Successful fitting of a large diameter scleral lens as the treatment of a chronic keratopathy secondary to acoustic neuroma surgery: a case report

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INTRODUCTION

Acoustic neuroma is a benign tumor that may develop on the hearing near the inner ear. The tumor results from an overproduction of Schwann cells. When growth is abnormally excessive, Schwann cells press against the hearing and balance nerves, often causing gradual hearing loss, tinnitus and dizziness. If the tumor becomes large, it can interfere with the facial nerve, causing partial paralysis, and eventually press against nearby brain structures, becoming life-threatening.

Surgery for acoustic neuroma has developed over the years with a gradual improvement in outcome. The goal of surgery should be cure of the disease and a low morbidity, preserving facial nerve function - and hearing, too, whenever feasible (i.e. in small tumors). Subtotal or partial resections may be preferred for large tumors strongly attached to the brainstem, or in elderly patients, or when preserving a good facial nerve function is the primary goal of surgery. A growing residual neuroma might be amenable to radiotherapy.

The surgery-related death and severe complication rates are now lower than 0.5% in experienced hands. This means that properly-performed surgery can be considered a low-morbidity treatment, with very few major or minor complications. Small and medium-sized tumors do not differ in terms of the associated major complications, but the same cannot be said of the outcome on the facial nerve. Patients with tumors less than 1 cm in size have more than 96% rate of normal or near-normal facial nerve function after surgery, while in tumors up to 1.5 cm, the rate of facial nerve preservation is 83%. This rate drops to 70% in tumors over 2.5 cm, and to 50% in ones over 3.5 cm.

One of the potential complication relates to the 7th cranial nerve palsy, resulting in a complete paralysis of all the ipsilateral facial muscles. The consequences of the condition are numerous, but as an eye care provider, the eyelid paralysis resulting in a blinking anomaly and potential exposure keratopathy are of central concern.

SUBJECTIVE

• A 55 years old female underwent acoustic neuroma surgery in 2015. Despite the fact that the surgery was successful for tumor removal, it left the patient with neurologic sequelae. She had been affected by a chronic Bell’s palsy on the right side. Not able to blink normally, nor to close the eye overnight, the patient was symptomatic of severe eye dryness, ocular discomfort and pain.

• She consulted another eye care practitioner and was fitted with a 14.6 mm diameter scleral lens with base curve 7.3, power -3.25 and material Boston XO2, but remained with significant symptoms although she was using artificial tears (Systane PF, Alcon) frequently and tear supplement (Lacrilube) in ointment at night. She was looking for other option and was seen at University Clinic in October 2016.

OBJECTIVE

• Unaided visual acuity in OD was lower than 20/100, which improved to 20/25 with the mini-scleral on and over-refraction.

• Slit lamp exam revealed grade 2+ lower SPK with grade 2-nasal/temporal conjunctival hyperemia. There was no lacrimal lake visible at the lower margin. TBUT was not assessed due to the contamination of the tear film with the ointment.

• Ocular health otherwise (and in OS) was found normal.

ASSESSMENT

• Patient is presenting with chronic eye dryness second to post-surgical VIIe nerve palsy. She is affected by exposure keratopathy and lack of ocular lubrication.

PLAN

• It is impossible to restore a normal tear production function in such cases. It is then necessary to maintain a constant ocular lubrication by using tear supplement agents, preferably non-preserved to alleviate toxic or allergic reaction.

• Scleral contact lenses can be considered in the treatment plan. Not only they are protecting the ocular surface, but the fluid reservoir helps to keep the eye moist.

• Because of the severity of eye dryness, larger scleral lenses represent the best option.

SCLERAL LENS DESIGN

• Corneal topography was performed using Pentacam and the ocular surface was mapped with Smap 3D eye profiler. A 18-mm trial lens was designed with the use of the smap software. A Europa lens with base curve 45.25, sagittal 5.35, power -1.25 and diameter 18.0 mm, material Boston XO2 was ordered for the patient.

• At dispensing, lens was evaluated centered and stable after 30 minutes post-insertion. The central clearance was evaluated at 328 um under OCT and conjunctival alignment was reached in every quadrant due to the use of toric haptics. Patient reported good comfort and visual acuity was measured at 20/25 at distance in right eye and 20/20 in the left.

• Patient was instructed to use non preserved saline solution to fill the bowl, mixed with sodium hyaluronate based non-preserved artificial tears (Hylo 1 mg/ml, Candor Vision). Hydrogen peroxide care system was recommended. Lubrication during the day was authorized by using non preserved artificial tears (Systane PF or Oasys PF). Lubrication at night was maintained.

FOLLOW-UP

• Patient was seen a month later and reported a huge improvement in her condition. She reported a contact lens wear of 12 hours/day in average, did not feel pain nor discomfort anymore, at least while she was wearing her contact lenses. She did not feel the need to use lubrication during the day except under challenging environments (air conditioning, etc.).

• After 2h00 of wear, the lens was evaluated and found centered and stable. Entering V.A. remained good at 20/25. Central clearance was measured at 227 um under OCT. The reservoir was free of debris and the surface of the lens was slightly coated with oily deposits. No change was made at that time.

• A second follow-up visit was done after 3 months and the condition of the patient remained improved. After 1h30 of wear, central clearance was measured at 245 um.

CONCLUSION

Large scleral lens diameter can be useful to restore good vision and healthy ocular surface in patient with severe ocular dryness. This patient was fully satisfied with the lens selection because the dryness symptoms were decreased. The use of Europa lens with the Smap 3D topographer is an interesting choice to improve the lens landing especially for larger lens to improve the patient’s comfort, avoid compression and flexion of the lens.