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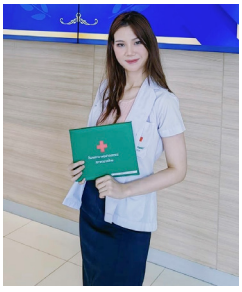
Recurrent Wound Dehiscence after Trabeculectomy in Uveitic Glaucoma: A Case Report

รายงานผู้ป่วยที่มีภาวะแผลแยกซ้ำหลังการผ่าตัดต้อหิน ในผู้ป่วยต้อหินที่เกิดจากโรคม่านตาอักเสบ



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Abstract

Objective: To report an unusual case of recurrent wound dehiscence after trabeculectomy and its management.

Observation: A 47-year-old Thai male with non-granulomatous anterior uveitis of his left eye underwent trabeculectomy with mitomycin C due to uncontrolled intraocular pressure. At postoperative 1 week, conjunctival retraction was observed with the exposure of the base of scleral flap. Conjunctival flap advancement with 10-0 nylon was performed to prevent bleb leakage and risk of intraocular infection. Ten days after conjunctival flap advancement, recurrent conjunctival wound retraction was seen with more amount of scleral flap exposure and positive Seidel test. Conjunctival flap advancement with amniotic membrane transplantation over the scleral flap was performed. A week later, an exposed scleral flap with conjunctival retraction was encountered again. We decided to reconstruct the conjunctival flap with corneoscleral patch graft covering the anterior two thirds of the scleral flap area. At follow up 10 months, corneoscleral patch graft was still in a good position on scleral flap. The intraocular pressure was 10 – 12 mmHg with 0.5% timolol maleate eye drop. No recurrent wound dehiscence occurred.

Conclusion: Recurrent conjunctival dehiscence after trabeculectomy is an unusual complication after trabeculectomy despite multiple surgical corrections with watertight wound closure. The only distinctive personal risk factor that associated with this condition was current smoking. Delay wound healing has been reported in smokers. We assumed that smoking may be a potential cause of poor wound healing in this patient. Conjunctival resuture alone may not enough to handle a large size leakage. Wound reconstruction with biological tissue graft should be considered.

Keywords: Bleb leak, glaucoma, smoking, trabeculectomy, uveitic glaucoma, wound dehiscence

บทคัดย่อ

วัตถุประสงค์: เพื่อรายงานผู้ป่วยที่มีภาวะแผลแยกซ้ำหลังการผ่าตัดต้อหิน และวิธีการรักษา

รายงานผู้ป่วย: ผู้ป่วยชายไทยอายุ 47 ปี ได้รับการวินิจฉัยเป็นโรคม่านตาอักเสบตาและมีความดันตาสูงในตาข้างซ้าย โดยไม่สามารถคุมความดันตาได้ ผู้ป่วยจึงได้รับการผ่าตัดเปิดทางระบายน้ำจากลูกตา หนึ่งสัปดาห์หลังผ่าตัด ตรวจพบเยื่อตาขาวรั้งขึ้นเหนือแผลผ่าตัดที่ตาขาว จึงได้ทำผ่าตัดเย็บซ่อมโดยการเย็บดึงเยื่อตาขาว หลังจากนั้น 10 พบเยื่อบุตาขาวรั้งขึ้น เห็นแผลที่ตาขาวอีกครั้ง จึงได้ทำผ่าตัดเย็บดึงเยื่อตาขาวมาติดที่กระจกตา ร่วมกับการใช้เยื่อหุ้มรกเย็บคลุมอีกชั้นหนึ่ง หนึ่งสัปดาห์หลังจากนั้น เยื่อบุตาขาวยังคงรั้งขึ้น จนกระทั่งเห็นแผลผ่าตัดที่ตาขาวเช่นเดิม จึงได้นำชิ้นส่วนตาขาวและกระจกตา ที่ได้รับบริจาคจากผู้เสียชีวิต มาวางและเย็บปิดบริเวณ 2/3 ด้านหน้าของแผลที่ตาขาว และเย็บเยื่อตาขาวติดกับกระจกตา หลังการตรวจติดตามหลังผ่าตัดครั้งสุดท้าย 10 เดือน ไม่พบการดึงรั้งขอเยื่อตาซ้ำ

