Stevens-Johnson syndrome (SJS) is an acute inflammatory reaction of skin and mucous membranes induced by a drug or infection. Up to 60% of cases of SJS are caused by drugs. In SJS, progressive conjunctival inflammation and scarring may lead to eyelid malposition, total ocular dryness, ocular surface disease, and corneal pannus. Thirty-five percent of individuals presenting with the disease experience permanent loss of vision. Major therapeutic objectives include visual rehabilitation, stabilizing the ocular surface, and reducing severe discomfort; however, all types of corneal graft surgery have extremely poor prognoses in this condition.

The technique that offers the best results, as confirmed by long-term follow-up, is osteo-odontokeratoprosthesis (OOKP) surgery. Conceived by Strampelli, OOKP surgery has been modified over the years by Falcinelli and others. During OOKP surgery, a cylindrical optic is fitted into the patient’s own tooth and implanted into the eye to improve vision in patients with bilateral corneal blindness with good retinal and optic nerve function.

We report successful treatment of refractory glaucoma using endoscopic cyclophotocoagulation in a patient who had previously undergone OOKP surgery for SJS.

CASE REPORT
This case concerns a 62-year-old Indian man presenting with known SJS secondary to tetracycline therapy for 40 years. He had bilateral dry eye syndrome and corneal blindness. One year after being diagnosed with SJS, he underwent symblepharon release surgery with placement of a mucous membrane graft in both eyes in India. However, no visual improvement was noticed in his left eye because of graft failure, and the symblepharon was aggravated. He was using ointments and artificial tears 4 times daily in both eyes.

In 2011, in Rome, he underwent another symblepharon-release operation with mucous membrane grafting in the left eye because of visual disability. Intraocular pressure (IOP), measured by finger palpation, rose during the follow-up period, necessitating implantation of an Ahmed glaucoma valve (New World Medical) in the superotemporal sector of each eye, which normalized IOP levels.
OOKP surgery was advised for the left eye after a detailed assessment of the patient and was performed in Rome in 2 stages. Stage 1 was carried out in May 2011 with the removal of the patient’s own superior tooth. The ocular surface was denuded and covered with a full-thickness buccal mucosal graft. Stage 2 was performed 3 months later, in August 2011. The tooth-cylinder complex (osteo-odonto-lamina) was harvested, and surrounding excess soft tissue was removed. The complex was implanted into the cornea after reflection of the buccal mucosal flap, corneal trephination, total iridodialysis, cryoextraction of the lens, and anterior vitrectomy. A window was made in the buccal mucosa on the optical cylinder to ensure visual perception.

After 2 months, visual acuity was 4.5/10, the eye was still slightly firm but acceptable, and the buccal mucosa was healthy. The visual field worsened, however, despite the use of glaucoma medications including bimatoprost 0.1% (Lumigan, Allergan), brinzolamide 1% (Azopt, Alcon), timolol maleate 0.5% (Imot Oftino, Sophia), and oral acetazolamide 250 mg (Diamox, Teva Pharmaceuticals) 2 times daily.

A second Ahmed valve was implanted in the supranasal sector of the left eye in India. A follow-up spiral computed tomography scan was performed to assess long-term stability of the osteo-odonto-lamina (Figure 1, A–C).

Despite the new treatment, the visual field (Humphrey 10-2) continued to worsen (Figure 2, A and B); hence, a decision was made to apply 140° of endoscopic photocoagulation to the ciliary body.

Endoscopic cyclophotocoagulation was performed in Ravenna, Italy, in October 2012 using a minimally invasive vitrectomy system to minimize surgical trauma. The endoscope was passed through the osteo-odonto graft. Buccal mucosa was dissected in the inferotemporal sector, after which 2 25-gauge sclerotomies and 1 20-gauge sclerotomy were made in the pars plana at a distance of 11.5 mm from the edge of optical cylinder. The endoscope was inserted through the 20-gauge sclerotomy. Endoscopic vitrectomy was performed, followed by endophotocoagulation on the nasal sector of the ciliary body (Figure 1, D and E).

On the first postoperative day, the eye was firm, with minimal conjunctival inflammation. The patient was discharged on antibiotic and steroid drops. A week later, visual acuity was 6/10 and IOP was judged to be fairly normal on palpation. After 3 months, IOP and visual field showed some improvements (Figures 1F and 2C); visual acuity improved too, reaching 8/10.

At 12 and 18 months later, IOP and visual field were stable (Figure 3, A and B); visual acuity reached 8.5/10.
Osteo-odonto-keratoprostheses have shown good long-term anatomic survival, and OOKP is currently the preferred treatment for patients with end-stage inflammatory corneal disease who are not amenable to any other type of vision-restoring surgery.\(^4,5\)

The most common indications for OOKP surgery are SJS and thermal or chemical burns. Other indications include ocular cicatricial pemphigoid stage 3 or 4, Lyell syndrome, epidermolysis bullosa acquisita, trachoma, and vascularized cornea with complete loss of stem cells.\(^6,7\) These conditions present an extremely hostile ocular surface environment that is unsuitable for the survival of corneal grafts, ocular surface transplantation procedures, and other synthetic keratoprostheses. Postoperative visual acuity has been the major functional parameter to evaluate the success of OOKP surgery.

The most vision-threatening complication of OOKP surgery is secondary glaucoma.\(^5\) Approximately 7% to 47% of all patients requiring keratoprosthesis surgery have preexisting secondary glaucoma.\(^6\) A high incidence of glaucoma was noticed by Tan et al (47.2%)\(^8\) and Liu et al (34.2%).\(^9\) It is difficult to establish whether the glaucoma is caused by the surgery or whether it is related to previously existing anterior segment abnormalities involving the trabecular meshwork and angle. In patients with an OOKP, glaucoma is diagnosed and monitored by an ophthalmoscopic assessment of the optic disc and visual field.\(^9\) IOP is difficult to measure after OOKP surgery.\(^9\)

Topical and systemic glaucoma medications, aqueous shunt surgery, and diode laser are all potential management options. Glaucoma drainage implants prevent the severe elevation of IOP that occurs in some patients treated with keratoprosthesis surgery.\(^9\) Monitoring of the optic nerve and visual field is, therefore, recommended for all patients with a keratoprosthesis, includ-
ing those treated with drainage implants. Although progression to end-stage glaucoma can occur despite the use of glaucoma drainage implants, these implants effectively reduce the IOP and prevent glaucomatous optic nerve or visual field changes in most patients.

An alternative is endoscopic cyclophotocoagulation, which can be performed using a minimally invasive vitrectomy system to minimize surgical trauma. Here we report successful treatment of refractory glaucoma in a patient who underwent OOKP surgery for SJS. Further cases are needed to determine the success of this procedure in controlling pressure levels in patients with OOKP.

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