



Possible role of frankincense in the treatment of benign essential blepharospasm

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ABSTRACT

Purpose: To report two cases of benign essential blepharospasm (BEB) symptom relief in the setting of regular topical frankincense usage.

Observations: The primary outcome measures for this report are (1) frequency of botulinum toxin (BT) injection appointments before and after the onset of regular frankincense usage and (2) patient report of symptoms. After starting frankincense, patient 1 decreased the frequency of her BT injection appointments from 5 to 8 months to 11+ months, eventually stopping BT injections altogether. Patient 2 decreased her BT appointments from every 3–4 months to approximately every 8 months after starting frankincense. Both patients had previously tried multiple additional treatments for their BEB symptoms which did not yield improvement; both patients reported significant improvement in their symptoms secondary to topical frankincense oil.

Conclusion and Importance: Frankincense is a natural product of *Boswellia* trees. It has been used primarily for its anti-inflammatory properties for many years in multiple countries. We report two cases of individuals with long-standing, debilitating benign essential blepharospasm achieving significant symptom relief after beginning regular usage of topical frankincense essential oil. This natural oil offers an organic and effective treatment option for this chronic, progressive condition.

1. Introduction

Benign essential blepharospasm (BEB) is a focal dystonia characterized by involuntary contraction of the orbicularis oculi. Oral medications for BEB include benzodiazepines, anticholinergics, antimuscarinics, and dopaminergics, but these therapies generally lack long-term effectiveness and result in significant side effects. Surgical myectomy is generally recommended for those who do not respond to or tolerate medical therapy¹ To date, the most effective therapy for BEB is botulinum toxin (BT) injections, but a recent Cochrane review indicates that the effect begins to wear off after 10.1 weeks.² Most patients receive injections approximately every 12 weeks or 4–5 times per year.¹ A non-invasive therapy for BEB or increasing the time between injections could improve quality of life among patients with BEB.

Frankincense is a natural gum resin derived from *Boswellia* trees and has been used in rheumatoid arthritis, ulcerative colitis, Crohn's disease, multiple sclerosis, and other inflammatory conditions. It has also been used among patients with Parkinson disease, a condition characterized by dystonic movements.³ We report the novel use of topical frankincense

for the treatment of BEB.

2. Case report

A 73-year-old woman noted a three-year history of progressive light sensitivity, dry eyes, and eyelid spasms. Her visual acuity was 20/20 each eye. The rest of her afferent and efferent examination was unremarkable. She was diagnosed with BEB and treated with 50 units of BT injections and artificial tears. She received a total of 50 units of onabotulinumtoxinA along the upper and lower medial and lateral eyelids as well as the lateral canthal region. The patient received repeat injections 2 and 5 months later then was lost to follow-up for 4 years.

She resumed BT injections in May 2007 due to worsening of symptoms and consistently scheduled injections every 5–8 months. In 2009, she began using topical frankincense essential oil on all four eyelids daily. After approximately one year, she experienced improvement in symptoms and decreased her BT injection frequency to every 11 months before stopping altogether in September 2010. She did not receive BT again before her death in September 2018.

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3. Case report 2

A 66-year-old woman reported a ten-year progressive history of difficulty keeping her eyes open. She endorsed increased blinking, involuntary eyelid closure, and photophobia. Her visual acuity was 20/20 in each eye. The rest of her afferent and efferent examination was unremarkable. She received a diagnosis of BEB and was given FL-41 tinted lenses. She began BT injections in March 2014. She received incobotulinumtoxinA injections around the lateral canthus, lateral lower and upper eyelid, and medial lower eyelid bilaterally. She began with a total of 35 units from 2014 to 2020, then weaned to 30 units thereafter. She consistently received BT injections every 3–4 months until 2019.

In 2019, the patient began using topical frankincense oil daily to all four eyelids. After approximately one year of regular frankincense usage, her BT frequency decreased to an average of 8 months between injections. Her last injection was in March 2022.

4. Discussion

We report two cases of BEB symptom alleviation in the setting of regular topical frankincense usage. The patients discussed in this case study used “therapeutic-grade” frankincense. They both noted burning of the area after application of the oil; to combat this effect, they diluted the frankincense oil 1:1 with cottonseed oil, almond oil or coconut oil. After starting frankincense, one patient stopped BT injections altogether and the other increased the interval between BT injections from 3.5 months to 8 months.

The exact effect of boswellic acids in frankincense is unknown. They appear to have well-established neuroprotective properties attributable to their anti-inflammatory and antioxidant effects.⁴ Mice experiments suggest boswellic acids may reduce brain damage secondary to stroke, enhance learning and memory in Alzheimer’s disease, and improve motor symptoms in Parkinson’s disease.³ The proposed mechanisms involve reducing DNA oxidative damage and free radical formation, increasing acetylcholine levels in the brain, and decreasing acetylcholinesterase and tau levels in the brain respectively.³ Last, frankincense has beneficial effects multiple sclerosis via decreasing IL-17 production, neuropathic pain via TRPV1 downregulation, and anxiety through reduction of corticosterone levels.^{5,6}

The mechanism of action of frankincense in BEB is unclear. The effect may relate to the improvement in dystonic movements in Parkinson disease treated with frankincense.³ In a randomized, double-masked, placebo-controlled crossover study, anticholinergic and antimuscarinic therapies showed significant benefit to some of the subjects with BEB.⁷ In mouse models, frankincense has been shown to exhibit antimuscarinic properties, and this may explain the improvement among our patients.⁸ Alternatively, both patients could have experienced a placebo-like effect or enjoyed spontaneous improvement.⁶ However, Castelbuono and Miller noted that spontaneous improvement typically occurs within the first 5 years of symptom onset, whereas our patients had symptoms for 9 and 20 years respectively before improvement of their BEB symptoms.⁶

BT is well-established as the treatment of choice for BEB.¹ The recommended starting dose for BT injections in this specific context is 1.25–5 units/injection site, which can subsequently be increased in future appointments depending on response.⁹ It remains common practice to limit the dosing to ≤ 100 units.¹⁰ The patients in this case series received 2.5–5 units per injection site. They never exceeded more

than 5 units per injection site or 50 units for their total dosing. Most patients receive injections every 12 weeks, and it should be noted that Case 1 was atypical in that she received injections every 5–8 months.

Frankincense is non-toxic and has displayed an impressive safety profile. Multiple clinical trials yielded no long-term, irreversible adverse effects. The most prevalent side effects that have been noted are nausea and gastrointestinal upset. No severe drug interactions have been noted.¹¹

It is important to acknowledge this case series does not establish clear causation between regular periorbital frankincense usage and BEB symptom relief, warranting further study. A prospective trial of frankincense in the treatment of BEB would be helpful.

5. Conclusion

Frankincense is a natural product of *Boswellia* trees and has been used for its anti-inflammatory properties in multiple disease states. These cases suggest daily topical frankincense essential oil may improve signs and symptoms of benign essential blepharospasm, and further study is warranted.

Patient consent

Informed consent for research was obtained from both patients.

Acknowledgements and disclosures

The authors report no disclosures.

Authorship

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

Declaration of competing interest

The authors declare no conflict of interest.

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