensitivity reaction, hyaluronidase allergy, raised intraocular pressure, sub-Tenon's anaesthesia

INTRODUCTION

We report a rare case of a delayed orbital inflammation with raised intraocular pressure as a result of hyaluronidase allergy following sub-Tenon's anaesthesia.

CASE REPORT

A 71-year-old female patient with bilateral cataracts underwent an uneventful left phacoemulsification with lens implant. During the surgery, the conjunctiva was anaesthetised with proxymetacaine 0.5% and 3 ml of sub-Tenon's anaesthesia (containing hyaluronidase 500 IU, lignocaine 2% and bupivacaine 0.5%) was administered inferonasally into the sub-Tenon's space. Povidone-iodine 5% was instilled into the conjunctival

sac three minutes prior to cataract surgery. Post-operatively, the patient made an uneventful recovery with a discharge prescription comprised of a four-times-daily regime of topical prednisolone 1% and chloramphenicol 0.5%. After eight months, she then underwent a right phacoemulsification with lens implant by the same surgeon using the same cocktail of sub-Tenon's anaesthesia and post-operative medication. However, on this occasion at 48 h post-operatively, she presented to eye casualty with a swollen and painful right eye. On examination, she was afebrile. BCVA in the right eye was reduced to 6/24. There was a 2 mm axial proptosis with mild restriction of oculomotility in all direction of gaze. The right eyelids were markedly oedematous to such an extent that she was unable to spontaneously open her eyelids. Anterior segment examination with a slit-lamp biomicroscopy showed chemosis of the right

Received 13 May 2012; accepted 2 December 2012; published online 19 June 2013

Correspondence: Soo Park, Tennent Institute of Ophthalmology, Gartnavel General Hospital, 1053 Great Western Road, Glasgow G12 0YN, UK. E-mail: sbpark6@gmail.com



FIGURE 1. Computed tomography of the orbits showing right proptosis, preseptal oedema, and swelling of orbital muscles.

conjunctiva with corneal epithelial bullae. The right intraocular pressure was elevated to 41 mmHg and there were moderate signs of anterior uveitis. Posterior segment examination was unremarkable.

RESULTS

Other than a raised eosinophil count to $0.6 \times 10^9/L$, full blood count showed absence of leucosytosis and erythrocyte sedimentation rate was normal. CT scan of the right orbit confirmed the presence of preseptal oedema, proptosis, and soft tissue oedema (Figure 1).

The combination of clinical, hematological, and radiological features were suggestive of an allergic reaction, possibly to sub-Tenon's hyaluronidase. This was promptly managed with oral as well as topical steroids. Caution was taken to cover for any potential infectious aetiology with intravenous antibiotics. The raised IOP was managed with a combination of oral and intravenous acetazolamide, and subsequently with intravenous mannitol. On the fifth post-operative day, there was complete resolution of the periorbital inflammation. Allergy to hyaluronidase was confirmed by a positive skin patch test to hyaluronidase 500 IU; no irritant reactions were seen to lignocaine 2%, bupivacaine 0.5%, cefuroxime, prednisolone 1%, povidone-iodine 5%, and chloramphenicol 0.5%.

DISCUSSION

Hyaluronidase¹ is an enzyme that catalyzes the hydrolysis of hyaluronic acid, a major constituent of the interstitial barrier. By doing so, it lowers the viscosity of hyaluronic acid, increases the tissue permeability, and is used in conjunction with local anesthetic to increase the spread and efficacy of nerve block. Allergy to hyaluronidase following sub-Tenon's anesthesia is uncommon with only five reported cases in the literature.²⁻⁴ These reports have described a delayed onset of periorbital inflammation from hyaluronidase allergy as a result of a combination of type 1 and type 4 IgE mediated delayed hypersensitivity response. Similar to our case, these cases demonstrated a delayed hypersensitivity reaction with raised IOP. However, the difference with our case is that there was previous exposure to hyaluronidase in the fellow eye with no subsequent allergic response, suggesting that sensitization to hyaluronidase must have occurred. Although uncommon, allergy to hyaluronidase should be considered as a differential diagnosis among patients presenting with an acute post-operative orbital inflammation, even if there is a history of previous exposure to hyaluronidase in the fellow eye with no subsequent allergic response, as illustrated in this case. Caution should be taken to exclude an underlying orbital cellulitis and systemic steroids may be of benefit once an infective focus has been ruled out.

DECLARATION OF INTEREST

The authors report no conflict of interest. The authors alone are responsible for the content and writing of the paper.

REFERENCES

1. Menzel EJ, Farr C. Hyaluronidase and its substrate hyaluronan: Biochemistry, biological activities and therapeutic uses. *Cancer Lett.* 1998;131:3-11.
2. Kumar CM, Dowd TC, Dodds C, Boyce R. Orbital swelling following peribulbar and sub-Tenon's anaesthesia. *Eye.* 2004;18:418-429.
3. Mukherji S, Esakowitz L. Orbital inflammation after sub-Tenon's anaesthesia. *J Cataract Refract Surg.* 2005; 31:2221-2223.
4. Musa F, Srinivasan S, King CM. Raised intraocular pressure and orbital inflammation: A rare IgE-mediated allergic reaction to sub-Tenon's hyaluronidase. *J Cataract Refract Surg.* 2006;32:177-178.