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Management of punctal occlusion post – viral conjunctivitis

Fawwaz A. Al-Sarayra, Khalil M. Al-Salem, Mohammad M. Al-Salem, Tarek A. Dalbah, Noor M. Al-Sammarraie, Abdelrahman M. Alharazneh

Department of ophthalmology, Mutah University, Al-Karak 61710, Jordan

Correspondence to: Khalil Al-Salem. Department of ophthalmology, Mutah University, Al-Karak 61710, Jordan. Khalil_alsalem@ hotmail. com

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治疗病毒性结膜炎引起的泪小点闭塞

Fawwaz A. Al-Sarayra, Khalil M. Al-Salem, Mohammad M. Al-Salem, Tarek A. Dalbah, Noor M. Al-Sammarraie, Abdelrahman M. Alharazneh

(作者单位:约旦 61710,穆塔大学,眼科)

通讯作者:Khalil M. Al-Salem. Khalil_alsalem@ hotmail. com

摘要

目的:评估以不同的方法治疗病毒性结膜炎并发症泪小点及泪小管闭塞的疗效。

方法:此回顾性群组研究共纳入 35 例临床确诊为感染病毒性结膜炎的患者,经治疗后完全缓解,4wk 后并发泪小点闭塞。本研究采用了泪小点扩张术,穿孔硅胶泪小点栓子植入术, 和 Mini-Monoka 硅胶管植入术对该 35 例泪小点闭塞患者进行治疗。

结果:首先,单独采用泪小点扩张术对所有 35 例患者进行治疗,其中只有 6 例患者(17. 14%)取得了满意的疗效。其次,采用穿孔泪小点栓子植入术对上述采用泪小点扩张术无效的患者进行治疗, 有 20 例(57. 14%)患者取得了较好的疗效。最后,采用 Mini-Monoka 管植入术对上述两种治疗方案都无效的患者进行治疗,有 9 例(25. 71%)患者的病情取得了重大的改善。另外,通过对上述病例进行统计分析,结果表明该疾病的严重程度与 Mini-Monoka 管的使用和是否双眼同时患病或者和上、下泪小点同时闭塞并无关联。

结论:运用穿孔硅胶泪小点栓子能够有效治疗由病毒性结膜炎引起的泪小点闭塞。对分别经泪小点扩张术和穿孔硅胶泪小点栓子植入术治疗无效的患者,可采用 Mini-Monoka 管植入术以取得良好的治疗效果。

关键词:泪小点闭塞;泪小管闭塞;机械扩张;泪小点栓子;Mini-Monoka 管;腺病毒

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Abstract

• AIM: To evaluate the effect of different methods in managing punctual and canalicular stenosis as a complication of viral conjunctivitis.

• METHODS: A retrospective cohort study, including 35 cases of punctal stenosis post-viral conjunctivitis. Cases were diagnosed clinically and treated after 4wk of complete remission from epidemic keratoconjunctivitis. Patients were treated with mechanical dilatation, insertion of perforated silicon punctual plugs or the use of Mini-Monoka stent.

• RESULTS: Six out of 35 (17. 14%) had a satisfactory outcome by punctal dilatation alone. Punctal dilatation with insertion of perforated punctal plugs was done in 20 cases (57. 14%). Nine cases (25. 71%) had punctal dilatation with Mini-Monoka tube insertion. Disease severity and the use of Mini-Monoka silicon tube did not correlate with bilateral eye involvement or involvement of both upper and lower punctum.

• CONCLUSION: Management of punctal occlusion post viral conjunctivitis may be treated easily using perforated punctal plugs. Silicon intubation with Mini-Monoka might be needed to manage resistant cases.

• KEYWORDS: punctal occlusion; canalicular occlusion; mechanical dilatation; punctal plugs; Mini-Monoka tube; adenovirus

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INTRODUCTION

Punctual occlusion is caused by aging, chronic blepharitis, ocular cicatricial pemphigoid, graft-versus-host disease, dry eye syndrome, eyelid malposition, chlamydia trachomatis, actinomyces, herpes virus, human papilloma virus, topical medications (*e. g.* Timolol, Latanoprost) and systemic medications[1]. Epidemic keratoconjunctivitis (EKC), which is caused by adenovirus or coxsackie virus, has never been reported in literature to cause punctal occlusion or stenosis to the best of our knowledge. EKC is an acute and highly contagious infection of the eye

caused principally by adenovirus species D particular, serotypes D8, D19, and D37. More recently D53, D54, and D56 have been associated with EKC[2-6].

Management options of punctal stenosis includes recurrent punctal dilatation, perforated punctal plugs, Mini-Monoka stent (FCI Ophthalmics, Issy Les Moulineaux, Paris, France), balloon dilation, and punctal snip procedures (one-snip punctoplasty, two-snip procedure, three-snip procedure)[1].

