Volume 3, Issue 2, 2025

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

A COMPARATIVE STUDY OF SUBCUTANEOUS EXTRALESIONAL AND INTRALESIONAL TRIAMCINOLONE INJECTIONS IN CHALAZION MANAGEMENT

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DOI: https://doi.org/10.5281/zenodo.18311264

Keywords
Chalazion, Subcutaneous Extra Lesional Injection, Triamcinolone

Article History
Received: 04 January 2025
Accepted: 12 February 2025
Published: 24 April 2025

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Abstract

Background: *Intralesional or intralesional triamcinolone acetonide injection is a minimally invasive treatment option. While intralesional triamcinolone therapy is a fast and effective technique, it is technically tough and can cause great discomfort, regularly necessitating the use of topical anesthesia.*

Objectives: *To compare the effectiveness of subcutaneous, intralesional, and extralesional triamcinolone injections in the treatment of chalazion.*

Methods: *The study was a quasi-experimental, post-test design. It involved a six-month randomized control trial in the Department of Ophthalmology of Jinnah Postgraduate Medical Center, Karachi, from 29th January 2022 to 28th July 2022. Total 116 patients of either gender falling in 12 to 50 years age group presenting with chalazion were included. Following patients were excluded from the study: in whom chalazion has recurred after receiving either surgical or steroid injection treatment in the past; in whom chalazion is showing signs of acute inflammation that is tenderness, redness and warmth; who have more than one chalazion involving upper and/or lower lid;in whom chalazion duration is less than 2 weeks; in whom there is history of steroid induced rise in IOP; in whom the chalazion is near the lacrimal punctum. In addition, the Group A patients received Extralesional triamcinolone acetonide injections, while the Group B patients received intralesional injections.*

Results: *The age distribution between Group A and Group B indicated that the number of patients in Group A was 33.71±8.23 years, and in Group B was 35.16 ± 7.71 years. Of all the patients, 80 were aged 41-75 years; most of them were 68.97%. Out of 116 PHTML patients, 72 (62.07%) were males, and 44 (37.93%) were females, which reflected the male-to-female ratio of 1.6: 1. Among the patients in Extralesional triamcinolone injections, 51 (87.93%) were efficacious, and among the patients in intralesional injections, 18 (68.97% were efficacious). The 'p' value was calculated to be 0.013, which was statistically significant.*

Conclusion: *This study concluded that subcutaneous extralesional injection triamcinolone is better as compared to subcutaneous intralesional in the treatment of chalazion.*

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INTRODUCTION

A chalazion is a chronic, non-infectious irritation of the sebaceous glands in the eyelid, specifically affecting the meibomian glands inside the tarsal plate. Clinically, it gives a painless, firm nodule at the eyelid. Marginal chalazia rises due to irritation of the Zeis glands placed at the lid margin, which might expand on both the top and decrease eyelids. Conditions consisting of zits rosacea and posterior blepharitis are usually related to chalazion. Additionally, Hyperimmunoglobulinemia E (Job syndrome) has been connected to aggressive instances of chalazion.

Meibomitis predisposes individuals to chalazion formation by causing ductal blockage, leading to secretion buildup and swelling. Over time, this results in a hardened lesion. Although chalazion is generally a non-infectious situation, secondary contamination can occur, leading to acute infection and a nerve-racking, warm eyelid swelling called hordeolum internum. This connection between meibomitis and chalazion explains its pathogenesis and recurrence.

Histologically, chalazion is a deep dermal or subcutaneous suppurative lipo granulomatous inflammation characterized by neutrophils, plasma cells, lymphocytes, histiocytes, and giant cells organized around a principal lipid core. A pseudo capsule normally surrounds the cellular infiltrate. Most chalazia remedies within two weeks are conservative, consisting of topical antibiotic-steroid medicine and warm compresses, which help reduce irritation and enhance nearby blood circulation.

Patients with acne rosacea and with seborrheic dermatitis, chalazia may be multiple or recurrent. Over 25% of chalazia resolve without treatment. Most persist and need therapy. Conservative therapy involves warm compresses to stimulate drainage and antibiotic eye ointments to avoid subsequent infection. These measures may not improve the chalazion, requiring further treatment. Incision and curettage or intralesional or extralesional injections of long-acting steroids reduce inflammation and speed remission in persistent instances.[9-10]

