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Traumatic cataract induced by improper use of a percussion massage gun

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ABSTRACT

Purpose: We describe a case of traumatic cataract after improper use of a percussion massage gun over the periorbital area.

Observations: A 38-year-old female with a history of high myopia and fibromyalgia presented to the emergency department with painless monocular vision loss OS, noticed two days prior and described as a "white film" over her eye. BCVA was 20/20 OD and 20/600 OS. IOP was normal. Slit lamp examination OS showed a dense posterior subcapsular cataract in a rosette pattern without signs of zonular instability. B-scan ultrasonography showed a clear vitreous cavity without structural globe anomalies. No other abnormalities were apparent. After ruling out other causes, vision loss was attributed to development of a traumatic cataract secondary to percussive massage gun use over the left temple and periorbital area, including directly over the eye, during the past few weeks as an attempt to relieve intractable headaches.

Conclusion and importance: Improper use of massage guns can lead to severe ocular side effects including traumatic cataracts that may be difficult to manage. There is a need to educate patients about potential harms as well as require manufacturers to clearly display safety information.

1. Introduction

Initially developed for use by trained professionals, percussion massage guns are portable devices that deliver quick, deep, forceful, and repeated strokes to the body to help improve physical performance, reduce soft tissue pain, stretch muscles, and improve circulation.[1] In the past few years, massage guns have become increasingly affordable and more compact, leading to their growing popularity amongst general consumers. A variety of models are available to the everyday user with many cheaper ones available for less than $100.[2,3] The current global massage gun market is estimated to be approximately USD 540 million with robust growth projections.[4] Concurrently, utilization of massage guns on and around the eyes have led to a number of adverse ocular events, including lens subluxation, acute angle closure glaucoma, retinal detachment, and iris neovascularization.[5–9] Here, we report a case of traumatic cataract caused by improper use of a percussion massage gun around the periorbital area, highlighting the severe danger this product imposes on ocular health.

2. Case report

A 38-year-old female with a history of high myopia and fibromyalgia presented to the emergency department with painless monocular vision loss of the left eye that had progressively worsened over the previous two days. At presentation, she was able to distinguish shapes and see 20/600 with the left eye. Pupillary exam and intraocular pressures were within normal limits. Slit lamp examination of the left eye showed a dense rosette cataract without any other signs of zonular instability (Figs. 1 and 2). View of posterior segment was limited; B-scan ultrasonography was negative. The opposite eye was unremarkable with 20/20 vision.

Further history revealed that the patient had been using a percussion massage gun over her left temple and periorbital area, including directly on the eye, for relief of sinus headaches over the past few weeks. She was unable to provide information or further details about the massage gun or specifics regarding her usage of this device. At her 2-month examination, the traumatic cataract had progressed to a white cataract with light perception vision (Fig. 2, B), and the patient was scheduled for cataract surgery.

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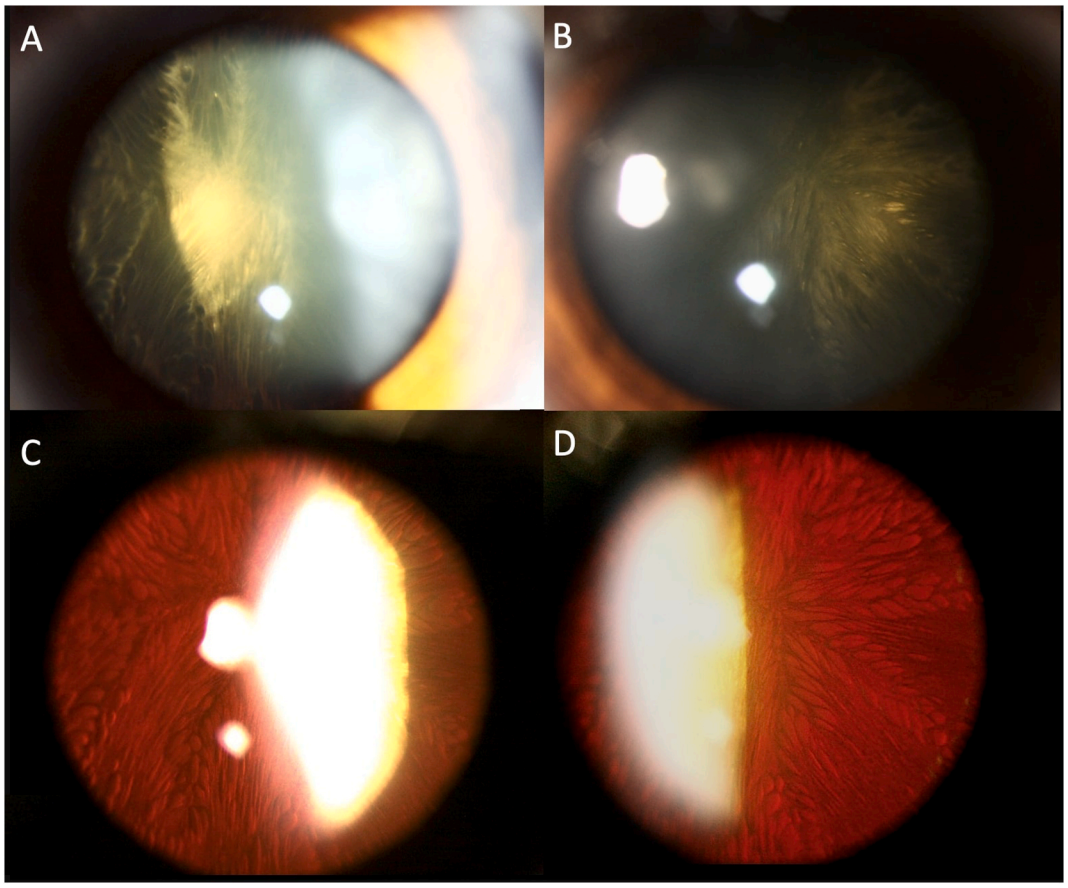

