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## Original Research Article

## Comparison of intralesional injection of triamcinolone - 40 mg/ml and Triamcinolone -10 mg/ml in treatment of chalazion

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## ABSTRACT

**Aim:** A prospective, randomised and comparative study to compare the efficacy and complications of triamcinolone acetone (TMA) 40mg/ml with TMA 10mg/ml in treatment of Chalazion.

**Material and Methods:** Sixty chalazion patients were randomly grouped into two groups. Group A patients received single intralesional injection of 0.2ml TMA 40mg/ml and group B 0.2ml of TMA 10mg/ml. The outcome and complications are evaluated at the end of 6 weeks.

**Results:** There were 60 chalazion from 58 patients, two patients with bilateral chalazion. There were 28 chalazion in group A and 32 chalazion in group B. Over all cure rate was 68.3% (41/60) and comparable to earlier study (P=0.70). The success rate of 78.6% (22/28) in group A is significantly more than the success rate of 56.3% (18/32) in group B (P=0.05). The cumulative complications are marginally more in group A 14.3 % (4/28) (7.2% with raised intraocular pressure (IOP) of >15 mmHg and 7.2% with cosmetically blemish yellow white deposit in skin) compare to 6.3% (2/32) in group B (cosmetically blemish yellow white deposit in skin) (P=0.41).

**Conclusion:** Single dose of intralesional injection of higher concentration of TMA 40mg/ml is more effective than TMA 10mg/ml. However vision threatening complication of raised IOP and Aesthetical dissatisfaction due to yellow white deposit in the lid skin are the disadvantages. Glaucoma comprehensive eye examination and repeated counseling sessions in cosmetically anxious young female patients to be kept in mind.

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### 1. Introduction

Chalazion is a sterile chronic granulomatous inflammatory lesion of the meibomian gland or some time Zeiss gland caused by retained sebaceous secretion. It is believed to be from the blockage of the meibomian gland orifice or stagnation of the meibomian gland secretion. Persons who rub their eye frequently, patients with blepharitis and acne rosacea are more frequently develop chalazion. Common presentation is chronic swelling without any inflammatory symptoms or signs. However it may present as acute painful swelling when secondarily infected.<sup>1,2</sup> Complications of chalazion are going to hordeolum internum following secondary infection,<sup>1</sup> Cosmetic blemish, Astigmatism

and mechanical ptosis<sup>3</sup> and hyperopia.<sup>4</sup> The commonest indication for chalazion treatment is cosmetic blemish.<sup>3</sup>

Common modalities of treatment for chalazion are Simple observation with hot moist compression,<sup>5</sup> Conservative management by hot moist compression, meticulous lid hygiene with topical antibiotic or antibiotic steroid medication for a period of six weeks,<sup>5,6</sup> intralesional depot steroid injection,<sup>7</sup> Surgical intervention (incision-curettage, subconjunctival excision and tarsal trephination),<sup>2,8</sup> and combined surgery with intralesional steroid injection,<sup>9</sup> Also uncommon procedures like Co2 laser treatment followed by curette,<sup>10</sup> intralesional injection of Botulinum toxin – A<sup>11</sup> and Low level light therapy.<sup>12</sup>

Advantages of intralesional TMA injections are simple outpatient department (OPD) procedure, no anesthesia injection requirement, minimal bleeding, no post procedure

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scarring, multiple chalazion can be treated at a time, easy to treat chalazion near punctal area and useful in children and anxious patients.<sup>2,3</sup> Many studies have been done on the efficacy and complications of TMA injection with various concentration and number of injections,<sup>6,7,13</sup> comparing the response with size of the chalazion,<sup>14</sup> duration of the chalazion,<sup>5,6</sup> gender and between different age group.<sup>3</sup> We have failed to find any literature on comparing the two concentration of triamcinolone (TMA) 40mg/ml and 10mg/ml in treatment of chalazion in journals, Medline and Pubmed on line search. This prospective and comparative study was taken to compare the efficacy and complications of two concentration of TMA 40mg/ml and 10mg/ml in treatment of chalazion.

## 2. Materials and Methods

This study was conducted at a secondary care Eye hospital in Chamrajanagara town in Karnataka state from August 2017 to January 2020. Patients who are reporting to Ophthalmology out patient department are enrolled. All patients were explained about the risk and benefit of the procedure and informed consent was taken. In case of minors and mentally disabled patients from surrogate parents. The study was approved by the review and ethics committee of the Hospital. Patients who have received TMA injection of any strength < 6 weeks before enrollment, having more than one chalazion in each eye and recurrent chalazion were excluded from the study.

