

Management of chalazion in pediatric patients by intralesional triamcinolone acetonide injection

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Abstract

Aims: To investigate the safety and efficacy of intralesional triamcinolone acetonide injection in the treatment of chalazion in pediatric patients not responding to conservative treatment.

Methods: This was a retrospective case series conducted in a single ophthalmology centre in Hong Kong. Medical records of all patients under the age of 18 years who received intralesional triamcinolone acetonide injection by a single surgeon for primary chalazion, not responding to conservative treatment for more than 1 month, were reviewed. They were given triamcinolone acetonide injections at doses ranging from 2 mg to 6 mg (40 mg/mL) titrated according to the size of lesion. Main outcome measures included time to resolution, time to 50% reduction in size, and complications from treatment.

Results: From January 2012 to March 2013, 17 patients under the age of 18 years were treated with intralesional triamcinolone acetonide injection by a single surgeon. Overall, 70.6% (12/17) of chalazia achieved a 50% reduction in size in 2 weeks and 76.5% (13/17) achieved complete resolution in 6 weeks. The mean ($\pm$ standard deviation) time to resolution was 18.2 ± 11.0 days. No complications were noted from the injections. Three cases (17.6%) subsequently required incision and curettage, and one case (5.9%) received a second triamcinolone acetonide injection before complete resolution could be achieved.

Conclusion: Intralesional triamcinolone acetonide injection is a safe and effective office-based procedure for the treatment of primary chalazion in children who fail to respond to conservative treatment.

Key words: Chalazion; Child; Steroids; Triamcinolone acetonide

Introduction

Chalazion is one of the most common eyelid pathologies in childhood.¹ It is a chronic lipogranuloma caused by obstruction of the meibomian gland orifices and stagnation of meibomian secretions.² Although these lesions are usually benign and self-limiting, large lesions, in addition to cosmetic disfigurement, may lead to mechanical ptosis, corneal astigmatism, amblyopia, and secondary infection.³⁻⁶ Standard conservative treatment of chalazion includes eyelid hygiene, warm compression, and topical antibiotic eye drops, occasionally requiring systemic antibiotics for secondary cellulitis. Surgical management includes incision and curettage (I&C) or total excision, intralesional steroid injection, and carbon dioxide laser treatment.⁷⁻⁹ It is particularly challenging to perform I&C in children as the procedure is painful despite local anesthesia. Apart from the psychological aversion to surgery, children may also be uncooperative during the procedure, thus, increasing the risk associated with surgery and occasionally, necessitating the use of general anesthesia. The aim of this study was to investigate the safety and effectiveness of intralesional triamcinolone acetonide (TA) injection in the treatment of chalazion in pediatric patients not responding to conservative management.

Methods

This was a retrospective case series conducted at Caritas Medical Centre in Hong Kong SAR, China, from January 2012 to March 2013. Patient medical records were reviewed for all subjects who underwent intralesional TA injection for chalazion by a single surgeon (SKY) during the study period. Consecutive subjects with a diagnosis of chalazion who consented for intralesional TA injection after failure of conservative treatment with lid hygiene, warm compression, and antibiotic ointment (chloramphenicol 1%; Shanghai Sunway Pharmaceutical Technology Co., Ltd., Shanghai, China) 3 times per day for at least 1 month were included. Exclusion criteria are described in **Table 1**. This study received ethics approval by the institutional review board of the Hospital Authority, Hong Kong. Informed consent was obtained from the parents or legal guardians before performing the procedure.

Data regarding duration of symptoms as well as the size and location of the chalazia were documented. Digital coloured photographs of the chalazia were taken at every visit. The visual acuity, a complete ophthalmological examination, and intraocular pressure (IOP) measurements by non-contact tonometry were performed before and after the injection. For cases with failed non-contact tonometry, the Tono-Pen AVIA (Reichert Inc., New York, US) applanation tonometer was used for IOP measurement.

Technique of triamcinolone injection

Topical anesthesia (proparacaine 0.5%) eye drops were instilled in the affected eye before the injection. A volume of 0.05 to 0.15 mL of TA (40 mg/mL) [Stacort-A, Stanard

Chem & Pharm Co., Ltd, Tainan City, Taiwan] was injected intralesionally according to the size of the lesion (**Table 2**). A single surgeon administered all the intralesional TA injections in the outpatient treatment room. The eyelid was everted and TA was injected transconjunctivally into the center of the lesion with a 27-gauge needle. No patching was required after the procedure. The patients were given chloramphenicol 1% eye ointment 3 times per day to apply over the lesion and advised to continue warm compression for 4 to 6 times per day for 10 minutes each with a hard boiled egg. For uncooperative children, sedation with oral chloral hydrate (50 mg/kg) was given 30 minutes before the procedure.