Several local[3,4] and international 4,5,6 studies have shown intralesional or extra lesional triamcinolone to be an effective and safe treatment alternative to incision and curettage for chalazion with success rates of 62%[3], 92%[4] and 89.6%.[5] Although classical incision and drainage method is an effective method but, given that it is a surgical procedure, it carries a higher risk of developing surgery associated complications,complications related to wound healing and scarring.[11] On the other hand,intralesional or extralesional traiamcinolone acetonide injection is a minimally invasive alternative. Intralesional triamcinolone therapy is a fairly fast way of treating the skin condition, but administering it is not easy. It might be uncomfortable sometimes, which may require applying an anesthetic agent to the affected part. On the other hand, the injections given in the less dense intralesional tissue are less complicated, less risky and less painful than the previous one. This approach reduces the risk of developing complications such as perforating the tarsal plate or cyst's wall. For individuals who cannot tolerate intralesional therapy, subcutaneous injection is chosen due to its simplicity of administration and lesser discomfort.[13]

One such study compared the efficacy of these techniques based on resolution of chalazion and reported the resolution percentages of 84.8%[9] in extralesional group while 82.6%[9] in intra lesional on literature search has been observed by the researcher there are a few number of studies conducted globally as well as locally,result of international study are not applicable as such on our population due to genetic difference exposure,skills and facilities.Results of my study would be helpful in future in selection of both techniques of delivery of triamcinolone acetonide injection.[14]

Objective:

To compare subcutaneous intra lesional and extra lesional injection triamcinolone in the treatment of chalazion among patient visiting ophthalmology department JPMC Karachi.

MATERIALS & METHODS

Jinnah Postgraduate Medical Center's Karachi Department of Ophthalmology conducted a six-month randomised controlled trial. Chalazion

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ISSN: (e) 3007-1607 (p) 3007-1593

therapies were compared using a controlled and evidence-based approach. The study used preset clinical variables to evaluate eligible participants. Ethics and standard procedures were followed to assure research accuracy and dependability. Patient follow-ups, therapy monitoring, and data collection assessed intervention efficacy and outcomes over six months. (i.e 29thJanuary2022to28thJuly2022).

SAMPLE SIZE: by using WHJO sample size calculator for two proportion efficacy in group one extralesional 84.8%[9] where as In second group intralesional 62.0%[4] power of test 80%, level of significance 5%, total sample size of 116 (58 in each group)

SAMPLE TECHNIQUE: Non-probability, consecutive sampling technique.

"Inclusion Criteria"

All patients of either gender falling in 12 to 50 years age group presenting to Eye OPD ophthalmology department JPMC karachi with the presenting complaint of swelling in eye and then being diagnosed of having chalazion between size 2 mm to 12 mm or more than 12mm present for more than 2 weeks who consent for interventional treatment.

Exclusion Criteria:

Following patients were excluded from the study: in whom chalazion has recurred after receiving either surgical or steroid injection treatment in the past; in whom chalazion is showing signs of acute inflammation that is tenderness, redness and warmth; who have more than one chalazion involving upper and/or lower lid; in whom chalazion duration is less than 2 weeks; in whom there is history of steroid induced rise in IOP; in whom the chalazion is near the lacrimal punctum.

DATA COLLECTION PROCEDURE:

Chalazia from 92 patients were recruited in the study from ophthalmology outdoor of jpmc Karachi after getting approval of synopsis from ethical committee. The procedure was explained to the patients and only those who give informed consent were recruited. All patients were undergone the procedure by the same ophthalmologist who has more than ten years of experience of this procedure. Each chalazion's width from the skin surface was measured to the millimeter using a Vernier caliper. Patients were drawn into A or B groups to ensure a randomized selection process. Group A had extralesional triamcinolone acetonide injections, while B received intralesional ones. To improve patient comfort, local anesthesia was given before administration. To reduce pain, 0.5% proparacaine eye drops numbed the conjunctiva. Group B received 0.1 to 0.2 mL of triamcinolone acetonide (10 mg/mL) transconjunctivally at the lesion's centre using a 27-gauge needle, adjusted for chalazion size. Group A received a 25-gauge needle-injected 0.3 mL of triamcinolone acetonide (10 mg/mL) into the subcutaneous tissue above the chalazion. The effectiveness and discomfort levels of each technique were compared. To avoid infection and speed recovery, patients were provided with antibiotic eye ointment for one week after the treatment. Two weeks later, a follow-up exam would evaluate therapy efficacy. During this follow-up, the broadest point of the chalazion was remeasured. A 2 mm reduction was deemed a successful treatment. A unique proforma was used to record each patient's chalazion readings and treatment response for subsequent examination.