All patients demography and detailed history recorded. Comprehensive eye examination details recorded with pre and post procedure photography.

### 2.1. Measurement of chalazion

As described by Watson.et.al.<sup>7</sup> Patients were placed in supine or sitting position, requested to close the eye gently while looking straight ahead or at the ceiling. Skin of the involved lid gently stretched. Measurement was taken from skin aspect at the maximum diameter of chalazion with Castroviejo caliper. Then patients were randomly distributed to group A who will receive single injection of 0.2ml TMA 40mg/ml (Kenacort, Abbott Health care Pvt. Ltd, Mumbai, India) and group B 0.2 ml TMA 10mg/ml (Kenacort, Abbott Health care Pvt. Ltd, Mumbai, India) through conjunctival route. In difficult situation where conjunctival route was not possible transcutaneously injected.

## 3. Method of injection

Injection was given as described by Watson.et.al.<sup>7</sup> with following modification. 1. 4% Lignocaine hydrochloride topical anesthesia drop used 2. Insulin syringe with 27 G needle was used 3. 0.2 ml of non diluted TMA 40mg/ml and 10mg/ml was injected 4. In apprehensive patients

skin route was used (2 cases in group A and 3 cases in group B). 5. Only one injection was given and the eye was padded for 30 minutes. Topical Gatifloxacin eye drop 4 times daily for a week and no other oral medicines used. Patients were re – examined at 1<sup>st</sup> week, 2<sup>nd</sup>, 4<sup>th</sup>, and 6<sup>th</sup> weeks. During each visit subjective satisfaction on; resolution of chalazion and cosmetic blemish, size of the chalazion and IOP measurement (in risk patients). Cure was considered by subjective and objective observation at 6 weeks. Subjectively: Aesthetically satisfied and objectively: reduced size of chalazion by 80% or size < 1mm size.

Recurrence was considered when the chalazion was palpable in the lid or measured more than 1 mm, patient felt there is visible or palpable swelling in the lid within the observation period.<sup>7</sup> These failed cases were treated with surgical incision and curettage with one injection of 0.2ml non diluted 10mg/ml TMA. These cases were not included in success rate. The result after 6 weeks of follow up are tabulated and analyzed by 2020 Statistical Software (2020). NCSS, LLC. Kaysville, Utah, USA, and displayed in mean with standard deviation (SD). The probability by single sample student 't test and Fisher exact test and statistical significance with exact P value.

## 4. Results

There were 60 chalazion in 58 patients. The mean age was 18.4+/- 9.8 years youngest is 6 yrs old female child and eldest is 46 yrs old male. There were 50% (29/58) males and 50%(29/58) females. Right eye was involved in 50% (30/60) and 50% (30/60) in left eye. The mean size of the chalazion was 8.3 +/-3.0 mm range from 5 mm to 16 mm. Duration of the chalazion was from 4 weeks to 38 weeks (Table 1). Two female patients one 6 years old child and another 34 years old woman had two chalazion one each in right and left upper lid (Figure 1). In both these patients right eye received TMA 40mg/ml and to left eye TMA 10mg/ml injection.

Overall success rate was 68.3 % (41/60) at the end of 6 weeks. Drop out rate was 8.3% (5/60) after 3 week follow up, 16.7% (10/60) had recurrence at 3 week follow up and 6.7% (4/60) had yellow white deposit in the eye lid skin even after 6 weeks follow up. Recurrence cases were treated with incision and curettage with one injection of 0.2ml of TMA 10mg/ml. Cumulative complication of 10% (6/60); yellow white deposit in the lid skin 6.7% (4/60) and raised IOP > 15 mmHg in 3.3% (2/60) were present at the end of 6 weeks. Patients with yellow white deposit are surgically removed and all four were not happy with the procedure. These 19 cases are excluded from the statistical analysis. Raised IOP >15 mmHg from base line in two patients were treated with beta blocker. One patient IOP controlled to <21 mmHg after 6 weeks and another patient converted to steroid induced glaucoma.

There were 46.7% (28/60) chalazion in group A and 53.3% (32/60) in group B. patients drop out is 7.1% cases

(2/28) in group A and 9.3% cases ( 3/32) in group B at the end of 2<sup>nd</sup> week follow up. These patients were not considered in success rate.

