Case Report

Lamellar Keratoplasty Using Microkeratome-Assisted Anterior Lamellar Graft in the Management of Deep Limbal Dermoid: A Case Report

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Abstract

Limbal dermoid is a congenital benign tumor of the limbus which is often managed by surgery if necessary. In dermoid lesions involving the deep stroma, tumor excision and reconstruction of the anterior segment with amniotic membrane transplantation or keratoplasty may be required. Herein, we present a case of deep limbal dermoid treated with surgical resection and lamellar keratoplasty using microkeratome-assisted anterior lamellar graft.

Keywords: Limbal dermoid, excision, microkeratome-assisted anterior lamellar graft, lamellar keratoplasty, reconstruction

Introduction

Limbal dermoid is a congenital benign tumor of the limbus. It accounts for 10% of all and 29% of benign limbal tumors.[1,2] Anatomically, limbal dermoids are classified into three groups according to the depth of invasion of the anterior segment components. Grade I tumors are superficial lesions, grade II tumors involve part of the corneal stroma, and grade III tumors occupy the full corneal thickness and may penetrate into the anterior chamber.[3] Surgical removal is often opted for grade II and III lesions. The choice of surgery can be simple excision, or anterior segment reconstruction via amniotic membrane transplantation (AMT) with or without autologous limbal stem cell transplantation, or lamellar keratoplasty.[4,5,6,7,8] Penetrating keratoplasty is usually opted for lesions involving the full thickness of the cornea or in case of corneal perforation during excision.[8] Herein, we present a case of grade II limbal dermoid treated with lamellar excision and lamellar keratoplasty via microkeratome-assisted anterior lamellar graft.

Case Report

A 2.5-year-old boy was referred to our clinic with the diagnosis of limbal dermoid in the left eye leading to progressively increasing astigmatism. Visual acuity (VA) of the left eye was 20/200. Clinical examination revealed a corneal-conjunctival fleshy dome-shaped lesion measuring approximately 8.5x8.5 mm in size. The visual axis was partially occluded by the lesion (Figure 1). Refractive error could not be measured accurately due to distortion of the retinal reflex on retinoscopy. The patient had no history of associated systemic abnormality.

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The lesion was removed from the corneal surface manually using a 57 Beaver knife. After excision, the remaining stroma appeared very thin, and no thickness measurement could be done with an ultrasound pachymeter. A lamellar corneal button 0.5 mm larger than the excised dermoid bed was fashioned using the automated lamellar keratoplasty technique. The donor tissue was placed on an artificial anterior chamber and after removal of the epithelium, a 9-mm corneal flap 300 µm in thickness was obtained using a Moria microkeratome (Moria Inc., Doylestown, PA, USA). This tissue was then placed to cover the excised area on the cornea and sclera, and was sutured to the surrounding tissues with interrupted 10/0 monofilament nylon sutures (Ethilon 10.0, Ethicon, Johnson & Johnson, USA). Postoperatively, a bandage contact lens (AirOptix Night & Day, Alcon, USA) was placed on the eye and the patient was prescribed topical prednisolone acetate 1% (PredForte, Allergan Pharmaceuticals, Ireland) and fluoroquinolone 0.5% eye drops (Vigamox, Alcon, USA) 4 times a day for 1 week. One week later, prednisolone acetate drops were replaced by loteprednol etabonate 0.5% (Lotemax, Bausch & Lomb, USA) 4 times a day for 1 week. One week later, prednisolone acetate drops were replaced by loteprednol etabonate 0.5% 4 times a day and the steroid dose was gradually tapered at follow-up examinations over a period of 3 months. Occlusion of the right eye was started for the treatment of amblyopia. The corneal sutures were removed at postoperative 3 months. One year after the surgery, the lamellar graft looked healthy with no epithelial defect, corneal vascularization, or inflammation. Mild stromal haze was noted (Figures 2a, 2b). Uncorrected VA was 40/200 and cycloplegic retinoscopy revealed refraction values of +2.75 D sphere and +1.00 D cylinder with a 70° axis.

