Journal of Cosmetic and Laser Therapy
Publication details, including instructions for authors and subscription information:
http://www.informaworld.com/smpp/title~content=t713399564

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Online Publication Date: 01 January 2007

To cite this Article Levy, Phillip M.(2007)'The 'Nefertiti lift': A new technique for specific re-contouring of the jawline',Journal of Cosmetic and Laser Therapy,9:4,249 — 252
To link to this Article: DOI: 10.1080/14764170701545657
URL: http://dx.doi.org/10.1080/14764170701545657

Journal of Cosmetic and Laser Therapy. 2007; 9: 249–252

informa
healthcare

CASE REPORT

The 'Nefertiti lift': A new technique for specific re-contouring of the jawline

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Abstract
Botulinum toxin type A (BoNTA) is now used extensively for rejuvenation of the forehead, glabellar and periocular regions and there is increasing focus on treatment of the lower face. Although there is well-documented evidence for the efficacy of botulinum toxin in the correction of platysmal bands, little work has been done to explore its potential role in rejuvenation of the jawline. To date, effects in this area have been reported as a consequence of platysmal banding treatment and are inconsistent. Hesitancy to explore treatment may be due to evidence of a greater, more durable response to the toxin in the lower facial muscles as well as reports of increased potential migration and subsequent side effects.
This paper describes a new technique using BoNTA (Vistabel®; Allergan, Irvine, CA, USA) to drape the skin of the jawline contour and provide the visual effect of a 'mini lift'. Experience with 130 patients with doses of BoNTA up to 20 U is described. Patient satisfaction is extremely high and the specificity of dosing and technique has led to a low incidence of adverse effects. The 'Nefertiti lift' is a minimally invasive, effective and acceptable alternative for those patients seeking an effective way to push back surgery.

Key words: *Botulinum toxin type A, mandibular jawline, Nefertiti*

Introduction

Over the last two decades, the use of BoNTA in aesthetic enhancement has dramatically increased. With almost immediate effect and no recuperation time, more and more patients are seeking treatment and BoNTA is rapidly replacing surgical intervention in many areas of the face. As a consequence, facial rejuvenation is now more accessible to a wider demographic of patients and botulinum toxin has become the most widely used cosmetic procedure in the USA (1). Early treatment has focused on the upper and mid-face, particularly the glabellar, forehead and periocular areas. However, as treatment smoothes out the rhytides and deep folds in the upper and mid-face, imbalance can be created with other areas of the face; for example, in the lower face and neck. Increasingly, physicians are injecting into the perioral and neck regions to restore the balance (2).

There is documented clinical evidence for the efficacy and safety of botulinum toxin A (BoNTA) in facial enhancement (2–4). The long-term safety of BoNTA in all facial areas has been confirmed in a retrospective study of 50 patients participating in a total of 853 injection sessions (3). Other studies report the lack of long-term adverse effects and the absence of any systemic safety issues (4).

Use of BoNTA in the lower face is becoming increasingly popular. Increasingly, techniques are being developed with the aim of providing a similar aesthetic enhancement to that previously only achieved with a surgical procedure (4). Most of the methodologies in the neck area have focused on the platysmal bands, with inconsistent reporting of effects on the jawline to date (5–7). The first documented clinical use of BoNTA in this area was by Brandt and Bellman (5). They identified that injecting the toxin directly into the platysmal bands reduced the horizontal rhytides and skin laxity that developed over the muscle with advancing age. Although the authors were not aiming to treat the jawline, they noticed ''an overall tightening of the neck and re-contouring of the jawline'' (5). The reported doses of 50–100 U per treatment, sometimes as high as 200 U in one session, were not without side effects. Although reversible, adverse reactions such as transient oedema and ecchymoses, haematoma formation, muscle soreness or neck

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(Received 26 June 2007; accepted 28 June 2007)

ISSN 1476-4172 print/ISSN 1476-4180 online
DOI: 10.1080/14764170701545657

discomfort and headaches were reported (5). Several patients experienced mild neck weakness for a period of 1–2 weeks (5).

Kane reported some subjective improvement in neck contouring in 44 patients injected with increasing doses of BoNTA (up to 20 U each) in the platysmal bands (6). There was no report of any reduction in jowling or raising or tightening of the skin (6). Other clinical observations of improvements in the neck have been reported, but again not without side effects (7). Park et al. reported some re-definition of the jawline with BoNTA in Korean patients, with transient side effects of masticatory and speech disturbances (7).

Compared with delivery in the other areas of the face, response to BoNTA is greater and longer-lasting. In addition, an increased potential for migration into the surrounding muscles has been observed at higher doses (4). Precise dosing and technique are therefore essential when injecting in this area in order to minimize the risk of reported adverse events such as dysphagia, dysphonia and anterior neck weakness (8). As clinical experience has increased, adverse effects have become limited to mild dysphagia and use of even lower doses has now reduced or banished the effect. Therefore, BoNTA is now a successful alternative to surgery in this area.

