Radiation-induced Alopecia Treated with Botulinum Toxin Type A Injection

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Sir:

Botulinum toxin type A (BTXA) has been in use for more than 20 years in the treatment of various neurological conditions and aesthetic treatments.[1,2] BTXA is also occasionally used to treat alopecia; however, the efficacy of BTXA in alopecia remains unclear.

A 65-year-old woman presented with a history of diffuse hair loss in the frontoparietal scalp after carniosurgery and radiotherapy for a meningioma 1 year before her visit. Physical examination revealed diffuse hair loss and a linear depression on the frontoparietal scalp caused by surgery (Fig. 1). Because she refused our suggestion for biopsy to evaluate the degree of fibrosis, we diagnosed her condition as radiation-induced alopecia based on clinical evidences.

We initially treated her with an intralesional injection of triamcinolone acetonide (5 mg/ml) monthly and with a 308-nm excimer laser (Xtrac laser, Photomedex, Montgomeryville, PA.) every other week for 1 year. However, the patient's response to these treatments was limited. Thus, we decided to combine the above treatments with injection of BTXA (Botulax; Hugel Pharma, Seoul, Korea). To this end, we injected 150 U of Botulax (5 U per 0.1 ml saline) into the muscles surrounding the patient's scalp, including the frontalis, temporalis, periauricular, and occipitalis muscles, in doses divided equally over 30 injection sites every 3 months for 12 months. After 3 months, sparse vellus hairs were observed, and after 12 months, hair density and thickness were improved, and she had some hair growth on the frontal scalp. The scalp was also slightly softer and more sanguine in appearance compared with the scalp before botulinum toxin injections were initiated (Fig. 2).

In our case, BTXA induced idiopathic hair growth, although the mechanism by which this took place remains unclear. We speculated that BTXA injections facilitated tension relief of muscles surrounding the scalp and increasing perifollicular blood flow decreased by radiation damage.[3] A pilot study by Freund and Schwartz[4] reported treatment of male pattern baldness with botulinum toxin. They asserted that BTXA "loosens" the scalp, which in turn reduces pressure on the perforating vasculature to allow for increased blood flow and oxygen concentration. Likewise, in Cutrer and Pittelkow's[5] case

Fig. 1. Before BTXA injections. Hair density was significantly reduced and the scalp appeared to be fibrotic.

Fig. 2. Twelve months after BTXA injection. Hair density and thickness were improved and the scalp seemed sanguine.

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report of alopecia areata (AA) treated with BTXA, they suggested that the effects of BTXA on inhibition of substance P and calcitonin gene-related peptide would likely influence the neuroimmunologic pathogenesis of AA. This mechanism may have also influenced the idiopathic hair regrowth observed in our patient.

In contrast with successful outcomes achieved with BTXA, Cho et al[1] reported negative results of BTXA treatment in AA. They suggested that BTXA injection cannot be used as an alternative treatment for recalcitrant AA.

The effect of BTXA on hair regrowth remains both unclear and controversial. Our case may act as a positive support for BTXA treatment although further studies are needed to identify the mechanisms and efficacy of BTXA.

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DISCLOSURE

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