



## Minimal orbicularis oculi myectomy for treatment of severe benign essential blepharospasm: A case report

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### Abstract

Benign essential blepharospasm (BEB) is a type of focal dystonia characterized by excessive, involuntary, repetitive contractions of the orbicularis oculi muscle. In severe cases, the spasms can lead to functional blindness. The most effective and commonly employed treatment option for BEB is the use of botulinum neurotoxin A. However it is expensive and only provides temporary relief of symptoms. We report the case of a 60-year-old woman who presented to our center with complaint of inability to open her eyes of 6 weeks duration. This was preceded by 7 months history of excessive blinking and increasing difficulty opening her eyes voluntarily. On examination, the eyelids were tightly closed and the protractor muscles (orbicularis oculi, procerus and corrugator muscles) were spastic. She was diagnosed of severe bilateral benign essential blepharospasm. She had bilateral minimal orbicularis oculi muscle myectomy (involving excision of 8 mm wide strip of the muscle which included the orbital, septal and distal part of the pretarsal orbicularis muscle) of the upper and lower eyelids leading to resolution of the muscle spasm and opening of the eyelids. At 14 months follow up, she remained free of symptoms. Minimal orbicularis oculi myectomy was effective in providing long term relief of blepharospasm in our patient. This may be a viable option for treatment of BEB in low-income countries like Nigeria.

### Introduction

Benign essential blepharospasm (BEB) is a type of dystonia that causes excessive involuntary spasms of the orbicularis oculi muscle.<sup>1</sup> It is a rare disease with reported incidence of 1.2 persons per 100,000 annually and prevalence of 16 to 133 per million.<sup>2</sup> It is more common in women, and the peak age of onset is in the sixth and seventh decades of life.<sup>3</sup> The spasms in BEB can have a significant impact on the daily activities of patients by causing visual disturbance or functional blindness, anxiety and depression.<sup>4</sup> The most effective and commonly employed treatment option for BEB is the use of Botulinum neurotoxin A (Botox).<sup>4</sup> Botulinum toxin, which is expensive and only provides temporary relief of symptoms was unaffordable to our patient. The successful management of a case of severe BEB by minimal orbicularis oculi myectomy (MOOM) with lasting symptom relief is hereby reported.

### Case presentation

A 60-year-old woman presented to our center with complaint of inability to open her eyes for 6 weeks due to spasm of her eyelids. This was preceded by a 7 month history of excessive blinking and increasing difficulty keeping her eyes open voluntarily and unusual sensitivity to light. The spasms were worse during the day and

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forced her to keep her eyelids closed for almost the entire day, with minimal relief at night. There was no associated twitching or spasm of any other part of her body. She was a known diabetic and hypertensive and on oral medication for their control.

On examination, the eyelids were tightly closed and the protractor muscles (orbicularis oculi, procerus and corrugator muscles) were spastic (Figure 1A).

Attempts at manual opening of the eyelids were unsuccessful due to spasm of the eyelids. She was unable to keep her eyes open for visual acuity assessment, slit lamp examination and fundoscopy. Systemic evaluation and assessment by a neurologist revealed no other abnormality, and a diagnosis of severe bilateral benign essential blepharospasm was made.



Figure 1. Photograph of patient (A) At presentation showing spastic closure of her eyelids (B) At 3 weeks follow up with eyelids voluntarily opened.

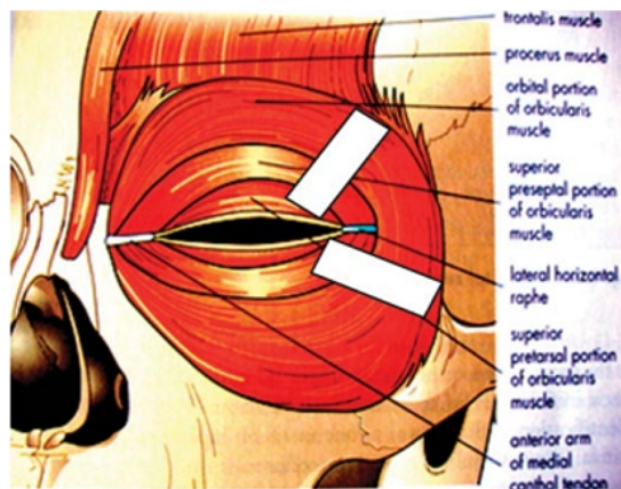


Figure 2. Diagram showing the principle of minimal orbicularis oculi myectomy<sup>5</sup>. The white rectangular block represent the part of the orbicularis muscle that was excised.