สรุป: ภาวะแผลแยกซ้ำหลังผ่าตัดต้อหินเป็นภาวะแทรกซ้อนที่พบได้ไม่บ่อย ผู้ป่วยรายนี้มีประวัติการสูบบุหรี่เรื้อรังที่เป็นปัจจัยเสี่ยงต่อการเกิดแผลแยกซ้ำ การผ่าตัดแก้ไขโดยการเย็บเยื่อตาเพียงอย่างเดียว อาจไม่สามารถปิดแผลที่เกิดจากการดึงรั้งได้ การเย็บแผลร่วมกับการใช้เนื้อเยื่อกระจกตาและตาขาวหรือเนื้อเยื่ออย่างอื่น สามารถช่วยเพิ่มความแข็งแรงของการสมานแผลได้

คำสำคัญ: Bleb leak, glaucoma, smoking, trabeculectomy, uveitic glaucoma, wound dehiscence

Introduction

Trabeculectomy is the most frequent glaucoma filtering surgery to lower the intraocular pressure (IOP) when maximal glaucoma medications are not enough to control the IOP. However, many postoperative complications are encountered. Bleb leakage is a common complication after trabeculectomy and occurs more in fornix-based conjunctival flap compared to limbal-based fashion[1,2]. The causes of wound leakage are wound dehiscence, incomplete conjunctival closure, and the use of adjunctive anti-metabolites. The risk factors that interfere wound healing are elderly, diabetes, immunocompromised condition, obesity, smoking, alcohol consumption and stress[3]. Treatment modalities for wound leak depends on the extent and severity of the leakage. For small bleb leak, aqueous suppressant, soft bandage contact lens with topical antibiotic is sufficient to close the leak[4]. If the conservative treatment is not enough, surgical interventions are indicated. Additional indications for surgical interventions are prolonged hypotony, recurrent wound leakage, and repeated episodes of bleb-related infection. We report a case of recurrent conjunctival wound dehiscence after trabeculectomy with a reconstruction method.

Case report

A 47-year-old Thai male presented with non-granulomatous anterior uveitis of his left eye. Eye examination revealed normal eye exam in the right eye. Left eye examination revealed microcystic edema without keratic precipitate. Anterior chamber cell can't be evaluated due to corneal edema. Anterior chambers were deep in both eyes. His intraocular pressure was 16 and 60 mmHg, right and left eye, respectively. Cup to disc ratio was 0.3 in the right eye and 0.4 in the left eye. Fundus examination was unremarkable in both eyes. He took oral acetazolamide 250 mg four times a day, a fixed combination of 0.2% brimonidine tartrate and 0.5% timolol maleate ophthalmic solution three times a day. Diagnostic anterior chamber paracentesis showed positive for Epstein-Barr virus (EBV) by polymerase chains reaction-based method and positive quantiferon-TB Gold. Vitreous sample was not collected for investigation. Hypertensive viral-associated anterior uveitis was suspected. His uveitis condition was treated with 800 mg oral acyclovir five times a day. The inflammation was continuously controlled by topical prednisolone acetate 1% every two hours. A week later, he was sent to glaucoma clinic because of persistent IOP elevation. At first presentation, his visual acuity in the left eye was 20/50 with IOP of 50 mmHg. Cornea revealed mild microcystic edema without cell in the anterior chamber. Gonioscopy was grade 3 in all mirrors without any pigment or peripheral anterior synechiae. Cup to disc ratio was 0.5. Due to persistent IOP elevation, filtering surgery had been scheduled.

