

Research Article

Personal Technique for Rapid Removal of Chalazion Using Laser Microsurgery

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Abstract

Purpose: the aim of this research is to evaluate the usefulness of a photocoagulator laser beam as a hot blade to remove the chalazion on an outpatient basis while the patient is seated with his head positioned in front of a slit-lamp microscope.

Materials and methods: this prospective, observational study involved 3675 chalazia in 2840 patients, including 1643 males and 1197 females, with a mean age of 36.4 years (range 11-90 years). 462 patients had more than one chalazion. The patient's head is positioned in front of the slit-lamp biomicroscope, his eyelid is fixed with a chalazion clamp and then a small vertical incision of the palpebral conjunctiva (internal chalazion) and tarsus (external chalazion) is performed with a Neodymium-doped Yttrium Aluminium Garnet Laser (532 nm laser photocoagulator). The surgical approach is always transconjunctival. The chalazion contents are curetted and removed. Patients were followed up at 15 and 30 days.

Results: fifteen days after surgery, 3630 chalazia (98.8%) were completely removed with excellent functional and aesthetic results. In 45 cases (1.2%), redness and swelling of the eyelid persisted due to the presence of granuloma residues. After fifteen days of local treatment with antibiotic-steroid ointment, 20 cases (0.53%) healed, while in the other 25 cases (0.67%) the granuloma residues were removed using the same surgical technique. After thirty days, the chalazion was not palpable in all cases.

Conclusion: this procedure proved to be simple, quick, effective, safe and well tolerated by patients. Furthermore, the use of the photocoagulator laser beam reduced the risk of bleeding, making the operating field dry and clearly visible thanks to the use of the biomicroscope, promoting rapid resolution of the eyelid oedema. The technique is contraindicated in uncooperative patients who require anaesthetic assistance.

Keywords: Chalazion; Laser Microsurgery of Chalazion; Laser Photocoagulation; Meibomian Gland; Eyelid

Introduction

Tears are composed of water, mucus and an oily fluid produced by the Meibomian glands located within the eyelid tarsus. Chalazion is a lipogranulomatous inflammation caused by obstruction of the Meibomian gland ducts, which often becomes chronic [1]. Individuals of all ages, including children, can be susceptible to this disease [1]. Patients suffering from blepharitis, tear film dysfunction, rosacea or seborrheic dermatitis have a higher incidence of chalazion and a higher frequency of recurrence [1-3]. These factors cause chronic inflammation and alter the morphological and functional characteristics of the Meibomian glands. Initially, chalazion can be resolved with local or, in some cases, systemic medical therapy within 15 days of its onset. However, sometimes the lesion becomes persistent, hard and prominent, thus requiring a surgical solution. Several treatment methods are available, including eyelid hygiene, the application of warm compresses, antibiotic and cortisone ophthalmic ointments, steroid injections, diathermy thermocoagulation, pulsed light and surgical excision of the lesion with curettage [4-10].

Current protocols recommend an initial conservative approach involving the local application of antibiotic-cortisone ointments combined with warm compresses on the eyelids. Personally, I do not agree with this strategy, as warm compresses increase eyelid inflammation, which cortisone ointment reduces. I have seen many patients who followed this protocol for several months without any benefit, but rather with chronic lesions and worsening clinical symptoms. I recommend warm compresses only in the management of blepharitis not complicated by styes or chalazions, with the aim of facilitating the expression of the Meibomian glands. Classic excision and curettage treatments are considered simple and effective but can cause persistent redness and discomfort to the eyelid [11]. A recurrent or persistent chalazion can cause aesthetic deformities to the eyelid, chronic conjunctivitis and, in some cases, impaired vision due to the appearance of corneal astigmatism resulting from mechanical ptosis. Finally, some patients may experience a decrease in their quality of life with the risk of developing anxiety and depression. The aim of this research is to evaluate the usefulness of a photocoagulator laser beam as a hot blade to remove the chalazion on an outpatient basis while the patient is seated with his head positioned in front of a slit-lamp microscope.

Materials and Methods

This prospective, observational study involved 2840 patients and 3675 chalazia (1730 upper chalazia and 1945 lower chalazia) between January 2010 and June 2025. The participants, including 1643 males and 1197 females, had a mean age of 36.4 years (range 11-90 years) with chalazia present for at least 2 months accompanied by pain and erythema, which did not respond to conservative therapies, including antibiotic and cortisone ophthalmic ointments. 462 patients had more than one chalazion. Before treatment, the patients' medical history was collected, including age, sex, duration of chalazion, number of chalazia, presence of blepharitis, rosacea, seborrheic dermatitis, allergies and previous removals with traditional surgery. The characteristics of the chalazion, including its location, size and degree of inflammation, were determined using slit-lamp microscopy. In cases of numerous granulomatous lesions with significant eyelid oedema and rosacea, patients were prescribed oral therapy with Doxycycline 100 mg for 10 days, which in many cases reduced the number of lesions. It was not necessary to suspend the anticoagulant or antiplatelet drugs that some patients were taking regularly. Exclusion factors were intraocular inflammation, severe allergies and, above all, uncooperative patients. General written consent was obtained in which patients (or their tutor in the case of minors) agreed to this surgical technique. It was evaluated by the Ethics Committee of the Igea Private Hospital (Milan, Italy) and deemed not to require ethical approval. In addition, written informed consent was obtained for the publication of the photos of the patients shown in the figures. After instilling a drop of 4 mg/ml Oxybuprocaine Hydrochloride and disinfecting the periocular skin with a 10% Povidone-Iodine solution, a local anaesthetic (2 ml of 2% Lidocaine) was injected. With the help of an assistant, the patient's head was then positioned in front of the slit-lamp biomicroscope with the eye protected by a drop of Hydroxypropylmethylcellulose (Gel 4000, Bruschettini s.r.l. Genova, Italy) and rotated away from the direction of the laser beam. All chalazia were removed using a transconjunctival approach [12,13]. The eyelid was fixed in the desired position with Lambert or Hunt chalazion forceps and the tarsal conjunctiva was dried with an eye spear. After setting the laser power (1 watt in continuous wave) and the spot diameter (100 μ m), a vertical incision was made in the palpebral conjunctiva (internal chalazion) and tarsus (external chalazion) 2-3 mm in length using a Neodymium-doped Yttrium Aluminium Garnet Laser (Alcon Ophthalas 532 EyeLite Laser Photocoagulator) (Fig. 1,2). The chalazion contents were completely curetted with a Meyhoefer spoon (diameter 1.2 or 3 mm, depending on the location and size of the chalazion) (Fig. 1,2). The eye was washed with cold Balanced Saline Solution (BSS), medicated with Tobramycin 3mg/g + Dexamethasone 1mg/g ophthalmic ointment and bandaged for one hour. Finally, treatment with Betamethasone 1 mg/g + Chloramphenicol 2.5 mg/g ophthalmic gel was prescribed 3 times a day for 10 days. In some patients, multiple chalazia were removed in a single session. Patients were followed up at 15 and 30 days.