There is no considerable difference in mean age, gender, laterality and size of the chalazion between two groups (Table 1) The success rate was 78.6% (22/28) in group A and 56.3% (18/32) in group B (P= 0.05). The dropout rate of 7.1%(2/28) cases in group A and 9.3% ( 3/32) in group B are comparable (P=1.00). Recurrence rate was 3.6% (1/28) in group A and 28.1%(9/32) in group B and the difference is also significant (P=0.01) . Yellow white deposit in lid skin seen in 7.1% (2/28) cases in group A and 6.2% (2/32) cases in group B is also comparable (P=1). In group A 7.1% ( 2/28) patients had raised IOP> 15 mmHg from base line at 5 week follow up . Both were above 40 years aged male patients. In one patient IOP normalized with short course of beta blocker and another patient converted to steroid induced glaucoma.

Most of the patients in both group felt some tense sensation in the lid for 15 -30 minutes after injection. Complications like hypopigmentation of lid skin, corneal perforation, cataract, eye lid fat atrophy and posterior segment complications are not observed.

## 5. Discussion

Depot steroid, Triamcinolone acetonide (TMA) has been widely used in many ophthalmic diseases and procedures. As intraoperative injection in external dacrycystorhinostomy,<sup>15</sup> intralesional injection in granulomas after endonasal dacrycystorhinostomy,<sup>16</sup> as retrobulbar injection in management of non responding dysthyroid exophthalmos,<sup>17</sup> in management of diabetic macular oedema,<sup>18</sup> for visualizing Vitreous during vitrectomy,<sup>19</sup> and in treatment of periocular scars.<sup>20</sup> Depot steroid, TMA is a synthetic corticosteroid having 5 times anti-inflammatory action compare to hydrocortisone. It is a long acting anti-inflammatory, Anti Vascular endothelial growth factor (VEGF) and antifibrotic agent.<sup>21</sup> Chalazions are composed with corticosteroid sensitive inflammatory cells and the chemical mediators. They cause inflammatory exudation and compress the lymphatic vessels. This leads to morphofunctional alteration in lymphatic vessels and granuloma formation in the lids. Presumed action of depot corticosteroid is by suppressing additional release of inflammatory cells and reduce exudation of plasma fluids. These factors may releases the compressive effect on the lymphatic and facilitate the lymphatic absorption of contents of chalazion.<sup>22</sup>

First report on use of corticosteroid comes from Leinfeder, who used methyl prednisolone injection to reduce the inflammation of chalazion. The assumption was the chalazion becomes localized and easy for incision and curettage.<sup>7</sup> Subsequently many studies have reported the cure rate from 8.5% to 99.7% with various concentration



**Fig. 1:** a: Showing a young male patient with left eye upper lid chalazion, b: Same patient in a, receiving TMA 40mg/ml injection, c: Showing a young female patient having both eyes upper lid chalazion before injection, d: Showing same patient in c with resolved both eyes upper lid chalazion at 6 weeks after TMA injection, e: Showing a Child having both eyes upper lid chalazion before injection, f: Showing the same child in e with resolved both eyes upper lid chalazion at 6 weeks after TMA injection.

and number of injection.<sup>7,8</sup>

The success rate of 78.6% (22/28) in group A patients is marginally less than the earlier reports. In a prospective study by Pavicic Astalos et al.<sup>13</sup> 37 patients with primary and secondary chalazion received 1 or 2 injection of 0.1-0.2 ml of TMA 40mg/ml and 94.6 % (35/37) had complete resolution of chalazion by 2 weeks . In their study only after 2 injection success rate was 94.6% here we have considered only one injection and the difference is not significant (P=0.06). In an another retrospective study by Wong et al.<sup>23</sup> 48 cases of primary chalazion were treated with medical treatment for a month and later 2- 6 mg of TMA 40mg/ml was intra lesionally injected and 83% (40/48) had resolution by 6 weeks. In this study also more than one injection was given and the difference not significant (P=0.76). In the above two studies,<sup>22,23</sup> higher rate of success was possible after second injection. In our study same success rate was observed with single injection and we suggest single dose TMA may be sufficient.

The success rate of 65.6% (21/32) in group B patients is comparable to earlier reports.<sup>6,8</sup> In an randomized control study by Chung et al.<sup>6</sup> on comparing the outcome