DATA ANALYSIS PROCEDURE:

Data was handled and analysed using SPSS 20 for Windows. Mean and standard deviation were used to summarise continuous data such as patient age, chalazion length, and pre-and post-injection lesion size. We also estimated the median and interquartile range (IQR) to better understand data distribution. Data was tested for normality using the Shapiro-Wilk test. If the data were abnormal, the median and IQR were used instead of the mean and standard deviation. This statistical method accurately represented and compared treatment outcomes while maintaining validity and reliability. The frequency and percentage were calculated for gender and treatment effectiveness in both groups. To compare the outcomes, the Chi-square test or Fisher's exact test was applied, with a P-value of ≤ 0.05 considered statistically significant. Factors such as age, gender, chalazion duration, and pre-injection chalazion size were identified as influential variables. Following this, the Chi-square/Fisher's exact

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ISSN: (e) 3007-1607 (p) 3007-1593

test was performed, with a P-value ≤ 0.05 used to assess the significance of each factor's impact on treatment outcomes.

RESULTS

Participants in this study ranged in age from 12 to 50, with an average age of 34.45 ± 7.82 years. In Group A, the mean age was 33.71 ± 8.23 years, while Group B had a slightly higher mean age of 35.16 ± 7.71 years. Table I shows that 80 (68.97%) patients were 41–75 years old. As shown in Table II, 72 out of 116 patients (62.07%) were male, while 44 (37.93%) were female, resulting in a male-to-female ratio of 1.6:1. According to Table III, the average chalazion duration was 5.10 ± 0.91 weeks in Group A and 5.45 ± 0.92 weeks in Group B. The average chalazion size was 5.89 ± 1.94 mm, as indicated in Table IV. Extralesional triamcinolone injections in 51 Group A patients (87.93%) were effective. In Group B, 18 patients (68.97%) treated with subcutaneous intralesional triamcinolone injections showed effectiveness with a p-value of 0.013 (Table V). Tables VI and VII stratify efficacy by age and gender. Table VIII shows efficacy analysis by chalazion duration and size, enabling a full evaluation of therapy success across patient features.

Table I: Age distribution

Age(years)	Group A (n=58)		Group B (n=58)		Total (n=116)	
	No.of patients	Percentage	No.of patients	Percentage	No.of patients	Percentage
12-30	21	36.21	15	25.86	36	31.03
31-50	37	63.79	43	74.14	80	68.97
Mean±SD	33.71±8.23		35.16±7.71		34.45±7.82	

TableII: Distribution of patients according to gender.

Gender	Group A (n=58)		Group B (n=58)		Total (n=116)	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Male	36	62.07	36	62.07	72	62.07
Female	22	37.93	22	37.93	44	37.93

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ISSN: (e) 3007-1607 (p) 3007-1593

Table III: Patient Distribution Based on Chalazion Duration.

Duration(weeks)	Group A (n=58)		Group B (n=58)		Total (n=116)	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
≤6	54	93.10	51	87.93	105	90.52
>6	04	6.90	07	12.07	11	9.48
Mean±SD	5.10±0.91		5.45±0.92		5.31±0.91	

Table IV: Patient Distribution Based on Chalazion Size .

Size(mm)	Group A(n=58)		Group B(n=58)		Total (n=116)	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
≤6	35	60.34	38	65.52	73	62.93
>6	23	39.66	20	34.48	43	37.07
Mean±SD	6.14±2.13		5.72±1.90		5.89±1.94	

Table V:Comparison of the efficacy subcutaneous intralesional and extralesional injection triamcinolone in the treatment of chalazion (n=116).

		Group A(n=58)		Group B(n=58)	
		No.of Patients	Percentage	No.of Patients	Percentage
EFFICACY	Yes	51	87.93	40	68.97
	No	07	12.07	18	31.03

- P value is 0.013 which is statistically significant.

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ISSN: (e) 3007-1607 (p) 3007-1593

Table VI: Efficacy Stratification Based on Age Groups.

Age of patients (years)	Group A(n=58)		Group B(n=58)		p- value
	Efficacy		Efficacy		
	Yes	No	Yes	No	
12-30	19(90.48%)	02(9.52%)	12(80.0%)	03(20.0%)	0.370
31-50	32(86.49%)	05(13.51%)	28(65.12%)	15(34.88%)	0.028

Table VII: Stratification of Efficacy Based on Gender.

Gender	Group A(n=58)		Group B(n=58)		p- value
	Efficacy		Efficacy		
	Yes	No	Yes	No	
Male	31(86.11%)	05(13.89%)	26(72.22%)	10(27.78%)	0.147
Female	20(90.91%)	02(9.09%)	14(63.64%)	08(36.36%)	0.031

Table VIII: "Stratification of efficacy with respect to duration."

