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Original research

A prospective randomized study comparing incision and curettage with injection of triamcinolone acetonide for chronic chalazia

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Abstract

Purpose: To compare outcomes of intralesional triamcinolone acetonide (TA) injection and incision and curettage (I&C) in the treatment of chronic chalazion.
Methods: Patients with chronic chalazion were randomized in two groups. The patients in the TA received an intralesional injection of TA and patients in the I&C underwent I&C. The patients were followed up 3, 7, 14, 21, 28, and 45 days after the procedures. We defined success as 90% regression in the size of the lesion.
Results: There were 26 patients in the TA and 25 patients in the I&C enrolled in this study. Complete resolution was achieved in 16 patients (61.5%) in the TA group and 21 patients (84%) in the I&C ($P = 0.072$). Sex, initial size, and chalazion location did not influence treatment success in either group ($P > 0.05$). Lesion recurrence occurred in 9 patients (34.61%) in the TA group and 2 (8%) in the I&C ($P = 0.04$). The average times to resolution were 8.8 ± 5.6 and 5.1 ± 4.5 days in the first and second groups, respectively ($P = 0.03$). Drug deposition occurred in 24 (92.3%) patients in the TA group, and ecchymosis occurred in 14 (56%) patients in the I&C ($P = 0.004$) group. Intraocular pressure (IOP) in the TA group and visual acuity (VA) in both groups remained unchanged.
Conclusions: Both TA injection and I&C modalities are effective in the treatment of chronic chalazia. Advantages of I&C in comparison to TA include less recurrence, shorter duration of complications, and a higher success rate.

Keywords: Chalazion; Triamcinolone; Curettage

Introduction

Chalazion is a common chronic sterile lipogranulomatous mass in the eyelid that is the result of obstruction of the meibomian glands. It could involve one or both sides and any part of the superior or inferior lids in all age groups.[1] Chalazia is the most frequent cause of eyelid masses in all ages and is more common in females.[2] Chalazion may cause cosmetic disfiguration, local eye symptoms such as irritation and inflammation, and visual symptoms such as refractive errors and amblyopia in children, blurred vision secondary to induced astigmatism or mechanical ptosis, and rarely conjunctivitis or cellulitis.[1,3,4]

In the acute phase, conservative therapy includes warm compresses and antibiotic or corticosteroid ointments. Previous studies have reported a 25–50% resolution rate for these conservative methods.[5–7] Two standard treatment methods for

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chalazion are intralesional triamcinolone acetonide (TA) injections and incision and curettage (I&C). The complications of TA injections are local skin depigmentation and atrophy, retinal and choroidal vascular occlusion in rare cases, anterior segment ischemia, and inadvertent penetration of the globe.[8–10] I&C is a minor procedure performed under local anesthesia or even general anesthesia in children, and it is considered an effective treatment for chalazion. Various results have been reported about success rates, advantages, and disadvantages of the two methods.[4,10–12] Therefore, we conducted a prospective randomized study to compare the outcomes of the two chalazion treatment methods.

Methods

All patients with chronic chalazion that attended the Nikookari Eye Hospital from September 2015 to March 2017 were enrolled in this clinical trial (IRCT201606156033N5). The study was approved by the Ethics Committee of Tabriz University of Medical Sciences (Ref No: 9395). Informed written consent was obtained from the patients or their parents at the beginning of the study. From the literature, it was assumed that a 90% success rate could be obtained using I&C, and a 60% cure rate for the injection was considered feasible. The study was powered at 80% to detect a significant difference between the proportions of successful outcome in the groups with an α level of 0.05 and β of 0.2. The group size needed to be 25 in each group.

Patients were randomly assigned (double blind randomization) into the two groups: intralesional injection of 4 mg triamcinolone acetonide (Trilon, Sina Darou) (TA) and incision and curettage (I&C). We defined chronic chalazion as masses with a minimum duration of one month that were unresponsive to medical treatment. Exclusion criteria were patients with chalazia that had atypical features, multiple chalazia on one eyelid, concurrent eyelid infection, and history of previous treatment. One surgeon (R.N.) carried out all the injections and surgeries, and other colleague (H.S.) performed follow-up visits.

In the TA, intraocular pressure (IOP) was recorded, and in both groups, visual acuity (VA), chalazion size (by ruler), duration and location, occurrence and time to resolution of complications (drug deposition and ecchymosis), sex and age distributions, lesion recurrence, success rate (more than 90% lesion size regression), and time to resolution were recorded. All patients followed up for at least 45 days, and regular visits were scheduled on days 1, 3, 7, 14, 21, 28, and 45. When available, the patients followed up for a longer duration.

Lesions were categorized into two groups based on the location of the chalazia on the upper or lower eyelids. Each of these two groups was further classified into three subgroups: medial, middle, and lateral one-third. The chalazia were divided into two groups from the size standpoint: large ($\geq$8 mm) and small (<8 mm). Successful treatment was defined as at least a 90% reduction in the size of a lesion without any recurrence after the first procedure of each method. Incomplete resolution (less than 90% lesion size regression) or recurrences were considered treatment failures. Lesions with incomplete resolution or lesions that recurred after complete resolution in each group were dealt with using two methods. If the chalazion size was equal or more than 5 mm, the patient underwent the TA injection, and the smaller lesions were treated with conservative therapy.

