

CASE REPORT

BOTULINUM TOXIN TYPE A IN THE HEALING OF A CHRONIC BUTTOCK ULCER IN A PATIENT WITH SPASTIC PARAPLEGIA AFTER SPINAL CORD INJURY

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Background: Pressure sores are a significant secondary complication in spinal cord injured patients. A new indication for botulinum toxin type A is described here, in treatment of recurrent muscular spasms that had hampered the healing of a chronic buttock ulcer in a subject with severe spastic paraplegia.

Case report: A 27-year-old man with spastic paraplegia following traumatic spinal cord lesion at the thoracic level had developed recurrent severe muscular spasms, particularly involving the buttock region, with an Ashworth scale score of 3–4 and a Spasm Frequency Scale of grade 4. The patient had a pressure ulcer in the left gluteal region (grade IV according to the European Pressure Ulcer Advisory Panel (EP-UAP)). Several treatments were administered without success, and all efforts at healing the ulcer by topical medication were hampered by recurrent spasms involving the buttock muscles and ulcer region. The left gluteus maximus muscle was treated with 2 infiltrations of 660 IU botulinum toxin type A. The use of botulinum toxin type A allowed better care of the pressure ulcer, which had healed by 6 months after the initial infiltration.

Conclusion: The use of botulinum toxin type A may be an important adjunctive therapy for treatment of pathological conditions involving recalcitrant involuntary muscle contraction.

Key words: botulinum toxin, ulcer, spasm, spinal cord injury.

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INTRODUCTION

Botulinum toxin type A (BTx-A) has been used predominantly in neurological disturbances for patients with involuntary movements, particularly hemifacial spasm and dystonia (1). BTx-A has also recently become an important therapeutic agent with widespread applications in several medical disorders, such as gastrointestinal (2), genitourinary dysfunction (3) and plastic surgery (4). In rehabilitation, BTx-A is indicated for

the treatment of focal spasticity, spasms and for prevention of contractures and bone dislocation (5). Pressure sores are a significant secondary complication for many patients with spinal cord injury (SCI) with spastic tetraplegia or paraplegia (6–8). These conditions are associated with morbidity, re-hospitalization, mortality, as well as poor quality of life in patients with SCI (8). A new indication for BTx-A, as described in this case report, is in the treatment of recurrent muscular spasms that had hampered the healing of a chronic gluteal ulcer in a subject with severe spastic paraplegia following SCI.

CASE REPORT

A 27-year-old man with paraplegia following a traumatic spinal cord lesion at the thoracic level that had occurred when he was 22 years old had developed severe spasticity and muscular spasms involving the lower limbs and the buttock region in particular. Movements were spontaneous or elicited by slight touch and sensorial stimulation. The spasticity and spasms were evaluated by the Ashworth scale and the Spasm Frequency Scale (SFS) (9), respectively. The SFS is a self-rated assessment of how often spasms occur, which is measured using an ordinal scale from 0 (no spasms) to 4 (greater than 10 spontaneous spasms per hour). Spasms are measured by the number of spontaneous muscle spasms that occur over a 1-h period. In this case, the Ashworth scale score was 3 and the SFS score was 4. Single or multiple systemic anti-spasticity drugs, including baclofen, tinazidine and dantrolene, were administered at the highest tolerated dosage without effect. Intrathecal baclofen therapy was attempted, but the patient refused application of the device.

Despite rehabilitation treatment and the recommended preventative measures, a pressure ulcer in the left gluteal region occurred at 24 years of age. Several treatments were attempted without success, and all efforts at healing the ulcer by topical medication were hampered by recurrent spasms involving the gluteal muscles and the ulcer region. At the age of 25 years, local BTx-A infiltration of adductor and flexor muscles of the hip and knee was initiated in order to reduce lower limb spasticity and prevent muscular contraction. Adductor and ischio-cruralis muscles of both legs were infiltrated with a total dosage of 1700 IU BTx-A (Dysport®, Ipsen Ltd, Slough, UK) in a single session. After BTx-A injection, a reduction in



Fig. 1. Irregular, deep pressure ulcer (stage IV) in the buttock region.

limb spasticity was observed (Ashworth grade 2), but spasms involving the buttock and ulcer region persisted.