**Table 1:** Showing demography, success rate and complication in total study group, group A and group B

	Total (n =60)	Group A (n= 28)	Group B (n= 32)	P (Between A-B)
Age (Mean in years)	18.4+/- 9.8	19.5+/- 10.2	17.2+/-10.0	P=0.37
Gender Male/Female	29/31	15/13	14/18	P=0.60
Laterality Right eye/Left eye	30/30	16/12	14/18	P=0.31
Mean size (mm)	8.3+/-3.0	8.5+/-3.0	8.4+/-3.0	P=0.41
Mean Duration (in weeks)	17.8+/-9.4	18.6+/-9.4	16.5+/-9.7	P=0.40
Success rate	68.3% (41/60)	78.6.1% (22/28)	56.3% (18/32)	P=0.05
Commutative complications	10% (6/60)	14.3% (4/28)	6.3% (2/32)	P=0.40

on conservative management with extra lesional TMA injection 16 chalazions of 28 chalazions received 0.3 ml of TMA 10mg/ml and 93.8% (15/16) had resolution and the difference is significant (P=0.04). The higher success rate in Chung et al study<sup>6</sup> was possible after receiving more than one injection. Goawalla et al.<sup>8</sup> in their prospective comparative study on 136 cases of chalazion, 56 cases received 0.2 ml of TMA 10mg/ml only 83.9% (47/56) had resolution at 3 week with one or two injection. Even though the difference appears larger but statistically comparable (P=0.06). This confirms that lower concentration of TMA 10mg/ml is also effective in treatment of Chalazion.

The success rate of 78.6(22/28) in group A is higher than group B 65.6%(21/32) and the difference is statically significant (P=0.05). In most of the studies when the success rate was high, available TMA was 6-8 mg with more than 1 injection and low success rate when available TMA was 2- 4mg.<sup>6,8,13,14</sup> In our study group A cases received 8mg TMA and group B 2mg TMA hence there is statistically significant difference (P=0.05). This support the assumption of higher concentration of TMA has better results compare to lower concentration TMA.

Reported complications of depot steroid injection in chalazion treatment are hypo pigmentation/de pigmentation of lid skin,<sup>6,7,24</sup> yellow white deposits in the lid skin,<sup>9</sup> subconjunctival eye lid fat atrophy,<sup>24</sup> second injection,<sup>13,14</sup> corneal perforation with traumatic cataract by injection needle,<sup>25</sup> micro embolism of retinal and choroidal vasculature leading to infarction,<sup>26</sup> steroid induced glaucoma,<sup>7,27</sup> and subcapsular cataract.<sup>7</sup> The commulative complications in our study was 10% (6/60). Yellow white deposit in the skin in 6.6% (4/60) cases and raised IOP of > 15 mm in 3.3% (2/60) cases.

The complication of yellow white deposit in the lid skin is 7%(2/28) and 6%(2/32) in group A and group B respectively and statistically not significant.(P= 1). Prolonged availability of stronger, crystalline and insoluble corticosteroid under the eye lid skin, Very thinnest lid skin and skin complexion of our population may be reason for visibility of yellowish white deposit of TMA. This complication is reported by earlier studies with use of TMA 40mg/ml,<sup>23</sup> TMA 10mg/ml<sup>7</sup> and TMA 5mg/ml injection.<sup>9</sup> This side effect can be observed following conjunctival or transcutaneous route of injection. It is an important cosmetic

blemish in young female patients. Four young female patients two each from group A and group B. All 4 patients under went surgical removal of yellow white deposit and subjectively not satisfied with the procedure. In these type of patients few sittings of counseling or incision and curette may be the better option.

Corticosteroid is known to induce raised intra ocular pressure when used either in topical, subconjunctival, para enteral, oral or inhaled form. In general population 4-5% are strong responders to steroid by showing elevation of IOP > 15 mm of Hg from the base line.This is more so in patients with POAG and their relatives, diabetes and myopics.<sup>27</sup> In group A in 7% (2/28) cases had raised IOP of > 15 mm of Hg. One patient returned to normal IOP and other converted to steroid induced glaucoma. A comprehensive glaucoma eye examination to be done in high risk patients for glaucoma before taking for steroid injection.

The assumption of single injection of higher concentration TMA (40mg/ml) has more positive outcome compare to low concentration TMA (10mg/ml) appears to be proved in our study. Injection of TMA again confirms, it is a simple, economical and cost effective procedure. Very useful in children and patients not willing for surgery. Complications like raised IOP and cosmetic blemish by yellow white deposit in lid skin specially in young female patients are the concern. Pre procedural comprehensive glaucoma examination and good counseling in aesthetically concerned patients is equally important. Our study had following lacunae. It is randomized study, it had only primary chalazion and cannot say the efficacy on recurrent chalazion.

## 6. Conclusion

Single dose of higher strength of TMA is a effective, easy and economical procedure in treatment of chalazion. Complications like steroid induced glaucoma and cosmetic blemish are the concern.

## 7. Conflicts of Interest

All contributing authors declare no conflicts of interest.

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None.

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