The patients were reviewed on day 3, day 7, day 14, then every 2 weeks after TA injection until complete resolution of the chalazion. Failure was defined as absence of maximal chalazion diameter reduction at 2 weeks after TA injection. Failure cases were offered I&C or a second intralesional TA injection. Main outcome measures included size of the chalazion during each follow-up interval, time taken for a 50% reduction in the chalazion size, time taken for complete resolution, and complications from the procedure. The secondary outcome measures included side-effects of the injection: skin discoloration, IOP elevation, and vascular occlusion. All values were expressed as mean $\pm$ standard deviation (SD).

Results

During the study period, 17 subjects under the age of 18 years were recruited for the study including eight (47.1%) males and nine (52.9%) females. All patients were of Chinese ethnicity and the mean ($\pm$ SD) age was 7.40 ± 5.30 years (range, 2–17 years). Each subject had only one chalazion. Patient demographics are summarized in **Table 3**.

The mean duration of symptoms at the time of presentation was 2.7 ± 2.8 months (range, 1 to 12 months). Six (35.3%) patients had a chalazion measuring less than 1 cm in diameter, 10 (58.8%) had a chalazion with diameter ranging from 1 to 1.5 cm, and there was one (5.9%) patient who had a chalazion larger than 1.5 cm in diameter. They were given a dosage of intralesional TA of 2 mg, 4 mg and 6 mg, respectively, titrated according to the size of the lesion (**Table**

Table 1. Exclusion criteria	
Concurrent eyelid infection	
Duration of <1 month	
Absence of a palpable lid chalazion	
Recurrent chalazion	
Atypical features that may indicate suspicion of malignancy	
History of steroid-induced–raised intraocular pressure	
Defaulted follow-up	

Table 2. Dosage of intralesional TA injection and outcome of treatment according to size of lesion			
	<1 cm (n=6)	1-1.5 cm (n=10)	>1.5 cm (n=1)
Dosage of intralesional TA injection (mg / mL)	2 / 0.05	4 / 0.1	6 / 0.15
Distribution by size of chalazion (%)	35.3	58.8	5.9
% of chalazia that resolved after a single TA injection	95.5	72.0	100 (only 1 case)
% of chalazia that required secondary I&C	0	30	0
% of chalazia that required a second TA injection	0	10	0
Time taken for complete resolution (days)	$20.2 \pm 13.8^*$	$17.5 \pm 9.9^*$	14.0

Abbreviations: I&C = incision and curettage; TA = triamcinolone acetonide.

* Mean $\pm$ standard deviation.

Table 3. Patient demographics (n=17)	
Characteristics	No. of patients*
Gender	
Male	8 (47.1%)
Female	9 (52.9%)
Age range (years)	2-17
Location	
RUL	2
RLL	9
LUL	4
LLL	2
Size (maximal diameter in cm)	
<1	6
1-1.5	10
>1.5	1

Abbreviations: RUL = right upper lid; RLL = right lower lid; LUL = left upper lid; LLL = left lower lid.

* Unless otherwise stated.

2). No complication was observed in any of the cases.

Complete resolution was achieved in 76.5% (13/17) of chalazia that received intralesional steroid injection. There was 50% reduction in size in 2 weeks in 12 (70.6%) chalazia and complete resolution in 6 weeks in 13 (76.5%) patients (**Figure**). The mean time to resolution was 18.2 ± 11.0 days (median, 14 days). Three cases (17.6%) failed to respond and subsequently required I&C. One case (5.9%) received a second dose of TA injection and achieved complete resolution 2 weeks later. All the four cases that did not respond to TA injection belonged to the group of chalazia ranging from 1 to 1.5 cm in diameter (**Table 2**).

Discussion

Chalazion is one of the most common eyelid pathologies encountered in children.¹ As such, chalazia are usually only of cosmetic concern. However, in children, large lesions can compress on the cornea resulting in astigmatism, mechanical ptosis, and even amblyopia.³⁻⁶ Based on previous studies,^{2,10,11} only 29% to 80% of chalazia resolved with conservative treatment alone. When non-surgical treatments fail, the gold standard therapy is I&C of the involved meibomian gland. Possible complications of I&C include bleeding, scarring and lid notching, granuloma formation and, rarely, trauma to the eyeball and surrounding structures.¹²⁻¹⁴ I&C is a comparatively longer surgery and requires patching after the procedure.

An alternative to I&C in the management of chalazion is injection of TA directly into the lesion. This is a quick and office-based procedure, and can be performed in eyes with multiple chalazia as well as in lesions that are close to the lacrimal punctum. Overall, 76.5% (13/17) of our pediatric patients who received intralesional TA injection achieved complete resolution of their chalazia at a mean of 18 days.

