

# The Usefulness of Diathermy Thermocoagulation in Chalazion Surgery

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**Purpose:** To investigate the usefulness of diathermy thermocoagulation in chalazion surgery.

**Methods:** This prospective, observational study included 30 sides from 24 patients who underwent chalazion surgery using diathermy thermocoagulation. The eyelid was fixed with a chalazion clamp under local anesthesia. The skin or palpebral conjunctiva was incised, and the chalazion was partially curetted. The residual chalazion contents were coagulated with diathermy and detached from the surrounding tissues using forceps and scissors. Then, the residual chalazion contents were completely removed.

**Results:** The chalazion was not palpable in all cases 1 week postoperatively. A small chalazion redeveloped close to the primary lesion 2 weeks postoperatively in one patient; however, it spontaneously improved. No other cases experienced recurrence or complication during the follow-up periods.

**Conclusion:** Thermocoagulation of chalazion contents using diathermy facilitates grasp, dissection, and excision of chalazion contents.

**Keywords:** chalazion, surgery, thermocoagulation, diathermy



## Introduction

A chalazion is a chronic lipogranulomatous inflammation caused by meibomian gland occlusion.<sup>1,2</sup> An acute chalazion is initially managed conservatively using a warm compress and antibiotic/steroid eye drops or ointment. Intralesional triamcinolone acetonide (TA) injection or incision and curettage (I&C) is considered for a persistent chalazion.<sup>3-8</sup> The advantages of I&C in comparison to TA injection include earlier resolution and less recurrence, although TA injection is a quick and effective therapy.<sup>3-7</sup> A large chalazion has better responses to I&C.<sup>8</sup> However, incomplete chalazion drainage results in partial chalazion resolution or recurrence,<sup>9</sup> and excisions of the entire chalazion contents are a requisite.

The chalazion contents are atheromatous and sticky; thus, they are difficult to grasp with forceps and detached from the surrounding tissues. Therefore, we devised a chalazion surgery with diathermy thermocoagulation of the chalazion contents for easy grasp and detachment to address this knowledge gap. The present study aimed to present our devised surgical method.

## Materials and Methods

This prospective, observational study was conducted following the Declaration of Helsinki and its amendment. This study was approved by the ethical review board of Mawatari Oculoplastic Clinic. Written informed consent was obtained from each patient, following the ethical board regulations. Additionally, written informed consent for publication of identifiable face photos was obtained from the patients shown in the figures.

Our study included consecutive patients who underwent chalazion surgery using diathermy thermocoagulation at Mawatari Oculoplastic Clinic from January 2021 to April 2022. Patient clinical and demographic data, including age,

sex, and affected side, were collected. A chalazion that is confined to the tarsus was approached via a palpebral conjunctiva incision, whereas a large chalazion that extends to the subcutaneous layer or ruptures the skin was approached via a skin incision. We partially harvested a chalazion tissue before diathermy thermocoagulation in patients who underwent transcutaneous surgery. The specimen was pathologically examined to rule out sebaceous gland carcinoma. We did not harvest a chalazion tissue in patients who underwent transconjunctival surgery because the volume of chalazion contents was too small to be harvested for pathological examinations. Patients were followed-up at 1 week, 1 month, and 3 months postoperatively. Additional follow-ups were done as required.