Using BoNTA to focus specifically on redefinition of the jawline has led to the development of a new technique described here as the 'Nefertiti lift' (Figure 1: the perfect mandibular contour). The technique aims to lift and improve the definition of the mandibular border and angle, elevate the corners of the mouth and drape the skin of the jawline contour giving the visual effect of a 'mini lift'.

Figure 1. Nefertiti: the perfect mandibular contour.

Figure 2. Assessing the potential efficacy of the procedure in individual patients.

Patients and methods

Over a period of 6 months (between November 2006 and April 2007), 130 patients were treated with BoNTA (Vistabel®; Allergan, Irvine, CA, USA). All patients were female with an average age of 47 years. The majority (n=120) of the patients had received BoNTA treatment in another area of the face on at least one occasion. Prior to injection, each patient was assessed to determine whether treatment would be effective. Patients were asked to pull down hard on the platysma muscle as shown in Figure 2. Disappearance of the mandibular border with this action indicated the potential for successful treatment.

All patients were injected with 2–3 U BoNTA (Vistabel, Allergan) along and under each mandible and to the upper part of the posterior platysmal band for a total of 15–20 U per side as shown in Figure 3. In each case, the patient was asked to contract the platysma muscle and the prominent band was grasped and injected at the points shown in Figure 3.

Figure 3. Vistabel® injection points along the mandible and posterior platysma band.

Patient follow-up with this technique was identical to other procedures with BoNTA. Patients returned at 2 weeks for an assessment if they desired. Touch-ups were only needed in three patients; all with particularly prominent posterior platysmal bands. The average duration of effect was 6 months.

Results

A total of 126 patients achieved an immediate and visible release of the downward pulling of the platysma muscle and, at follow-up 2 weeks later, had a noticeable re-contouring and elevation of the skin at the jawline. The range of effect ranged from mildly to highly successful as can be seen in Figure 4 (A–C).

Four patients experienced minor adverse events; two with mild dysphagia and excess 'lifting' muscular effect (but these resolved within 4 weeks).

Two patients presented with very slight unilateral rapidly reversible smile incontinence due to partial chemodenervation of depressor labialis. This was technique-dependent and avoidable if injections were never more anterior than a line drawn from the

Figure 4. (A–C) Before and after injections with botulinum toxin A to create the 'Nefertiti lift'.

naso-labial fold down to the mandible. There were four treatment failures. Lack of efficacy in these patients was probably due to the presence of excessive fat on the mandibular border.

Discussion

The effects seen on the jawline are a consequence of the pathophysiology of the neck during the aging process and are described in detail by Brandt and Boker (9). The skin in the neck undergoes identical senescent changes to other areas of the face. Skin thinning, increased laxity and loss of elasticity in the skin, coupled with volume depletion and gravity all exacerbate the aging effect. The platysma muscle complex constantly pulls downward, leading to the development of jowling and multiple rhytides. In some circumstances, herniation of the subplatysmal fat pad through the muscle borders leads to fullness in the neck and contributes to the loss of mandibular definition.

The success of this technique is due to manipulation of the opposing effects of the platysmal complex with BoNTA. In this area, the jawline can basically be separated into elevator and depressor movements or tensions. Over time, the platysma muscle contracts and pulls down on the cheeks and jawline (depressor effect). This effect is not precise and creates an ill-defined jawline and angle. Injecting with BoNTA releases the downward tension on the jawline and alleviates the depressor effect. This removes the pull-down depressor effect on the cheek and releases the skin to the elevator muscles lifting action.

This technique is a site-specific treatment with minimum adverse effects. Early experience of mild dysphagia and excess muscular contraction in the upper face has been addressed by lowering the dose, avoiding injecting too deep into the neck area and injecting under the mandible posterior to the naso-labial folds. A maximum of 20 U each side is recommended to avoid adverse effects and the unwanted effects of over-treatment in the upper face.

The undesired muscle weakening reported with BoNTA in earlier studies in the neck area was caused by diffusion or migration of the toxin into the muscles surrounding the injection site (4). These side effects can be minimized or avoided completely by careful dosing and good injection technique. However, evidence suggests that the type of BoNTA used can also affect migration. Studies between BoNTA and BoNTB have shown that BoNTA has a reduced potential for migration when compared with BoNTB (9). Similarly, different migratory effects have been noted between types of BoNTA (10). A study comparing BoNTA[1] (Allergan, Inc) and BoNTA[2] (Ipsen Ltd) reported a smaller area of migration for BoNTA[1] (Allergan, Inc) (10).

Techniques such as this have been positioned as a useful rehearsal or 'trial run' for more extensive surgery and that indeed may prove to be a valuable function in the future (4). However, for many patients, surgical enhancement is neither possible nor desirable and use of BoNTA to create the 'Nefertiti lift' provides an opportunity to complete the facial rejuvenation journey in a minimally invasive way.

Acknowledgements

I thank Raphäelle Levy for her artist's impressions of Nefertiti and Lynn Hamilton for her editorial assistance.

Conflicts of interest

Phillip M. Levy has worked as an independent consultant for Allergan Pharmaceuticals. No funding was received for this study.

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