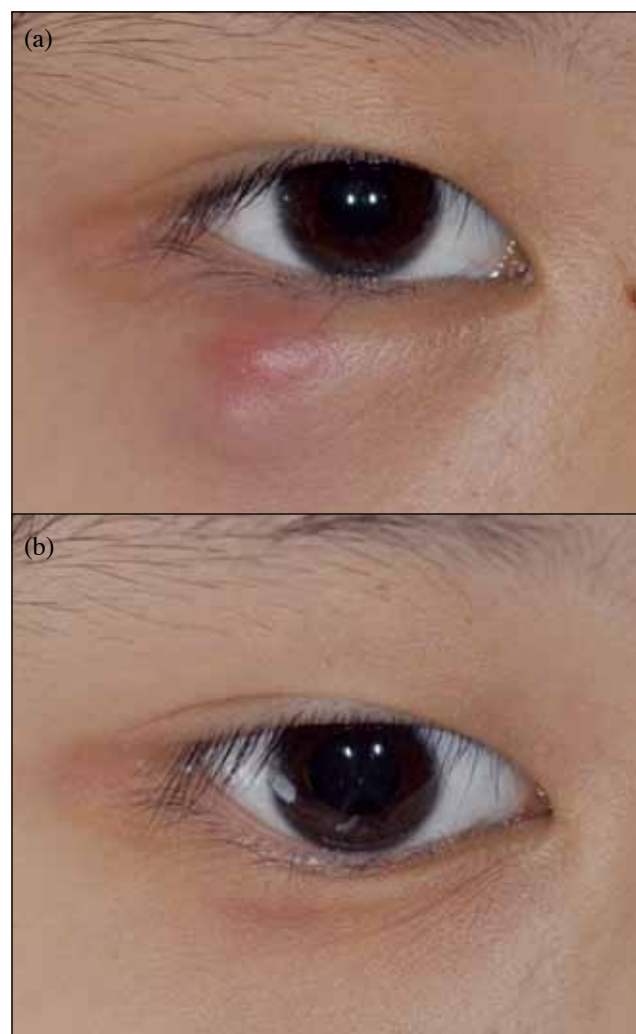


Figure. (a) A patient with a right lower lid chalazion. (b) Complete resolution of lesion 2 weeks after a single triamcinolone acetonide injection.

In most of them, there was resolution of lesion after one TA injection except in one patient who needed a second intralesional TA injection.

In our study, we titrated the dosage of the steroid injection according to the size of the lesion and this appeared to be effective for managing chalazia of less than 1.5 cm in diameter. For larger lesions between 1 and 1.5 cm, 60% achieved complete resolution with a single TA injection of 4 mg and one case received a second TA injection and achieved complete resolution in 2 weeks, whilst the other three cases received I&C subsequently. Palva and Pohjanpelto¹⁵ have previously shown in their study that larger lesions were associated with a lower rate of resolution by intralesional steroid injection and higher rate of recurrence; these findings are consistent with ours. In our case series, only one patient had a chalazion with a diameter of larger than 1.5 cm, and this lesion achieved complete resolution after a single steroid injection. Thus, it is difficult to draw a conclusion on the effectiveness of intralesional TA injection in lesions over 1.5 cm in diameter.

Previous studies have shown that intralesional steroid injection for chalazion achieved similar results in terms of success rates (62%-92%) when compared to those with I&C (79%-90%) in adult patients.¹⁵⁻¹⁸ Mustafa and Oriafage¹⁹ reported that 75% of children achieved complete resolution 2 weeks after a single TA injection whilst 75% resolved after I&C; 100% of those receiving both intralesional TA injection and I&C achieved resolution. In our case series, the mean time of resolution was 18 days which is in line with that in a previous study by Pavčić-Astalos et al²⁰ who reported a complete resolution of chalazia in a mean time of 15.3 days after 4 to 8 mg TA injection.

No complications were noted in our case series. Known complications of intralesional TA injection include raised IOP, skin pigmentary changes, and yellow deposits at the site

of injection.²¹ Other rare complications such as inadvertent globe penetration, traumatic cataract, microembolization and infarction of the retinal and choroidal vasculature have also been reported.^{22,23}

Our case series is a retrospective study carried out in a single centre. Limitations of our study include lack of randomization and control group, with inclusion of mainly small-to-medium-sized lesions. Nonetheless, our study has shown that intralesional steroid injection can be safely and effectively performed in children. It is a quick and simple procedure compared to I&C, requiring minimal time and facilities. It is particularly beneficial to perform such a procedure in the pediatric group and may be considered an alternative treatment for management of chalazia that do not respond to conservative treatment.

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