He underwent trabeculectomy with mitomycin-C in the left eye by a glaucoma expert (AM). After subconjunctival injection of 2% Xylocaine, superior conjunctival flap was made in a fornix-based fashion. A wet-field bipolar cautery was applied to stop bleeding over the scleral flap area. Then we applied sponges soaked with mitomycin-C 0.3 mg/ml into subconjunctival space. Care was taken to avoid the mitomycin-C to touch the edge of conjunctival wound. After 3 minutes, all sponges were removed, followed by copious irrigation. Superior trapezoid scleral flap was created. Sclerostomy was made with Kelly Descemet punch and iridectomy was done to

prevent an obstruction of iris at the sclerostomy site. The scleral flap was then closed with 10-0 nylon. The scleral flap sutures were adjusted for adequate drainage. Conjunctiva was closed by 10-0 nylon and checked for watertight wound closure at the end of the surgery. There was no intraoperative or immediate postoperative complications. The patient was prescribed with topical prednisone acetate every 2 hours during the daytime and topical levofloxacin four times a day.

On the first postoperative day, his best corrected visual acuity was 20/20. The bleb was moderately diffuse with negative Seidel test. IOP was 17 mmHg with formed anterior chamber and no choroidal detachment. One week later, the conjunctival retraction was observed with the exposure of the base of scleral flap. The Seidel test was negative. The IOP was 24 mmHg with formed anterior chamber. No choroidal detachment was detected. Consequently, conjunctival flap advancement and resuture with 10-0 nylon was performed. Ten days after that, recurrent conjunctival wound retraction was seen with more amount of scleral flap exposure (Figure 1). The Seidel test was positive. The IOP was 14 mmHg with low bleb. Anterior chamber was deep without choroidal detachment. Conjunctival flap advancement in combination of amniotic membrane transplantation over the scleral flap was performed. We covered the conjunctiva flap with two-layer amniotic membranes and suture with 10-0 nylon. On the first postoperative day, the bleb was moderately diffuse with negative Seidel test. The conjunctiva was sutured securely without dehiscence (Figure 2). A week later, an exposed scleral flap with conjunctival retraction was encountered again with positive Seidel test (Figure 3). The IOP was 5 mmHg, deep anterior chamber without choroidal detachment. We decided to reconstruct the conjunctival flap with corneoscleral patch graft. We placed the donor corneoscleral graft to cover the anterior two thirds of