In the winter of 2013, an outbreak of EKC happened in southern part of Jordan, a lot of cases were documented in Al-Karak (urban part of Jordan). Here in, we are reporting the management of patients presenting with EKC who suffered from canalicular stenosis post infection.

SUBJECTS AND METHODS

The Human Ethical Committee of Mutah University, medical faculty, approved the study protocol, according to the tenets of Declaration of Helsinki. Al-Karak is a small district in southern Jordan; it has two major hospitals (governmental Karak hospital and Italian charity hospital). Charts of the above mentioned hospitals, in the ophthalmology department, were reviewed from January 2013 to January 2014.

Systematic chart review started by checking the diagnosis (adenoviral conjunctivitis). From those cases, only patients who had punctal stenosis and persistent epiphora, after remission from EKC, were involved in the study. Charts were screened for age, gender, symptoms (red conjunctiva, upper respiratory tract infection, lymphadenopathy, presence or absence of fever), and slit lamp examination; looking for punctal involvement (upper or lower), presence of follicular reaction in the lower fornix, corneal involvement. Punctal stenosis had to be within 4 to 8wk of recovery from the virus. Punctal stenosis diagnostic modality was slit lamp examination only. All cases were treated by the protocol of ophthalmology department at Mutah University by Alsarayra FA and Al-Salem KM. Data was collected by Al-Sarayra FA, Dalbah TA, Al-Sammarraie NM, Alharazneh AM.

Cases withocular cicatricial pemphigoid, chemical injury, graft-versus-host disease, dry eye syndrome, eyelid malposition, chlamydia trachomatis, actinomyces, herpes virus, human papilloma virus, glaucoma cases on long term eye drops, and patients with epiphora before the viral infection were excluded from the study. Pediatric age group (below 18y) was excluded from the study. This is due to our limited experience in inserting punctal plugs for pediatric patients. In addition, pediatric patients are uncooperative in the office setting.

Treatment Protocol At Mutah University, the management of punctal stenosis starts with mechanical dilatation using punctual dilator alone; this is attempted only once. If that fails; mechanical dilatation with insertion of perforated silicon punctual plug will be used. Finally, if all fails, punctal dilatation with insertion of Mini-Monoka tube is inserted. Punctal dilatation, insertion of perforated punctal plugs and Mini-Monoka lacrimal stent are performed using topical anesthesia on an office based setting. For patients who required more than one procedure, according to the treatment protocol, a month period is left between each procedure. Post-operative care includes the use of short course of topical steroids. Patients are followed up in 1wk, and one month period. Perforated punctal plugs and Mini-Monoka are removed after 12wk of insertion.

Statistical Analysis Simple demographic statistics were applied to the data; this included the mean and range of age, gender, management style, presenting symptoms, laterality, follow up period, and the time frame between the appearance of viral conjunctivitis symptoms and epiphora caused by punctual occlusion. All statistics were verified and rechecked with a statistician. A two tailed t-test was used in finding a correlation; whether involvement of the upper punctum or involvements of both eyes were risk factors to increase the use of Mini-Monoka tube in the management.

RESULTS

A total of 2371 charts were reviewed from both hospitals in Al-Karak district (governmental Karak hospital and Italian charity hospital), 326 cases of EKC infection were identified during the period of January 2013 to January 2014.

Thirty-five cases, with persistent epiphora, were managed according to Mutah University protocol. The mean patient's age was 48±12. 7SDy, ranging from 26-77y. Three cases (8. 57%) were above the age of 65, twenty-three cases (65. 71%) between 40-64y, and nine cases (25. 71%) were below 40y. Females formed 51. 4% of the total cases with managed epiphora. The average period between getting the infection and the complaint of epiphora was 2. 9wk; the range of presentation was from 1-4wk. The mean follow up of patients was 18wk; ranging from 16 to 20wk in the sample collected. All cases had red conjunctiva, and lower follicular reaction. Lymphadenopathy was documented in 15 cases (42. 86%), eleven cases had no lymphadenopathy (31. 4%), and nine cases had no record of lymphadenopathy involvement (25. 71%).

Diagnosis of punctal stenosis was done by slit lamp examination in all cases. Isolated lower punctal occlusion was seen in 27 cases (77. 14%), combined lower and upper punctal occlusion was seen 8 cases (22. 86%). It is worth notice that non-had an isolates upper punctal occlusion. In six out of 35 cases (17. 14%) had satisfactory outcome with punctal dilatation alone. Punctal dilatation with insertion of punctal plugs had a favorable outcome in 20 cases (57. 14%). Finally, nine cases (25. 71%) had punctal dilatation with mini-Monoka tube insertion.

No correlation was found between bilateral disease and increased use of Mini-Monoka tube; $P=3.3$ (insignificant $P=$

0.05). In addition, involvement of the upper punctum was not associated with increased use of Mini-Monoka tube; P value was 1.3 (insignificant $P=0.05$).