BTx-A injections were then administered to relieve the gluteal muscular contraction and to allow medication of the ulcer. Before BTx-A infiltration, the ulcer had irregular borders and was graded as stage IV according to European Pressure Ulcer Advisory Panel (EPUAP) wound classification system (10) (Fig. 1). The middle component of the left gluteus maximus and the muscular zone around the ulcer were treated with 150 IU and 60 IU at each point of infiltration, respectively, for a total of 660 IU BTx-A (Dysport®) (Fig. 2). Electromyographic guidance was not used, since the gluteus maximus muscle is easily visible. One month after the first BTx-A infiltration, the spasms involving the ulcer region had reduced, and it was possible to apply topical hydrocolloid and polyurethane hydrogel products for treatment of the ulcer. A second infiltration with the same BTx-A dosage was performed after 3 months to weaken muscular contraction during spasms and promote ulcer healing. The use of BTx-A

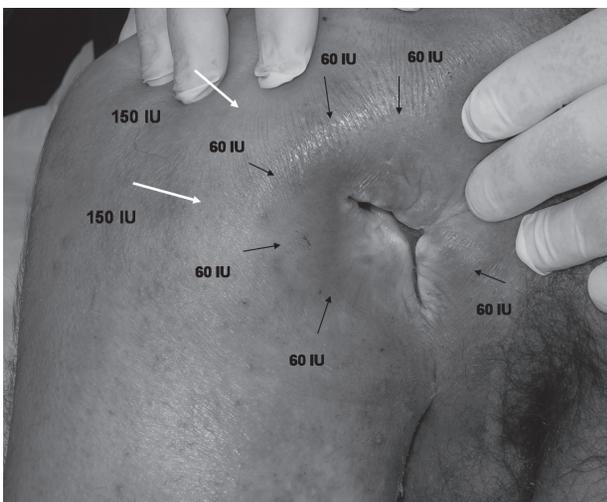


Fig. 2. Botulinum toxin type A (BTx-A) injection sites. A dose of 60 IU BTx-A (Dysport®, Ipsen Ltd, Slough, UK) was used for each site around the ulcer region (black arrows) and 150 IU for each site in the middle part of the left gluteus maximus (white arrows).



Fig. 3. Six months after the first infiltration, successful application of conventional topical therapy had healed the ulcer.

allowed for better care of the pressure ulcer, which had healed 6 months after the initial infiltration (Fig. 3).

DISCUSSION

Despite rehabilitation, assistive technique device improvement, and recommendations for prevention, pressure ulcers are notoriously a common and challenging complication in patients with SCI with spastic tetraplegia or paraplegia. Pressure ulcers are the second cause of re-hospitalization after an SCI, demanding a complex multidisciplinary approach. The present case history describes the successful use of BTx-A in the treatment of a chronic, buttock ulcer for which common topical medications were ineffective due to repetitive gluteal muscles spasms.

Studies and case reports have since described the new and continuously expanding therapeutic directions for BTx-A. This treatment has also been used to promote wound healing in body regions such as anal fissures (11). A growing use of BTx-A is for the prevention of facial scar enlargement and the improvement of facial wound healing. We reported recently the efficacious use of BTx-A in the healing of a chronic, untreatable labial ulcer following oro-mandibular dyskinetic movement in a patient in a vegetative state (12). To our knowledge, this is the first report concerning the use of BTx-A as an adjunctive therapy for pressure ulcers when healing is hampered by muscular spasms. On the basis of published reports, and its well-known muscle weakening action, it was thought that BTx-A injections could decrease the patient's movement disorder and improve buttock ulcer healing. Indeed, BTx-A injection reduced hyperactive involuntary movements and promoted ulcer healing following topical medication. As in healing of anal fissures, BTx-A facilitates ulcer healing by several mechanisms including reduction in muscular hyperactivity, improvement in blood microcirculation at the ulcer site and release of glyceryl trinitrate. In the rehabilitation setting, appropriate adjunctive use of BTx-A targeted at overactive muscles

can provide a window of opportunity for treating some of the complex clinical deficits and disorders affecting these patients. The complexity of neurological and functional abnormalities in patients who undergo rehabilitation demands an integrated approach tailored to the specific needs of the patients over time. In the case described here, involuntary repetitive muscular spasms impeded healing of the ulcer by common topical therapies. Pressure ulcers have a complicated, multi-factorial aetiology and pathogenesis. No single treatment, including the use of BTx-A, can be considered an efficacious and decisive strategy to heal pressure ulcers. In the reported case, it is important to emphasize that the contribution of BTx-A is restricted to, mainly, breaking the vicious circle of spasticity and afferent nociceptive stimuli from an ulcer failing to heal, partially due to spasticity-induced contractures and possible anomalous positioning of the subject with uneven pressure distribution.

In conclusion, we suggest that the use of BTx-A as an adjunct to other interventions is an important therapeutic aid for clinicians treating pathological conditions made difficult or impossible by involuntary muscle contraction.

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