Sub-Tenon's Steroid Irrigation for Treatment of Intraorbital Capillary Hemangioma

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Summary

A four-month-old male infant underwent sub-Tenon's steroid irrigation for treatment of orbital capillary hemangioma that was causing exposure keratopathy risk to the left eye from progressive proptosis. The temporal inferior sub-Tenon's space was irrigated with a mixture of triamcinolone acetonide (40 mg/ml) and betamethasone sodium phosphate (6 mg/ml) by a blunt-tipped sub-Tenon's cannula. We describe this procedure as irrigation because reflux of the mixture from the incision was permitted. Two weeks after treatment, a marked reduction of proptosis was noted. One month after treatment, the volume of the intraorbital hemangioma resolved significantly in MRI examination.

Steroid treatment can be applied local or systemically to treat orbital capillary hemangioma but side effects must be considered carefully. Sub-Tenon's steroid irrigation may be a beneficial, effective, practical and safe application route in the treatment of orbital capillary hemangiomas.

Introduction

Capillary hemangiomas are the most common vascular tumors of children¹. The incidence of the tumor in the newborn population is between 1% and 2.6%². In clinical practice, capillary hemangiomas have three different

forms; the superficial strawberry nevus, the subcutaneous hemangioma and deep localized hemangioma³. Deep localized hemangiomas are usually unilateral and intraconally localized. Because of their localization, proptosis is a characteristic feature of these soft tissue tumors. Crying and valsalva maneuver may cause changes in tumor size.

The tumor grows until eight to 12 months and then generally spontaneous involution occurs with time. The tumor regresses with no treatment in 60 % of cases in five years and 90-95% of cases in nine years³. Strabismus, optic nerve compression, exposure keratopathy and amblyopia are the severe complications of capillary hemangiomas. Sometimes, treatment is unavoidable because of these severe complications or risk of complications. The most frequently utilized treatment modalities are systemic, topical and intralesional steroid. Laser, α interferon, radiotherapy and surgical debulking are the alternative modalities in cases which are unresponsive to the steroid treatment⁴⁻⁹.

In our study, we aimed to introduce a case of orbital capillary hemangioma successfully treated with sub-Tenon's steroid irrigation.

Case Report

A four-month-old male infant evaluated in our clinic because his family said that his left eye size changed when he cried and could not

Figure 1 Marked proptosis before sub-Tenon's steroid irrigation on the left eye.

close the left eye lid while sleeping. On his ophthalmologic examination, severe proptosis and telangiectatic vessels were seen on his left upper lid. Anterior and posterior segment examinations were normal. Magnetic resonance imaging (MRI) revealed orbital capillary heman-

gioma, which was intraconally localized and had extraconally extension in left orbital space (figures 2A,B).

Under general anesthesia, we performed a 2-3 mm conjunctiva and tenon's incision, parallel to the limbus and at a 8 mm distance from the

Figure 2 A) MRI (3D T2-weighted fat-supressed image) reveals a hyperintense mass in the retroorbital fat tissue causing proptosis and the optic nerve is medially displaced before treatment. B) MRI (postcontrast T1-weighted fat-supressed image) reveals a prominent enhanced mass lesion in the retroorbital fat tissue indicating capillary hemangioma. Also extraconal extensions of the lesion are seen in the image.

Figure 3 Two weeks after treatment there is a marked reduction in proptosis.

inferior temporal limbus. From this incision, a blunt dissection was made posteriorly. Sub-Tenon's space was slowly irrigated with a mixture of triamcinolone acetate (40 mg/ml) and betamethasone sodium phosphate (6 mg/ml) by a blunt-tipped sub-Tenon's cannula. During the application, reflux of the mixture from the incision was permitted to avoid the rise in intraorbital pressure so that this was not an injection but an irrigation.

Two hours after treatment, marked reduction of the proptosis was noted and two weeks after the operation, proptosis had regressed almost completely (figure 3). The volume of the intra-orbital hemangioma resolved significantly in the control MRI performed one month after the treatment (figures 4A,B).

Discussion

Currently, several treatment modalities have been utilized for the treatment of capillary hemangiomas including topical steroid, systemic steroid and systemic interferon. In a recent study, Wasserman et Al reported the treatment criteria as follows; obstruction of visual axis (98.2%), astigmatism (83.5%) and cosmetic (25.3%).¹⁰ Because of their spontaneous involution behavior if vision is not under threat, treatment is not recommended. When proptosis, optic nerve compression and amblyopia are seen, treatment is unavoidable.¹¹⁻¹⁴

Figure 4 A) MRI (3D T2-weighted fat-suppressed image) shows significantly decreased fat tissue mass volume and regressed proptosis, one month after treatment. B) Postcontrast T1-weighted fat-suppressed MRI shows the contrast-enhancing lesion is significantly decreased.

In this case, we planned treatment because of progressive proptosis and for the risk of exposure keratopathy. The mixture of triamcinolone and betamethasone was used to irrigate the sub-Tenon space. Sub-Tenon's steroid infusion was first performed by Coats et Al alternative to the other steroid modalities. They reported successful results in seven cases, five of them are unresponsive to oral steroid treatment and two cases with no previous treatment¹⁵.

Intralesional steroid injection is the most frequently utilized treatment. However, this route of steroid application may have some severe complications such as emboli secondary to steroid particles, direct damage to orbital tissue, retrobulbar hemorrhage and optic nerve compression secondary to retrobulbar hemorrhage¹⁶. The most frequently seen side effects of intralesional steroid applications are skin changes and adrenal side effects¹⁰.

Although systemic steroid treatment was used traditionally in these patients the procedure has a variable response rate from 30% to 90%. Also it can cause severe metabolic and systemic side effects like growth arrest, cushingoid characteristics or immunosuppression as all these patients are children¹⁷.

Interferon, an angiogenesis inhibitor, can be used in the treatment of hemangiomas that failed with steroid treatment. Subcutaneous injection of both interferon α -2a and α -2b, three million units per square meter of body surface area per day is recommended. Response to treatment ranges from a few weeks to months between the administrations. The most frequently seen side effects are irritability, neutropenia, abnormalities of liver enzymes and spastic diplegia¹.

Posterior sub-Tenon's triamcinolone injection carries potential risks including steroid glaucoma, optic nerve and central retinal artery damage due to intraorbital pressure rise during the application¹⁸. However, our procedure did not cause a rise in intraorbital pressure because it permits reflux of steroid through the incision. Conjunctiva and tenon incision may be a risk for infection but this will be minimized if the surgeon pay attention to sepsis-antiseptis rules. We did not encounter any complication in our case or in that of Coats et Al. Sub-Tenon's triamcinolone and betamethasone irrigation may be a practical, safe and effective treatment modality compared with the other modalities and their complications.

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