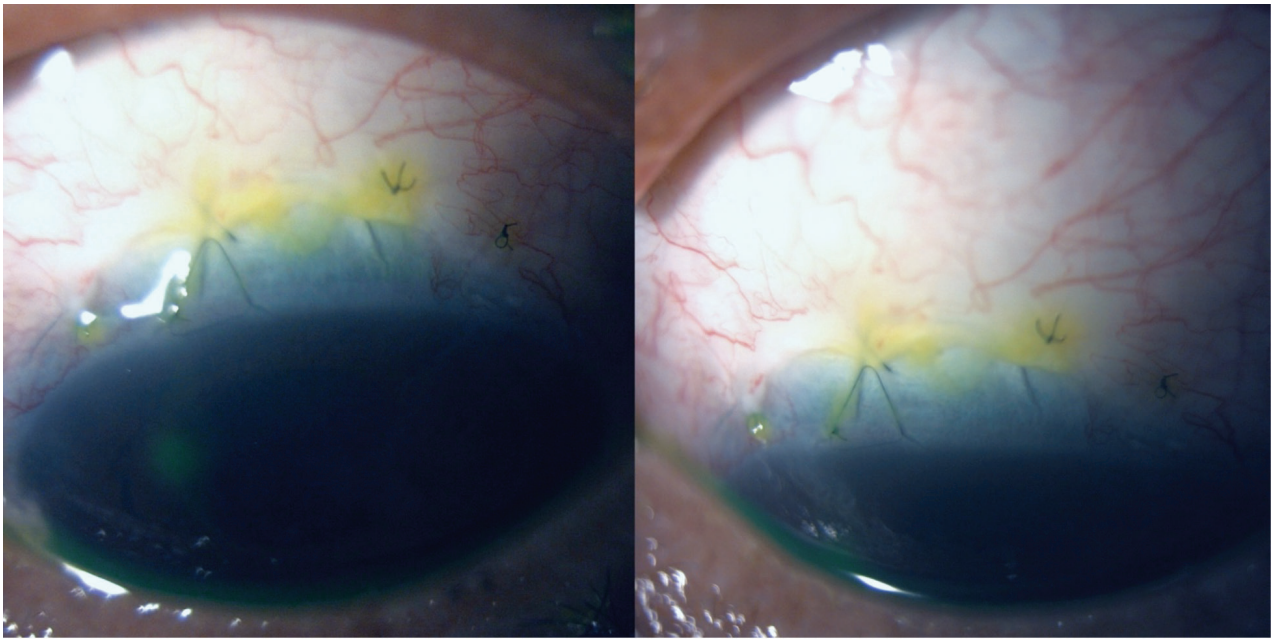

Figure 1 Conjunctival wound retraction with expose scleral flap after conjunctival flap advancement and resuture.

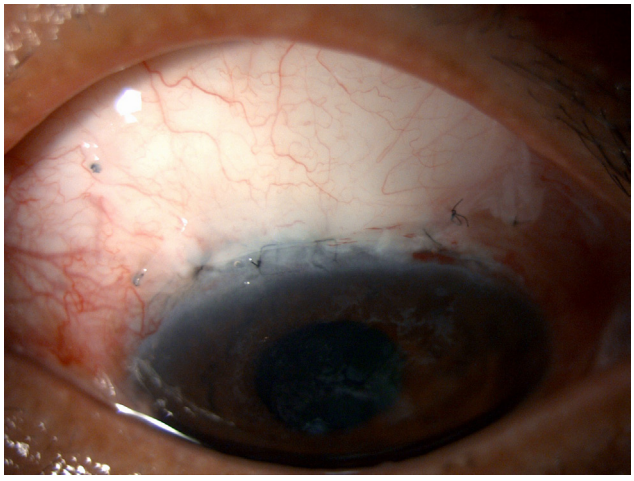

Figure 2 Conjunctival flap advancement with amniotic membrane transplantation.

Figure 3 Exposed scleral flap with conjunctival retraction after conjunctival flap advancement with amniotic membrane transplantation.

the scleral flap area and check for adequate aqueous leakage. The conjunctiva was sutured securely with no leakage was seen. One week after the last operation, best corrected visual acuity was 20/25. The IOP was 7 mmHg, formed anterior chamber without choroidal detachment. The bleb was moderately diffuse. The Seidel test was negative. Corneoscleral patch graft was still in a good position on scleral flap without wound dehiscence (Figure 4). After the last procedure, the conjunctival retraction was still observed but because of the integrity of the corneoscleral graft, the leakage was not occurred (Figure 5). Best corrected visual acuity was 20/20 with IOP between 10 and 13 mmHg in the first three months. After that, the IOP was 14 mmHg with cup to disc ratio of 0.7, 0.5% timolol maleate twice a day was prescribed. After that, the IOP was between 10 and 12 mmHg until 10 months after the last operation.

