The Marcus Gunn phenomenon: Discussion and report of three cases

Amit Chattopadhyay* / K. Srinivas** / B. Sharatchandra** / N. Kannan**

The Marcus Gunn phenomenon and Marin Amat syndrome (inverted Marcus Gunn phenomenon) are discussed, along with their associated features. Two patients exhibiting the Marcus Gunn phenomenon only and one patient exhibiting both the Marcus Gunn phenomenon and Marin Amat syndrome are described.

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Introduction

In 1883, Marcus Gunn described for the first time a syndrome consisting of unilateral, congenital ptosis and rapid, exaggerated elevation of the ptotic eyelid on movement of the mandible to the contralateral side. This phenomenon is known variously as Marcus Gunn phenomenon (MGP) or syndrome, jaw winking syndrome, and pterygoid levator synkinesis. A somewhat reverse phenomenon is seen in the Marin Amat syndrome, in which the eye closes automatically when the patient opens his or her mouth forcibly and fully, as during chewing. This may be associated with a flow of tears. The inverse/inverted MGP (corneoman-dibular reflex/pterygocorneal reflex) is manifested by a brisk movement of the mandible to the contralateral side when the cornea is touched; the mandible may also be thrust forward.

The present report describes three patients exhibiting MGP. Although this disorder has been reported often in the medical literature, few reports have appeared in the dental literature. Furthermore, to the best of our knowledge, we are reporting only the third case of a patient with MGP on one side and Marin Amat syndrome on the other side.

Characteristics, etiology, and treatment

Marcus Gunn phenomenon is often first observed in the infant by the mother during breastfeeding, when the eye movements are noted to be associated with sucking activity. The elevation of the upper eyelid may be stimulated by a variety of movements, including mandibular movements, tongue movements, chewing, speaking, sucking, swallowing, smiling, mouth movements, and whistling. The syndrome may also be stimulated by closing movement of the other eye.

An excellent review of the etiopathogenesis, clinical characteristics, and therapeutic management of MGP has been presented by Del-Core et al. Marcus Gunn phenomenon usually is of sporadic occurrence. Some familial cases have been reported that involve up to two generations. Brooks, however, believed most of the cases to be congenital. He reviewed cases of MGP that developed after eye surgery, syphilis, trauma, and pontine tumors. The syndrome has also been reported to disappear temporarily. No sex predilection or side predilection (left/right) is apparent.

The phenomenon may be associated with other abnormalities, such as ambylopia, double elevator palsy, anisometropia, and superior rectus muscle palsy, as well as congenital anomalies, such as ectrodactyly, bilateral pes cavus, spina bifida, forefoot adduction, bilateral undescended testis, and cleft lip.

The etiology of MGP is obscure. It was originally assumed that the syndrome was caused by aberrant innervation of the levator palpabreus superioris from the motor branch of the trigeminal nerve because of
the close approximation of the nuclei of the occulo-motor and trigeminal nerves. However, a supranuclear, or at least a combined supranuclear-nuclear, involvement has been suggested. Other theories, such as genetic origin and phylogenetic atavism, have also been suggested to explain the etiology of MGP. These theories and other aspects of MGP have been excellently reviewed by Brooks, Del-Core et al., Pratt et al., and Simpson.

Management of MGP has been quite varied and mainly revolves around correction of the ptosis. Although claims of spontaneous correction of MGP have been made, it has not been documented properly. One long-term follow-up study could not find such a correction. Many cases remain untreated, and the patients soon learn to mask the condition by performing certain other movements or at times just do not care. Simpson mentioned that many adults learn to hide the lid retraction by slightly bending their heads downward and looking up; this action results in a raised lid position, minimizing the "jaw-winking" and ptosis. For this reason, mild cases of MGP may be successfully managed without surgical intervention.

Surgical procedures used to alleviate MGP include levator transposition and bilateral frontal sling, bilateral levator muscle excision and autogenous fascia lata brow suspension, the Fasanella-Servat procedure, the Beard procedure, brow suspension using nonabsorbable suture, and the modified Berke-Neuhau procedure. Most of the surgically managed cases have been reported to have good results. However, many patients may require two or more operations to achieve acceptable functional and esthetic results.

Case reports

Three patients with MGP were observed in the Department of Oral Medicine and Radiology, SDM College of Dental Sciences, Dharwad, India, between January and September 1993. All the patients had come to the hospital for complaints other than MGP. None of them reported any significant family or medical history.

Case 1

A 22-year-old man reported for restoration of his teeth. The right eyelid was congenitally ptotic and exhibited MGP on mandibular movements (Fig 1). Thorough ophthalmologic and neurologic evaluation failed to reveal any other abnormalities. A computerized tomographic (CT) scan revealed pneumatized anterior clinoid processes of the sphenoid bone.

Case 2

A 65-year-old man reported for treatment of his chronic periodontal problems. This patient was not aware of his jaw-winking movements (Fig 2). The right upper eyelid was ptotic and opened widely when the mandible was moved to the contralateral side. Ophthalmologic and neurologic evaluations and a CT scan did not reveal any other abnormality.

Case 3

A 14-year-old boy reported because he was experiencing pain in his carious teeth. The right upper eyelid...
Fig 2 Marcus Gunn phenomenon: The ptotic right eyelid shows exaggerated opening on mandibular movement.

was found to be ptotic and moved wide open on mandibular movements to the contralateral side. However, the left upper eyelid was wide open at normal gaze and drooped down when the mandible was moved to the opposite side. This patient therefore exhibited MGP on the right eyelid and Marin Amat syndrome on the left side. The patient had no history of trauma or facial paralysis. This was specifically enquired about many times because Marin Amat syndrome is often associated with trauma or facial paralysis. Comprehensive ophthalmologic and neurologic work-ups and a CT scan revealed no other abnormalities. This is only the third report of both MGP and Marin Amat syndrome in the same patient.

Discussion
Establishing a diagnosis of MGP is within the domain of the dental surgeon. Marcus Gunn phenomenon may be associated with a variety of other ophthalmologic, neurologic, and other congenital disorders, which, at times, are not obvious. Therefore, a comprehensive medical evaluation of the patient and a detailed history are mandatory. When possible, a family history may be established if MGP appears in the family.

Dental practitioners must take special care with patients who exhibit MGP because the eye remains wide open when the various dental procedures are being performed, thereby increasing the risk of eye injuries to the patient. The patient must therefore be required to wear eye shields at all times during dental procedures.

Fig 3 Marcus Gunn phenomenon: The ptotic right eyelid opens wide on mandibular movement. Marin Amat syndrome: The left eyelid, which is normally wide open, droops down during mandibular movement to the contralateral side.
Dental surgeons can also play a very useful role in convincing and preparing patients psychologically to procure surgical treatment for their ptosis.

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References


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