

Botulinum Toxin Therapy in Congenital Blepharospasm

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Key Words

Congenital blepharospasm · Botulinum toxin · Child

Abstract

Botulinum toxin injections are the treatment of choice for the management of essential blepharospasm in adults. No cases of congenital blepharospasm have been described in the literature so far, and no cases of botulinum toxin injection in an infant have been reported. A 4-week-old girl was referred to our department with absent eye opening and spasmodically closed eyes. Pregnancy and delivery had been normal. A neuropsychiatric examination did not reveal useful findings. A periorbital injection of botulinum toxin was performed at the age of 2 months to prevent deprivation amblyopia. Four days later, clearly visible bilateral eye opening and commencement of eye contact were observed. At the age of 3 years, her eyelids remain open and no side effects of botulinum toxin therapy have occurred.

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Introduction

In adults, routine injections of botulinum toxin are the treatment of choice for the management of essential blepharospasm [1, 2]. The clinical picture is characterized by recurrent involuntary spasms in the region of the orbicularis oculi muscle. Typically, at the time of the first manifestation, the patients are in their 5th to 7th decade of life [3]. Until today, >2,500 patients presenting with this clinical picture have been treated with botulinum toxin in the Department of Ophthalmology of the University of Bonn, Bonn, Germany. Among these patients, the youngest were 18 years old. In children and adolescents, blepharospasm mostly occurs as reflex phenomenon in conditions of the anterior eye segment such as, for instance, corneal affections or trichiasis, in the sense of the defense triad consisting of blepharospasm, photophobia and epiphora.

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So far, congenital blepharospasm devoid of conditions of the anterior eye segment has not been described in the literature. The treatment of children affected by cerebral palsy with botulinum toxin is considered safe and effective, but is only approved for children >2 years of age. Other authors described off-label-use in younger children, the youngest being 11 months old [4].

Case Report

A 4-week-old girl was referred to our department because of absence of eye opening. Since her birth, her eyes had been swollen and mainly spasmodically closed. Only briefly and more in the evening, slit-like eye opening occurred for a maximum of 1 h (fig. 1a). Then, the child turned her face towards light sources. The morphologic assessment was hampered by massive blepharospasm (fig. 1b). The child reacted with eyes closed to direct flashlight in the dark, e.g., by turning away or grimacing. Immediate massive blepharospasm was present even when lid opening was attempted in her sleep or following administration of local anesthetic eyedrops.

Pregnancy and delivery had been normal. A neuropediatric examination including ultrasound study of the brain was unremarkable. At the age of 2 months, an examination under general anesthesia was performed which revealed regular organ findings devoid of ocular irritation. During anesthesia, marked regression of spasms was observed. Hence, periorbital injection of botulinum toxin (6.25 IU Xeomin® in each eye at 6 injection sites each equivalent to half of the starting dose of adults with essential blepharospasm) was performed to prevent deprivation amblyopia.

Four days later, markedly visible bilateral eye opening was observed (fig. 1c). For the first time, the child started eye contact and briefly followed with her eyes. The mother reported that lid opening occurred spontaneously throughout the day. Complete lid closure was feasible. Four weeks later, the mother reported that both eyes continued to be opened and closed smoothly. The deep-seated eyes were opened slit-like with free pupils, pronounced inward squinting and reduced abduction capacity (abduction only to midline). At the age of 7 months, alternating esotropia and only slightly impaired abduction with persistent lid opening was observed. Hence, alternating occlusion therapy was initiated. Meanwhile, the child had established a good eye contact ability and was able to follow objects.

Further ophthalmologic follow-up examinations conducted to the current age of 3 years revealed regular eye opening and complete lid closure without recurrence of blepharospasm (fig. 1d). Right-sided intermittent esotropia is present with slightly impaired abduction. No side effects of botulinum toxin therapy have occurred.

A signed patient consent-to-disclose form has been obtained for photos of the patient.

Discussion

The child presented in this case report is the youngest patient ever treated with botulinum toxin. Typical indications for botulinum toxin in young children are spasticity of the upper or lower limbs due to infantile cerebral palsy [4]. Botulinum toxin reduces spasticity, avoids contractures and delays surgery, but is not able to improve the achievement of motor milestones. The safety profile of botulinum toxin was similar to older children except for two

cases of acute respiratory events in children with severe cerebral palsy, mask anesthesia and high-dose botulinum neurotoxin therapy.

In our case, a single periorbital injection of botulinum toxin induced lid opening already persisting for nearly 3 years. In typical essential blepharospasm in adults (focal dystonia), botulinum toxin injections are only effective for about 3 months. This may be indicative of a different pathomechanism. Blepharospasm may occur in children with Schwartz-Jampel syndrome, a rare neuromuscular disorder with autosomal recessive inheritance characterized by myotonia, distinctive facial features including blepharospasm and a puckered chin, short stature as well as skeletal dysplasia [5]. A case of congenital blepharospasm without other neurologic signs has never been described in the literature before. It may be due to some delayed midbrain maturation. In older children, blepharospasm devoid of ocular irritation or lid abnormalities (reflex blepharospasm) may be due to habit tics or psychogenic blepharospasm [6].