In the TA group, after topical anesthesia with eye drops (tetracaine), an intralesional injection of 0.1 ml TA with a concentration of 40 mg/ml was done transcutaneously by using a 27-gauge needle. In the I&C group, after local anesthesia of the eyelid by injecting 1 ml of lidocaine 2% performed in an outpatient surgery room and under sterile conditions, the eyelid was everted using a chalazion clamp, and a vertical incision was made over the lesion. After careful curettage, the clamp was opened, corticosteroid and antibiotic ointments were applied, and the eye was bandaged for 24 h.

Normal distribution of data was analyzed by Kolmogorov-Smirnov test. Independent samples *t*-test was used to analyze data with normal distribution, and non-normal distributed data were analyzed by Mann-Whitney. Qualitative variables were analyzed using chi-squared test (by method Monte Carlo), and the two groups were compared by independent samples *t*-test. A *P*-value of <0.05 was considered statistically significant.

Statistical analysis was performed using Microsoft Excel and Statistical Package for the Social Sciences (SPSS) Version 17 (IBM).

Results

Of 82 patients assessed for eligibility, 17 patients were excluded. Eight of these patients had not met inclusion criteria, 5 refused to take part in the study, and 4 were excluded because of involvement of both eyelids. The remaining 65 patients were allocated into two groups (32 in TA and 33 in I&C). Six patients in TA and 8 in I&C were missed to follow-up. Twenty-six patients in TA and 25 in I&C were analyzed.

In total, 51 patients (13 male and 38 female) with chronic chalazia were enrolled in this study (Table 1). The TA group included 26 patients (8 male and 18 female), and the I&C group included 25 patients (5 male and 20 female). There was not any statistically significant difference between sex distributions in the two groups ($P = 0.28$), and there was not a

Table 1
Pre-operation demographic data of the patients.

	Group 1 (TA)	Group 2 (I&C)	*P*-value
Number	26	25	
Age (year) (mean ± SD)	25.5 ± 9.1	29.6 ± 16.6	0.27
Gender N (percent)			
Male	8 (30.7)	5 (20)	0.28
Female	18 (69.3)	20 (80)	
Size (mean ± SD)	7.6 ± 1.8	8.2 ± 2.07	0.44
Duration (month) (mean ± SD)	5.8 ± 4.6	4.3 ± 3.2	0.18

TA: Intralesional triamcinolone acetonide.
I&C: Incision and curettage.
SD: Standard deviation.

correlation between sex and success rate in either the first ($P = 0.23$) or second ($P = 0.57$) group. Patients were between 14 and 64 years of age with a mean age of 25.5 ± 9.1 in the TA group and 29.6 ± 16.6 in the I&C group. The difference between age distributions in the two groups was not significant ($P = 0.27$). Success rates were 61.5% (16 patients) and 84% (21 patients) in Groups 1 and 2, respectively, which was not statistically significant ($P = 0.072$). Three patients, including one patient (3.85%) in the TA group and 2 patients (8%) in the I&C group had incomplete resolutions ($P > 0.05$). Recurrence was observed in 11 patients, including 9 patients (34.61%) in the TA group and two patients (8%) in the I&C group, and the difference was significant ($P = 0.04$) (Table 2).

Amongst 10 failed treatments in the TA group, the size of the lesions was less than 4 mm in 2 patients and equal to or more than 5 mm in 8 patients. In small lesions (≤5 mm), conservative treatment was used, and in larger lesions (≥5 mm), TA injections were performed. All 10 patients responded to treatment. In the I&C group, in all failed treatments (4 patients), the size of the lesions was ≤4 mm, and these were cured by conservative treatment.

The initial sizes of chalazia were between 5 and 16 mm, with a mean of 7.9 mm. The mean initial size of chalazia for the first and second groups was 7.6 ± 1.8 mm and 8.2 ± 2.07 mm, respectively ($t = 0.7$, $P = 0.44$). In the first group, there were 13 large (≥8 mm) and 13 small (<8 mm) lesions, and I&C was comprised of 17 large and 8 small lesions. However, there was not any statistically significant difference between the chalazion size and treatment success rates in the first ($P = 0.23$) and second groups ($P = 0.57$).

The mean duration of chalazia was 5.8 ± 4.6 and 4.3 ± 3.2 months in Groups 1 and 2, respectively ($P = 0.18$).

Lesions were assorted into 6 groups based on the location of chalazia on the eyelid. Chalazia location distribution in the two groups did not have significant differences ($P = 0.64$). Chalazia location had no significant effect on the success rate ($P = 0.25$ and $P = 0.2$ in TA and I&C, respectively). The mean patient follow-up duration in the TA group was 3.73 ± 1.3 months and 2.8 ± 0.6 months in the I&C group. It was significantly higher in the TA ($P = 0.003$).

VA without any changes was 10/10 in all patients before and after the two procedures.