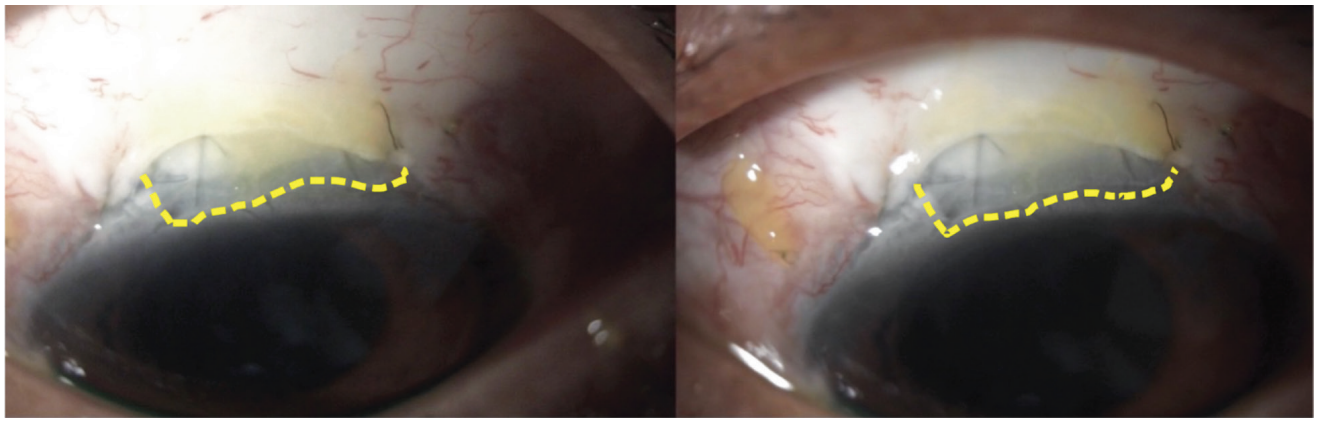

Figure 4 One week after conjunctival flap resuture with corneoscleral patch graft.

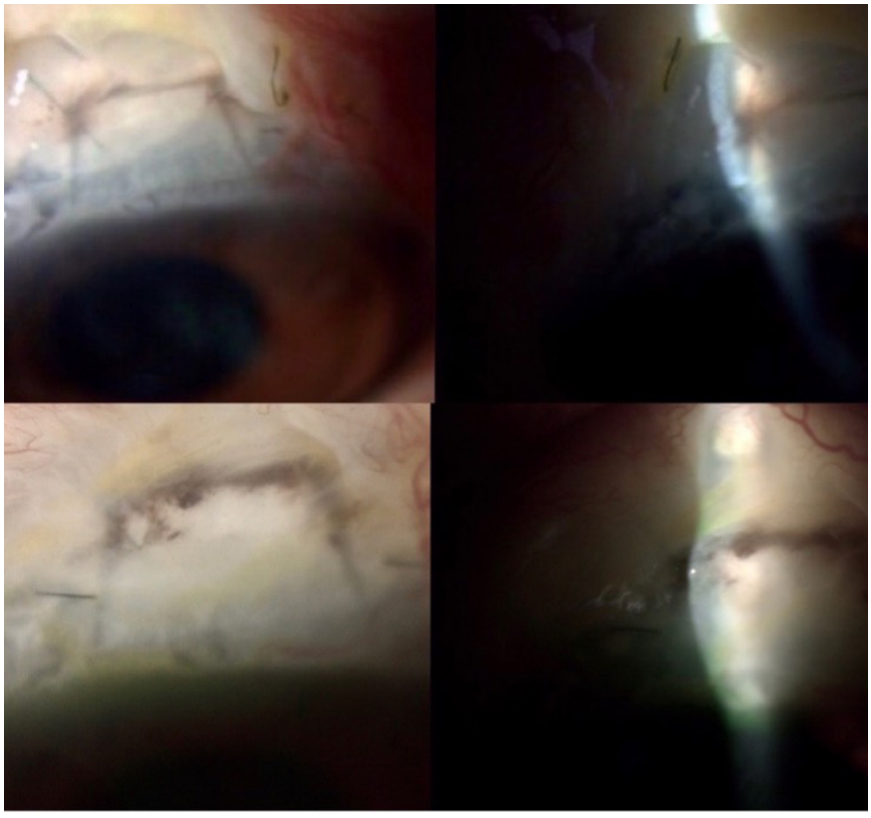

Figure 5 Conjunctival wound findings after conjunctival flap suture with corneoscleral patch graft (Top row: 1 month after surgery, Bottom row: 10 months after surgery).