Discussion

After excision of deep limbal dermoids, leaving bare stroma is usually not recommended due to the postoperative tendency towards the formation of scar tissue, neovascularization, and pseudopterygium. Various methods of reconstruction to decrease the scarring and pseudopterygium have been reported, including the use of mitomycin C after excision, AMT with or without limbal stem cell transplant, or lamellar keratoplasty with lamellar/full-thickness grafts.[4,5,6,7,8]

Full-thickness grafts for lamellar keratoplasty may be more prone to complications such as prolonged reepithelization, interface neovascularization, steroid-induced glaucoma, and graft rejection.[9] Lamellar keratoplasty with lamellar grafts is more commonly used with complications including mild interface haze and pseudopterygium.[7,8] Varying degrees of astigmatism can occur as a result of increased length of cornea invaded by the limbal dermoid.[10]

Automated lamellar therapeutic keratoplasty is a relatively new technique which was developed to obtain better postoperative anatomic and refractive outcomes. In this technique, the diseased portion of the stroma is removed using a microkeratome with adjustable heads. Then, a matching lamella of stroma is obtained from the donor tissue with the aid of an artificial anterior chamber and microkeratome. One of the advantages of using microkeratome heads to prepare an anterior lamellar graft is the ease of obtaining a flap, which decreases the duration of the surgery and facilitates reproducible results.[11] It is also reported to have better outcomes than manual lamellar keratoplasty in terms of surface epithelization and postoperative refraction since it forms a smooth graft which is in optimal alignment with the host tissue.[11,12] Our patient demonstrated a healthy donor cornea with no epithelial defect, and mild astigmatism at the end of follow-up. Although the donor-host tissue apposition was not perfect because of manual excision of the dermoid, a smoother and more regular donor flap could be obtained with the automated technique, which probably contributed to faster epithelization and a more regular surface leading to mild astigmatism.

Anterior segment optical coherence tomography (OCT) and/or ultrasound biomicroscopy may be useful tools to evaluate the depth of tumor invasion, estimate the thickness of the tissue to be excised, and better follow up the donor-recipient tissue interface.[13,14] These these measurements could not be performed in our case due to the young age of the patient. Intraoperative

Figure 1. Preoperative picture of left eye limbal dermoid occluding the visual axis

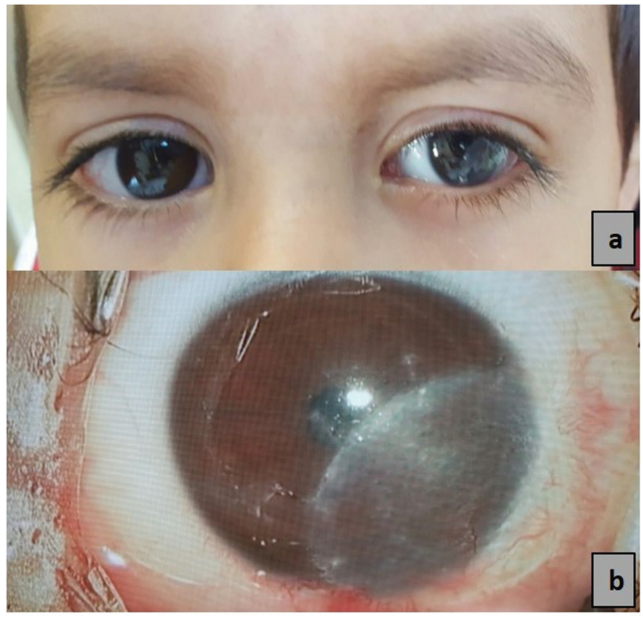

Figure 2. One-year postoperative picture with no epithelial defect or neovascularization. Mild stromal haze is observed

OCT can also be utilized during excision to help achieve a smooth ocular surface free of lesion.[15]

In conclusion, microkeratome-assisted anterior lamellar grafts can be used for ocular surface reconstruction following the excision of deep/large dermoids. This approach provides better wound healing and the remaining tissue can be used for endothelial keratoplasty.

Ethics

Informed Consent: Obtained.

Peer-review: Externally peer reviewed.

Authorship Contributions

Concept: Ö.Ö.U.G., A.K.G., H.N.B., Design: Ö.Ö.U.G., A.K.G., H.N.B., Data Collection or Processing: Ö.Ö.U.G., A.K.G., H.N.B., Analysis or Interpretation: Ö.Ö.U.G., A.K.G., H.N.B., Literature Search: Ö.Ö.U.G., A.K.G., H.N.B., Writing: Ö.Ö.U.G., A.K.G., H.N.B.

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