DISCUSSION

Several different procedures have been described to treat punctal stenosis. These included one-snip punctoplasty, two-snip punctoplasty, three-snip punctoplasty[7], simple punctal dilation, snip procedure with insertion of perforated punctal plug, punctal punching[8-10], pigtail probing[11], and the use of intraoperative adjuvants like Mitomycin C[12].

The limitation of any procedure that involves cutting the annular ring of the punctum is restenosis from fibrotic scarring. Some authors have recommended performing a one-snip procedure to alleviate the punctal stenosis, followed by insertion of perforated punctal plugs to reduce the risk of restenosis[13]. However, stent migration and canalicular distal blockage are the main drawbacks of this procedure. Therefore, avoiding any form of snip procedure reduces the likelihood of stent migration and loss[7,9]. In a series of 22 patients with Mini-Monoka tube insertion for any cause following snip operations, 29% had premature stent loss and 14% had stent migration[8,9]. Another series of 27 patients with punctal stenosis treated with a one-snip procedure and Mini-Monoka insertion, 9.4% had premature stent loss [7]. Due to this, we have limited our options to treat punctal stenosis to involve; punctal dilation, the use of perforated punctal plugs and the use of Mini-Monoka tube. We do not use any snip procedure at our service.

The use of simple silicone tubing used as a mono-canalicular stent (the Monoka stent), without a one-snip procedure has been previously described for the treatment of punctal stenosis[7-9]. Some authors believe, the disadvantage of this technique is that the stent requires a suture to be passed though it and in the internal aspect of the punctum and then out through the skin of the eyelid and tied, to allow fixation of the stent [9]. However, this problem is overcome by the use of Mini-Monoka tube, as no sutures are required for its insertion.

Our method of dealing with punctal stenosis in Mutah University is limited to three lines of managements. The first is punctal dilatation alone; this method showed a very limited success rate in our hands (17.14%). The second method is the use of punctal dilatation with the insertion of perforated punctal plugs. Adding the plug has raised the success rate to 57.14%, the plugs were kept for 3mo. Finally; the very resistant cases (25.71%) are retreated using punctal dilatation with insertion of a Mini-Monoka tube, which was removed after 3mo.

In our results, no isolated upper punctal stenosis was documented. Many dry eye studies suggest that occlusion of the upper punctum or the lower punctum has similar efficacy in treating dryness. Hence, they suggest that the drainage of both the upper and the lower punctum is equal in amount[14]. The study of Yen *et al*[15] suggests that occlusion of one punctum, causes a decrease in tear production and improves drainage through the other punctum after the third day of occlusion. These findings partly explain the absence of an isolated upper punctal involvement, and this might also suggest that many asymptomatic patients with isolated lower punctal occlusion never reported to our service. Hence, the current study cannot estimate the true incidence of punctal occlusion post viral conjunctivitis from our view, as we might be looking at the tip of an iceberg.

The staged approach in treating patients with punctal stenosis, in the current study, is unique. To our knowledge such staged approach in treating punctal stenosis has never been described before. However, many studies described the efficacy of punctal stenosis, perforated silicon punctal plugs or Mini-Monoka tube in the treatment of punctal stenosis separately[8,16-18]. In the current study, perforated punctal plugs has a presumed efficacy of 74.28% (57.14% + 17.14%), since Mini-Monoka was used in 25.71%. Perforated punctal plugs have been reported to have a success rate of 85% in treating punctal stenosis[16,18]. For example, Chang *et al*[16] demonstrated a success rate of 85%. Failure was seen in elderly above 67y and patients suffering from chronic blepharitis. Another study by Konuk *et al*[18] showed that perforated punctal plugs had a success rate of 84.1%. Failure rate was linked to old age and horizontal lid laxity. The relative lower success rate of perforated punctal plugs, in the current study, might be attributed to the inflammatory nature of the EKC, as we had only 3 senior patients (age above 65y).

The current study has some limitations. Firstly, the lack of virology evidence using polymerase chain reaction (PCR) technology to diagnose and identify adenovirus. Currently, there is no test to retrograde analyze samples from affected patients to proof that the patients were infected with adenovirus. We hope this study will open the eyes of researchers to take random samples from adenovirus outbreaks. This might help to identify the strains causing punctal stenosis. Another limitation relies in the natural history of the disease. It is not clear whether epiphora can resolve alone without intervention. Since, we primarily do offer interventional treatment for all our cases.

In summary, adenovirus might be a potential cause of punctal occlusion. We recommend using punctal plugs as a primary therapy for every patient with punctal stenosis. Insertion of Mini-Monoka tube for resistant cases can be of great help in resistant cases. Finally, more studies are needed to proof the relation of punctal stenosis as a complication of viral conjunctivitis, and discover the serotype of adenovirus responsible for this problem.

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