Botox injection was recommended to her. However, she was unable to afford the cost. Besides, it was not readily available in our locality. We decided to try bilateral minimal orbicularis oculi myectomy (MOOM) surgery on her under local anesthesia.

### Operative Technique

At surgery, after routine cleaning and draping, the

eyelids were infiltrated with local anesthesia (2% lignocaine with 1:1000 adrenaline). The orbicularis muscle of the upper eyelid was exposed through a lid crease incision. A muscle strip, 8 mm wide was excised starting from above the tarsus about 2 centimeters from the lateral canthal angle up to the superior orbital rim in a diagonal direction upward and laterally (Figure 2). The strip included the orbital, septal and distal part of the pretarsal orbicularis muscle. Care was taken to leave the proximal half of the pretarsal muscle intact. The lower eyelid orbicularis muscle was exposed through a sub-ciliary skin incision and 8 mm wide strip of orbicularis muscle was excised in a similar fashion to the upper eyelid. The same procedure was done on the contralateral eyelids. Incisions were closed with 5/0 Vicryl suture in an interrupted fashion. Pressure dressings were applied for 24 hours. She was prescribed prophylactic antibiotics and anti-inflammatory/analgesic medications.

On the first post-operative day, her blepharospasm had decreased. There was eyelid edema and ecchymosis. She was prescribed topical methylcellulose eye drops 4 times daily. At 3 weeks follow-up, the blepharospasm had significantly diminished and as well as the eyelid edema and she was able to open and close her eyes voluntarily (Figure 1B). Her visual acuity was 6/12 in both eyes and 6/6 with pinhole. Her upper eyelid margin reflex distance (MRD) was 3mm in both eyes. She had sustained significant relief from symptoms at 14 months of follow-up.

### Discussion

The exact pathophysiology of BEB has not been fully elucidated, however, it is thought to be multifactorial, with a likely genetic component and environmental trigger.<sup>6</sup> Proposed pathophysiologic mechanism for BEB include abnormalities in the basal ganglia and in cortical processing as well as dysfunction of the afferent pathway of the blink reflex, leading to hypersensitivity to even mild blink triggering stimuli.<sup>1,6</sup> The spasms cause involuntary blinking that can become severe and lead to functional blindness and loss of independence as seen in this case.

The mainstay of treatment of BEB is Botox injections. Botox blocks the action of acetylcholine in the neuromuscular cleft leading to temporary flaccid paralysis of the striated muscle.<sup>7</sup> It provides benefit to approximately 90% of patients.<sup>1</sup> However, treatment with Botulinum toxin requires regular injections

every 3–4 months, often at considerable cost and patients may develop tachyphylaxis over time.<sup>1,8</sup>

Surgical methods reported for treatment of BEB include orbicularis myectomy, selective peripheral facial nerve avulsion and nerve compressive stitches.<sup>8,9</sup> However, the classic surgical option to reduce spasm severity in BEB patients is total orbicularis myectomy with reports of up to 50% of patients being free from troublesome spasms 30 months after surgery.<sup>9</sup> Nevertheless, orbicularis myectomy surgery has decreased in popularity due to availability and efficacy of Botox injection as well as complications associated with it. Orbicularis myectomy can result in poor cosmetic outcomes with adherent visibly scarred skin contractures, orbital septal scarring, chronic lymphedema, and lagophthalmos.<sup>1</sup>

Currently, modified orbicularis myectomy involving selective or partial removal of the orbicularis muscle is the most frequently used surgical method for treatment of BEB with good cosmetic and functional outcomes without significant complications.<sup>10,11</sup>

Surgical treatment for BEB is often reserved for severe cases, patients refractory to Botox and those unable to have Botox due to cost or unwilling to undergo long term serial injections.<sup>2,8</sup>

Our patient was initially prescribed Botox, but despite that she could not afford its cost, it was not readily available in our locality, hence our decision for surgical intervention.

Choice of MOOM was because of the relatively insignificant complications reported to be associated with it.<sup>5</sup> The principle of the MOOM technique is based on the fact that orbicularis fibers are running in a circular manner from their origin toward insertion, hence causing blepharospasm by their sustained contraction. Excision of a block strip of the muscle creates a large gap in these fibers that breaks their continuity and prevent forcible closure of the eyelids when they contract (Figure 2).<sup>5</sup> Hence spasm is prevented

## Conclusion

Minimal orbicularis oculi myectomy was effective in providing long term significant relief of blepharospasm. This may be a viable option for the treatment of BEB in low-income countries like Nigeria.

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