IOP was measured before the injection and in follow-up visits. The mean IOP before injection of TA and on the 45th day were 13.69 ± 1.93 mmHg and 13.15 ± 1.80 mmHg, respectively ($P \sim 1$).

The average time to resolution was 8.8 ± 5.6 days for the TA group and 5.1 ± 4.5 days for the I&C group, which was statistically significant ($P = 0.03$).

The only complications of this study were drug deposition in the TA group and ecchymosis in the I&C group. Deposition was observed in 24 patients (92.3%) in the TA group, and ecchymosis happened in 14 patients (56%) in the I&C group. The complication rate in the TA group was statistically significant ($P = 0.004$). The mean duration of the deposits in the TA group was 17.6 ± 13.8 days, and the mean duration of ecchymosis in the I&C group was 4.9 ± 3.1 days ($P < 0.001$, $t = 3.36$).

Table 2
Post-operation data of the patients.

	Group 1 (TA)	Group 2 (I&C)	*P*-value
Time to resolution (days) (mean ± SD)	8.8 ± 5.6	5.1 ± 4.5	0.03
Incomplete resolution N (percent)	1 (3.85%)	2 (8%)	>0.05
Recurrence N (percent)	11 (34.61)	2 (8)	0.04
Overall success N (percent)	16 (61.5)	21 (84)	0.07
Follow-up (month) (mean ± SD)	3.73 ± 1.3	2.8 ± 0.8	0.003

TA: Intralesional triamcinolone acetonide.
I&C: Incision and curettage.
SD: Standard deviation.

Discussion

In our study, it was shown that both intralesional TA injection and I&C were effective treatment modalities for chronic chalazia with success rates of 61.5% and 84%, respectively, which were not statistically significant. However, the success rate of I&C was clinically higher than that of TA injection.

Previous studies reported 50–95% success rates for steroid injections.[3,6] Ben Simon and colleagues' studies showed intralesional TA injection was as effective as I&C in primary chalazia.[4,11] Goawalla and Lee suggested that a single TA injection followed by eyelid massage is almost as effective as I&C in treatment of chalazia with similar patient satisfaction and less pain and patient inconvenience.[10] Other studies reported higher rates of resolution after one to three steroid injections regardless of the duration and consistency of the lesion.[6,10,11] The results of a study by Dhaliwal and Bhatia showed that I&C is a good therapeutic choice for all chalazia and that it could be replaced by TA injection when I&C is refused and in difficult lesions, such as lesions near the canalicular system and lid margin.[12] Moreover, it can be useful in children, particularly those with mental disability.[13]

Khurana et al. reported that intralesional steroid injection in small, multiple, and marginal chalazia is equally effective as I&C while large lesions had better responses to I&C.[14] Dhaliwal and Bhatia showed a correlation between histologic analysis of the lesion and treatment outcome after intralesional TA injection or I&C. Based on this study, older patients, large lesions, and lesions of longer duration that were more likely to be the suppurating granulomas histologic type responded better to I&C. In their study, mixed-cell granulomas had equal responses to the both therapeutic methods.[12]

Unlike previous studies, in our study there was not any correlation between the mean size and duration of chalazia with success rates in both groups.[4,12] Our results showed that the recurrence rate in the TA group (34.61%) was significantly higher than the I&C group (8%). In addition, recovery time was longer in the TA group. In previous studies, recurrence occurred in 4.5–17% of cases after intralesional injection of 5 mg/ml triamcinolone. In another study, recurrence of 3% was reported after successful I&C.[4,11–13]

Topical and subconjunctival corticosteroids may cause increased IOP or skin depigmentation.[8,9,15,16] To reduce risk of this complication, researchers used various concentrations of TA. Indeed, even with a lower concentration of injected TA (5 mg/ml), the effectiveness of this method has been reported. Kim et al. used various concentrations of TA injections and found no significant difference in success rates.[15] We encountered no IOP rise or skin depigmentation after TA injection. With increasing concentration of TA, the risk of drug deposition may have increased. Goawalla used 0.2 ml with a concentration of 10 mg/ml and did not report any adverse effects such as skin depigmentation or deposits.[10] Factors like race and the color of skin may influence deposition. We encountered a higher rate of deposition (92%). We speculated that despite careful intralesional injection of TA, sometimes a small amount of TA may be leaked out of the lesion. In addition, TA deposition in the TA group took a longer time to resolve than ecchymosis in the second group; therefore, to get a faster response, I&C is a better option.

In the TA group, 8 of the patients who failed to resolve after first injection of TA, responded completely to the second injection. Our study design was to compare the response after one injection. If we compared the success after the second injection, the result would have been completely different.

Our study had some limitations. The main one was small numbers of patients. We used a ruler to measure the size of the lesion. Although we did it carefully and reliably, it may be preferable to estimate the size by digital photography. Furthermore, our follow-up time was short. In a longer time, some cases of depigmentation might have occurred.

In conclusion, both TA injection and I&C modalities are effective in chronic chalazia treatment. Advantages of I&C in comparison to TA include less recurrence, shorter duration of complications, and higher success rates with less time to resolution.

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