Duration (weeks)	Group A(n=58)		Group B(n=58)		p- value
	Efficacy		Efficacy		
	Yes	No	Yes	No	
≤6	48(88.89%)	06(11.11%)	35(68.63%)	16(31.37%)	0.011
>6	03(75.0%)	01(25.0%)	05(71.43%)	02(28.57%)	0.898

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ISSN: (e) 3007-1607 (p) 3007-1593

Table IX: efficacy Stratification According to size.

Size(mm)	Group A(n=58)		Group B(n=58)		p- value
	Efficacy		Efficacy		
	Yes	No	Yes	No	
≤6	33(94.29%)	02(5.71%)	31(81.58%)	07(18.42%)	0.099
>6	18(78.26%)	05(21.74%)	09(45.0%)	11(55.0%)	0.024

DISCUSSION

Chronic meibomian gland inflammation causes chalazion, a solid, painless eyelid nodule. Histologically, it has zonal lipo granulomatous inflammation around lipid-filled gaps that disintegrate during tissue processing. The components of the lesion include polymorphonuclear leukocytes, plasma cells, lymphocytes as well as the multinucleated giant cells.

Maintaining regular eyelid cleanliness, applying warm compresses, and utilizing topical antibiotics can achieve an 80% success rate. More successful are intralesional corticosteroid injections, which can reach 93%. Intralesional steroid injections hurt. However, given that triamcinolone acetonide suspension was deposited into the looser intralesional zone, the painful nature associated with intralesional injections was not experienced. Leinfelder et al. used subconjunctival methylprednisolone acetate injections to manage the acute chalazion, and Ho Sy et al. had a complete remission rate of 89.6 % in subcutaneous triamcinolone injection. This study compared subcutaneous intralesional and extralesional triamcinolone injections for chalazion. The participants' ages varied between 12 and 50 years, with an average age of 34.45 ± 7.82 years. In Group A, the mean age was 33.71 ± 8.23 years, whereas Group B had an average age of 35.16 ± 7.71 years. The majority of participants (80 individuals, 68.97%) fell within the 41–75 age range. The 116 patients had a male-to-female ratio 1.6:1, with 72 (62.07%) male and 44 (37.93%) female.

Treatment outcomes were effective in 51 (87.93%) Group A patients who received extralesional triamcinolone injections and 18 (68.97%) Group B patients who received subcutaneous intralesional injections. The efficacy difference was substantial (p=0.013). A separate study found that these treatments had an efficacy rate of 84.8% for extralesional and 82.6% for intralesional resolution, demonstrating their efficacy.[9]

Many researchers have proven that corticosteroids are beneficial for chalazion. Intralesional steroid injections have varied effectiveness rates, supporting their clinical use. Kaimbo and Nkidiaca et al. found 72% success in 25 intralesional steroid-treated chalazion patients. However, the overall remission rate estimated in the present work is somewhat lower compared to the success rate that was detected by the authors. BenSimon et al. found 81% success with intralesional steroids, which matches our 82% efficacy. Ahmed et al. found 80% success with intralesional steroid injections in another research. Subsequently, Pavić-Astalos et al. further confirmed the efficacy of this treatment, and Biuk D et al. also supported that the expression of this treatment was valuable for both first-time chalazion and recurrent chalazion patients. An effective alternative to intralesional steroid therapy is extralesional subcutaneous triamcinolone. According to research, this method is safe, effective, and less painful. SY Ho et al. found subcutaneous steroid injections effective, with an 89.6% success rate. Extralesional steroid

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ISSN: (e) 3007-1607 (p) 3007-1593

therapy was also validated by Chung CF et al., who reported a success rate of 93.8%, greater than our study's 87.93%. These data show that extralesional steroid injections may be more comfortable and effective than intralesional ones.

After the success of intralesional triamcinolone therapy, more research is needed to adjust the dosage and study long-term recurrence. Comparative trials with different patient demographics and treatment settings would determine the safest and most effective concentration and injection approach. As evidence accumulates, extralesional injections may replace surgical excision as the primary chalazion treatment. They are minimally invasive, cost-effective, and patient-friendly.

CONCLUSION

This study concluded that subcutaneous extralesional injection triamcinolone is better as compared to subcutaneous intralesional in the treatment of chalazion. So, we recommend that subcutaneous extralesional injection triamcinolone should be used as a primary method for chalazion treatment in order to reduce the morbidity of our population.

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