Discussion

Conjunctival wound leak is a common complication in trabeculectomy. In this patient, conjunctival wound retraction was the cause that led him to multiple conjunctival reconstruction procedures after filtering surgery. Initially, conjunctival flap advancement had been done alone. However, scleral flap exposure was still presented. Conjunctival repair with amniotic membrane transplantation was performed as a second procedure. After that, wound dehiscence rediscovered. Finally, conjunctival restoration with corneoscleral patch graft was done without recurrent episode of wound dehiscence.

There were two interesting points in this case. Firstly, we present a case with recurrent wound dehiscence that is not common after trabeculectomy. During the trabeculectomy surgery, his wound was sutured securely, and no wound leak was detected. Besides, the duration of the surgery was within an hour. During all follow up visits, there was no sign of infection such as blebitis or conjunctivitis. We thought over the causes of poor wound healing in this case. The only distinctive personal history in this patient was continuous smoking prior to surgery. Tobacco smoker patients required higher surgical intervention such as bleb revision, repeat trabeculectomy, tube implant, and cyclophotocoagulation within one year after trabeculectomy compared to non-smokers. In addition, one-year success rate of trabeculectomy was significantly lower in smokers than non-smokers[5].

Good wound healing required delicate balance from inflammation and wound fibrosis. It consists of three phases: inflammation, proliferation and fibrosis[4]. Smoking delayed wound healing by several mechanisms. Tissue oxygenation was reduced, and inflammatory cells were suppressed. Also, proliferative phase was impaired by decreased fibroblasts and down regulated collagen synthesis. Smoking impaired neutrophil activities affecting oxidative bactericidal mechanism which required for eradicating surgical pathogen. Besides, smoking and nicotine significantly disturbed tissue perfusion and oxygenation due to endothelial dysfunction and vasoconstriction beyond the tolerable level of normal tissue. Smoking also had an impact on oxidative stress causing low levels of antioxidants and deteriorated collagen mechanism resulting in damage of tissue components[6]. As smoking greatly affected on inflammation, including wound proliferation and remodeling, we assumed smoking convincingly affected poor wound healing in this patient. One of the local risk factors of wound leak is the application of antimetabolite4. In the case, we used mitomycin-C 0.3 mg/ml which is in the recommended concentration of 0.2–0.4 mg/ml. The duration of application was 3 minutes which was not prolonged. The patient strictly applied medications as prescribed.

The second issue is the reconstruction method. According to trabeculectomy wound leakage, various biological grafts such as amniotic membrane, scleral graft, corneal graft either in full thickness or partial thickness, pericardium, buccal membrane, fascia lata can be considered[7]. The advantage of all materials is to strengthen the wound, however, depends upon availability. Multiple failures by using the same material are associated with lower success rate[11]. Therefore, in this case, we started with conjunctival advancement alone, followed by adjunct with amniotic membrane. Amniotic membrane has been used to repair bleb leakage, including cystic bleb[8,9]. However, the leakage in our case is because of the conjunctival retraction. The extension of leakage may be too board to heal with amniotic membrane alone. Recently, Laspas, et al. reported the benefit of corneoscleral graft to repair hypotony with scleral melting. The IOP was control after 6 months after surgery[10]. In our case, we successfully secure the wound with corneoscleral graft. To prevent obstruction of the aqueous drainage, we covered the corneoscleral graft only the anterior two-thirds of the scleral flap height. The IOP at 10 months after the last reconstruction procedure was 12 mmHg.

Conclusions

Bleb leakage in combination with conjunctival wound dehiscence is an unusual complication after trabeculectomy. The only distinctive personal risk factor that associated with this condition was current smoking. Conjunctival resuture alone may not enough to handle a large size leakage. Wound reconstruction with biological tissue graft should be considered.

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Footnotes and Financial Disclosures

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