Fig. 1. Clinical Images of Massage Gun-induced Traumatic Cataract. A-D, A rosette cataract of the left eye seen on initial presentation using direct illumination (A and B) and retroillumination (C and D.) The petaloid and stellate configuration of the posterior subcapsular lenticular region is consistent with a traumatically induced cataract. D.

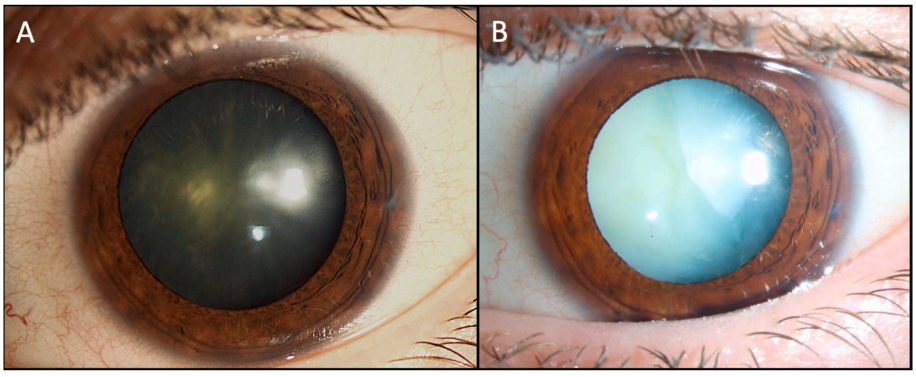

Fig. 2. Clinical Images of Progression of Massage Gun-Induced Traumatic Cataract. The cataract progressed from initial appearance (A) to near complete opacification at 2 month follow up (B.).

At the time of surgery due to the intumescent nature of the white cataract, a 27-gauge needle was used to decompress the bag prior to initiation of circular continuous capsulorhexis. Unfortunately, the capsulorhexis radialized and viscoelastic was used to maintain the integrity of the anterior chamber and the lens-capsule complex. The remaining lens material was aspirated using the irrigation/aspiration unit. Upon further inspection after removal of the lens, the posterior capsule was found to be intact and the capsular rents radialized only to the zonules. A single piece acrylic intraocular lens was placed into the bag with haptics rotated away from the region with the capsular rents. The patient had an uneventful postoperative recovery with a best corrected visual acuity of 20/15–2 in that eye. The manifest refraction postoperatively was −14.75 in phakic eye and −1.00 for the pseudophakic eye. Examination did not show any instability of the intraocular lens within the capsular bag. Given her functional needs, she was referred for fitting of a rigid gas-permeable contact lens of the right eye. She has remained happy with the outcome six months after cataract surgery.

3. Discussion

Including our traumatic cataract case, there are now multiple, recent reports of severe ophthalmic adverse effects from use of a percussion

massage gun over and around the globe. Mechanistically, development of a traumatic cataract from use of a percussive massage gun has been hypothesized to involve repetitive coup and countercoup injuries from shockwaves created by the massaging device placed against the globe.[6] Notably, in enucleated animal eyes, a blunt projectile object causes lens dislocation when the kinetic energy reaches approximately 0.75Nm (0.55 ft-lb) and retinal injury at 1.20Nm (0.89 ft-lb).[6] Commercially available budget massage guns have an amplitude of 8–10mm and deliver 20 to 30 pounds of force, producing between 0.53 and 0.98 ft-lb per strike, which is well within the threshold to induce both lens dislocation and retinal detachments. Higher end massage guns that produce higher amplitudes and can deliver up to 60 pounds of force per strike convey even a greater risk. Our case and the several other reported cases reveal a serious safety risk of percussion massage guns when used on or around the eye. With this report we hope to increase awareness of the dangers that massage guns pose to ocular health. A possible first step towards better patient safety would be to indicate on the device a warning "not for use on and around the eye."

4. Conclusions

With rapidly decreasing prices and easy availability of massage guns, we foresee a rise in serious ocular adverse effects from improper use. Public awareness of the potential harms of massage guns is paramount with a need for manufacturers to clearly display safety information and warning labels on the packaging for consumers, indicating that the device is "not for use on or around the eyes". Healthcare practitioners must be aware of potential complications in order to advise patients about the harms of improper massage gun use.

Patient consent

The patient consented to publication of the case in writing.

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Authorship

All authors attest that they meet the current ICMJE criteria for Authorship.

CRediT authorship contribution statement

Arnulfo Garza Reyes: Conceptualization, Data curation, Investigation, Project administration, Resources, Writing – original draft, Writing – review & editing. **Noor-Us-Sabah Ahmad:** Writing – original draft, Writing – review & editing. **Matthew G. Field:** Conceptualization, Writing – original draft. **Sarah Skiles:** Data curation, Resources. **Thomas A. Oetting:** Conceptualization, Supervision, Writing – review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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