A direct influence of the periorbital botulinum toxin injection on the abduction deficit seems virtually impossible. Targeted injections into the lateral rectus muscle might cause such deficit. Diffusion from the region of the orbicularis oculi muscle into both extraocular muscles seems pathophysiologically impossible. Hence, one may assume that the abduction deficit had already preexisted and could hardly be examined before the botulinum toxin injection due to blepharospasm.

The botulinum toxin injection resulted in a normal visual development of the child; otherwise, sensory deprivation would have occurred. Botulinum toxin can therefore be helpful to treat special conditions even in very young children without relevant side effects of the neurotoxin.

Disclosure Statement

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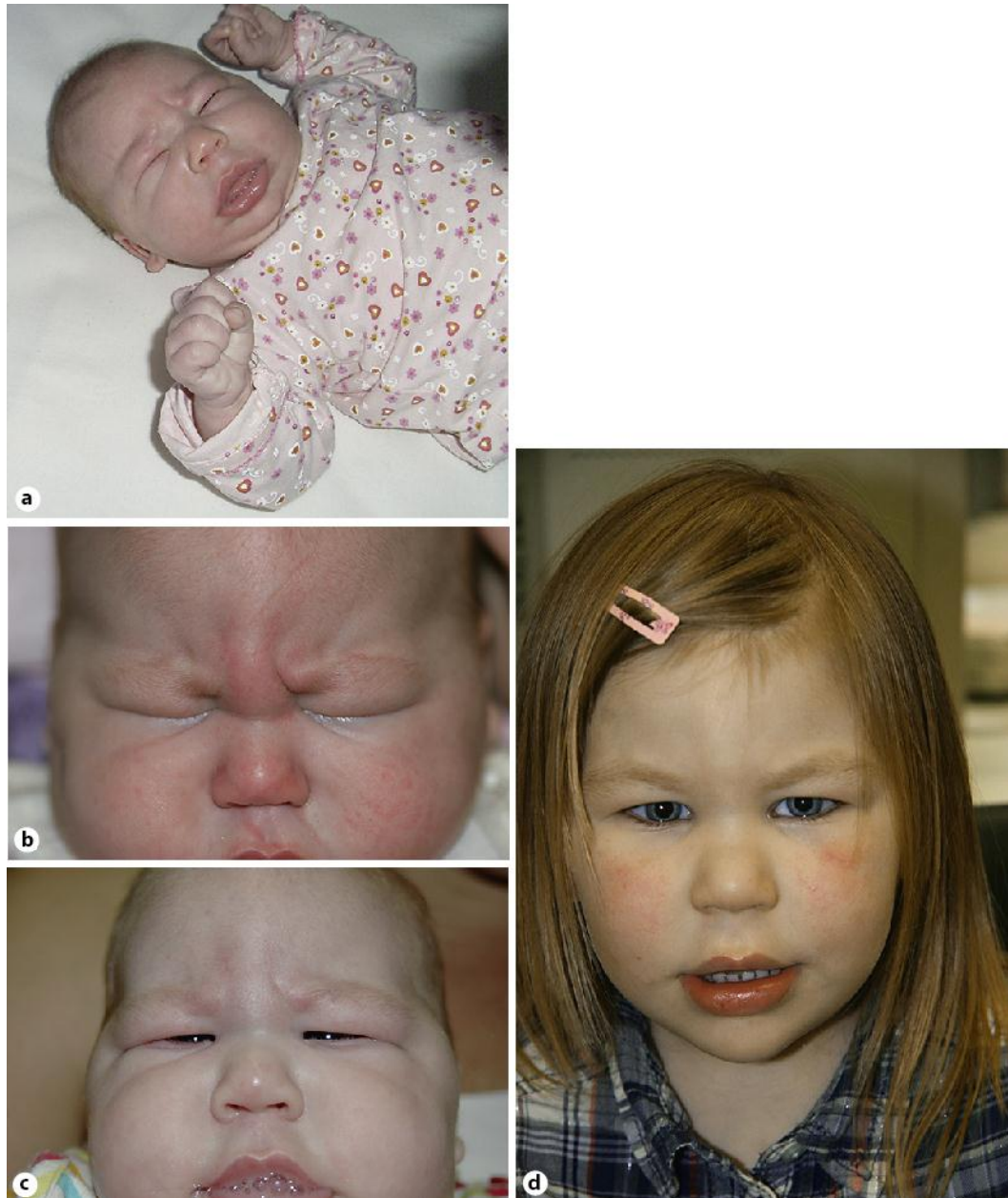


Fig. 1. **a** Status during the day at 3 weeks of age (picture taken by parents). **b** Typical findings during examination at 7 weeks of age. **c** Four days after injection of botulinum toxin at 2 months of age. **d** Picture of the girl at 3 years of age (after a single botulinum toxin injection at the age of 2 months).