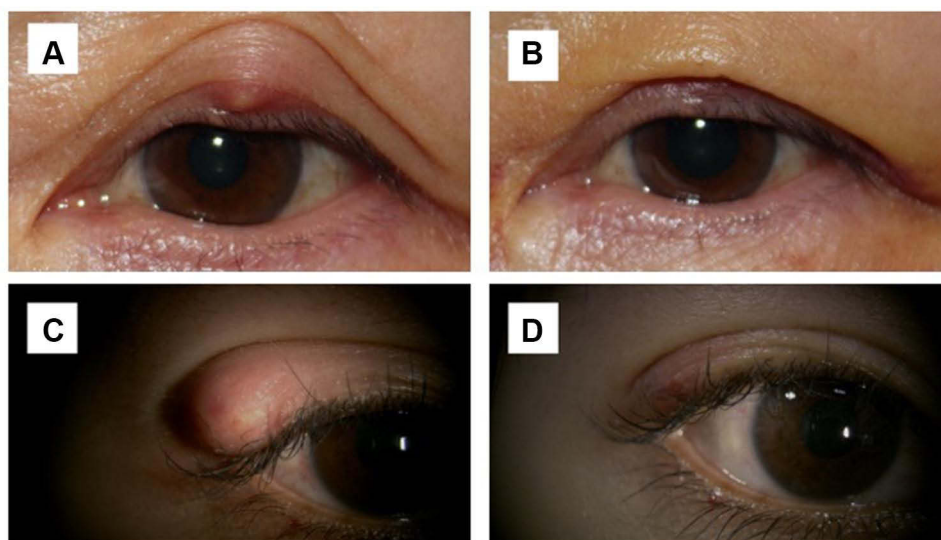
## Surgical Procedures

All surgeries were done by one of the authors (YM). The eyelid was fixed with a chalazion clamp after subcutaneous and conjunctival forniceal injections of local anesthesia using 2% lidocaine with 1:80,000 epinephrine. The palpebral conjunctiva was vertically incised with a No. 11 blade for the transconjunctival approach. In contrast, the skin was incised along the relaxed skin tension lines with a No. 11 blade for the transcutaneous method. Residual contents were coagulated using a diathermy (Surgitoron<sup>®</sup> Dual/EMC 90, Ellman-Japan, Osaka, Japan) after partial curettage of chalazion contents. Residual contents were detached from the surrounding tissues using forceps and scissors, followed by their removal. The skin was closed with 6-0 Nylon<sup>®</sup> (Mani Co. Ltd. Inc., Tochigi, Japan) in patients in whom the skin was incised.

## Results

Our study includes 30 sides (16 right upper eyelids; 4 right lower eyelids; 8 left upper eyelids; 2 left lower eyelids) from 24 patients (10 males and 14 females; mean age, 39.0 years; age range, 22–65 years). Transconjunctival and transcutaneous approaches were performed on 11 and 19 sides, respectively. The average duration from the onset of symptoms to surgery was 3.1 months (range, 0.5–12 months).

The chalazion was not palpable in all cases 1 week postoperatively (Figure 1). A small chalazion developed close to the primary lesion 2 weeks postoperatively in one patient, which was resolved spontaneously. Afterward, no recurrence occurred within 3 months postoperatively. Any complications, including wound infection, wound dehiscence, madarosis, excess bleeding, decreased vision, and ocular surface damage, were not observed in the patients. Pathological examinations of all specimens confirmed the diagnosis of chalazion showing lipogranuloma with inflammatory cells. None of the patients were pathologically diagnosed with sebaceous gland carcinoma.



**Figure 1** Eyelid photographs before and 1 week after chalazion surgery.

**Notes:** (a and c) before surgery (b and d) one week postoperatively. The chalazion masses resolved one week postoperatively.

We show 2 representative patients with chalazion who underwent diathermy thermocoagulation. A chalazion in Case 1 was largest among the present cases.

## Report of Cases

### Case 1

A 52-year-old male patient noticed a mass in the left lower eyelid 1 month before presenting for surgery. The mass did not improve with antibiotics, eye drops, and ointment. He was referred for surgical treatment. Half of the chalazion contents were removed using scissors after a skin incision. The residual chalazion contents were coagulated using diathermy and removed by scissors. The skin was closed with 6-0 Nylon<sup>®</sup> (see [Video 1](#)). The chalazion mass disappeared 1 week postoperatively. The patient had no evidence of recurrence or any complications 6 months postoperatively.

### Case 2

A 27-year-old female patient presented with a chalazion in the left upper eyelid. The chalazion contents were coagulated with diathermy, detached from the tarsus, and completely removed after a palpebral conjunctival incision (see [Video 2](#)).

## Discussion

This study showed our devised surgical technique of thermocoagulation of chalazion contents using diathermy. Incomplete removal of chalazion contents causes recurrence, although surgical excision of a chalazion is helpful for early improvement.<sup>9</sup> Our surgical technique using thermocoagulation of chalazion contents facilitates grasping chalazion contents with forceps and detaching them from the tarsus and surrounding tissues. This enables secure and complete chalazion content excision. Resolution of a chalazion in all the cases even 1 week postoperatively without recurrence or complications during the follow-up period showed the usefulness of our technique.

Our technique has other significant benefits. Easy grasp and dissection of chalazion contents may be advantageous, especially for inexperienced surgeons and pediatric patients with difficulty enduring surgery for a long time under local anesthesia. Additionally, simultaneous hemostasis using diathermy lowers the risk of bleeding and leads to early eyelid edema resolution.

This study did not compare the results of chalazion surgery with or without diathermy. In a previous study, a cautery was applied to the edges of the conjunctiva, tarsus, and inside wall of a chalazion after curettage of the lesion; however, the success rates were not different between surgery with (78%) and without cautery use (74%).<sup>10</sup> In this study, a cautery was used only to reduce bleeding time. Additionally, it was unclear whether the chalazion was completely removed or not.<sup>10</sup> The use of a cautery may not improve the surgical success rate. Moreover, our success rate was higher than the previous study.

Previous studies showed that surgical success rates of single TA injection and I&C ranged from 8.7–86.7% and 60%–92%, respectively.<sup>3–8,11,12</sup> A previous study demonstrated the resolution of multiple chalazia in all 25 patients after combined I&C and following TA injection.<sup>12</sup> Our technique may provide better surgical outcomes compared to sole TA injection or I&C and comparable outcomes to a combination of I&C and TA injection.

There were several limitations to this study. As mentioned above, this study did not include comparative results with or without diathermy. Additionally, a follow-up period was short.

In conclusion, thermocoagulation of chalazion contents facilitates grasping with forceps and detaching from the surrounding tissues, which enables secure and complete chalazion excision.

## Data Sharing Statement

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

## Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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## Disclosure

The authors declare that they have no competing interests in this work.

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