Figure 1: The Neodymium-doped Yttrium Aluminum Garnet Laser and surgical instruments.

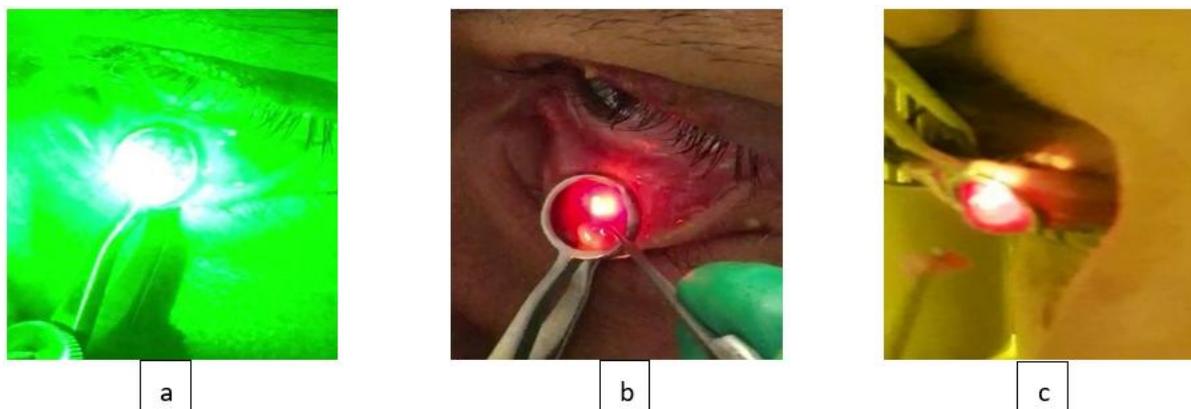


Figure 2: The patient's head is placed in front of the slit-lamp biomicroscope. After a laser incision (a), the chalazion contents are curetted and removed: lower eyelid (b), upper eyelid (c).

Results

Fifteen days after surgery, 3630 chalazia (98.8%) had been removed and the patients had healed. In 45 cases (1.2%), redness and swelling of the eyelid persisted due to the presence of granuloma residues. After fifteen days of local treatment with antibiotic-steroid ointment, 20 cases (0.53%) healed, while in the other 25 cases (0.67%) the residues were completely removed using the same surgical technique. This complication, due to the initial learning curve, was reduced as the technique was perfected. After thirty days, the chalazion was no longer palpable in all cases.

Discussion

In this article, I have described the first surgical technique that, to my knowledge, uses a 532 nm laser photocoagulator beam as a hot blade to incise the eyelid and remove the chalazion on an outpatient basis while the patient is seated with his head positioned in front of a slit-lamp microscope. The advantages of this technique include the use of smaller instruments than those used in traditional surgery, simplicity and speed of execution, small incision, excellent visualisation of the lesion with the aid of a biomicroscope and no sutures. In addition, the use of the photocoagulator laser beam reduces the risk of bleeding, keeping the surgical field dry and clean promoting rapid resolution of eyelid oedema with excellent functional and aesthetic results. It has also proved very useful for the treatment of multiple, small chalazia located near the lacrimal point or the eyelid margin, where traditional surgery could be imprecise or cause permanent functional and aesthetic defects. Being a granuloma, a chalazion does not have a capsule, but older lesions may be surrounded by thick fibrosis that must be removed with the aid of forceps and scissors. The differential diagnosis includes styes, canaliculitis, sebaceous and serous cysts which, unlike chalazia, are mobile and have a capsule that must be removed to prevent recurrence.

Conclusion

The technique proved to be simple, fast, safe, effective and well tolerated even by children. We achieved a reduction in the duration of surgery (a few minutes), healing time, costs and patient discomfort. Since the procedure is performed on an outpatient basis with the patient seated, attention must be paid to the possible onset of lipothymia in emotional subjects. In fact, it is not recommended for uncooperative patients who would require anaesthetic assistance. Finally, all patients reported being very satisfied and those who had previously undergone traditional surgical techniques stated that they preferred this method.

Conflict of Interest

The author declares no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

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