

# Treating a Bell's Palsy Patient

Dr Nestor Demosthenous discusses the use of botulinum toxin, dermal filler and threads to improve a Bell's Palsy patient's facial asymmetry

## Aetiology

Bell's Palsy is an acute, unilateral, peripheral, lower motor-neuron facial nerve paralysis, and the most common cause of unilateral facial paralysis worldwide.<sup>1</sup> It affects 60-70% of unilateral facial paralysis sufferers,<sup>1</sup> and in 80-90% of cases gradually resolves over time.<sup>1</sup> The aetiology and pathophysiology of Bell's Palsy is unclear. It is thought to be a polyneuritis disorder with possible viral, inflammatory, autoimmune, and ischaemic influences. Good evidence suggests that herpes simplex type I and herpes zoster virus reactivation from cranial-nerve ganglia play a role in its development.<sup>2</sup> The facial nerve courses through the temporal bone at the facial canal. Oedema and ischaemia may result in compression of the facial nerve at this point (peripheral to the nerve's nucleus). This compression has been seen in MRI scans with facial nerve enhancement.<sup>3</sup>

Bell's Palsy affects between 20-40 people for every 100,000 in the UK each year.<sup>4</sup> Peitersen *et al*<sup>5</sup> found that one third of patients had an incomplete paralysis, while the remaining two thirds suffered from complete paralysis. Of these patients, 85% showed signs of recovery within three weeks of developing Bell's Palsy, 71% had complete recovery, 13% had slight sequelae, and 16% had residual weakness, synkinesis and/or contracture. Patients with incomplete lesions had a 94% rate of return to normal function, while only 60% of those with clinically complete lesions returned to normal function.

## Diagnosis

The diagnosis of Bell's Palsy must be made on the basis of a thorough history and physical examination, as well as the use of diagnostic testing when necessary. It is a diagnosis of exclusion. Onset is typically sudden, with symptoms peaking in less than 48 hours. These include the acute onset of unilateral upper- and lower-facial paralysis, auricular pain, decreased tearing and blurred vision, as well as taste disturbances.<sup>5</sup> Paralysis can take place on the forehead and lower aspect of the face. Late manifestations include mild, generalised mass contracture of the facial muscles, rendering the affected palpebral fissure narrower than the opposite one, aberrant regeneration of the facial nerve with motor synkinesis, reversed jaw winking (i.e. contracture of the facial muscles with twitching of the corner of the mouth or dimpling of

the chin occurring simultaneously with each blink).<sup>2</sup> Facial spasm is a very rare complication of Bell's Palsy and occurs as tonic contraction of one side of the face.<sup>2</sup>

To objectively describe facial function, the House-Brackmann facial nerve grading system is most commonly used. It is a widely accepted system, which, in my opinion, is simple, sensitive, accurate and reliable. It grades facial function in six steps from normal (HB I) to total paralysis (HB VI).<sup>6</sup>

## Treatment options

Treatment of Bell's Palsy should be supportive and guided by the severity and probable prognosis in each particular case. Studies have shown the benefit of high-dose corticosteroids for acute cases.<sup>7</sup> Rehabilitative treatment includes eye care (eye drops for lubrication) and physiotherapy (incorporating facial muscle exercises to improve muscle tone and strength).<sup>8,9</sup> Botulinum toxin injections can be used to treat either the affected or the unaffected side of the face in some people with long-term Bell's Palsy, by relaxing any facial muscles that have become tight, or to reduce muscle activity of the unaffected side and balance the movement of the face.<sup>8</sup>

In cases where the palsy is prolonged, surgical management is best. Procedures are aimed at protecting the cornea from exposure, and achieving facial symmetry. These include cross-facial nerve grafts, nerve transfers and muscle and tendon transfers.<sup>9</sup> Nerve function cannot be restored, but surgery serves to reduce the need for constant use of lubrication drops, improve the position of the mouth, and help with speech, eating, drinking and facial symmetry.<sup>10,11</sup>

## Side effects

There are currently no published studies regarding risks and complications following the use of Silhouette Soft threads. Risks of both thread treatment and dermal fillers include, more commonly, bruising and swelling, and far less commonly, haematoma and infection. As advised by Sinclair Pharma, there have only ever been three reported cases of infection following treatment with Silhouette Soft, all of which were treated with a course of oral antibiotics. Further risks from using threads are anecdotal, based on my personal and colleagues' experience, and include puckering and dimpling of the skin, which almost always resolves within the first few days. There is a theoretical risk of sensory nerve injury, as would be expected with any procedure using an instrument in the subcutaneous layer, however, I have not seen this in my practice or heard of it amongst colleagues.

The aetiology and pathophysiology of Bell's Palsy is unclear. It is thought to be a polyneuritis disorder with possible viral, inflammatory, autoimmune, and ischaemic influences

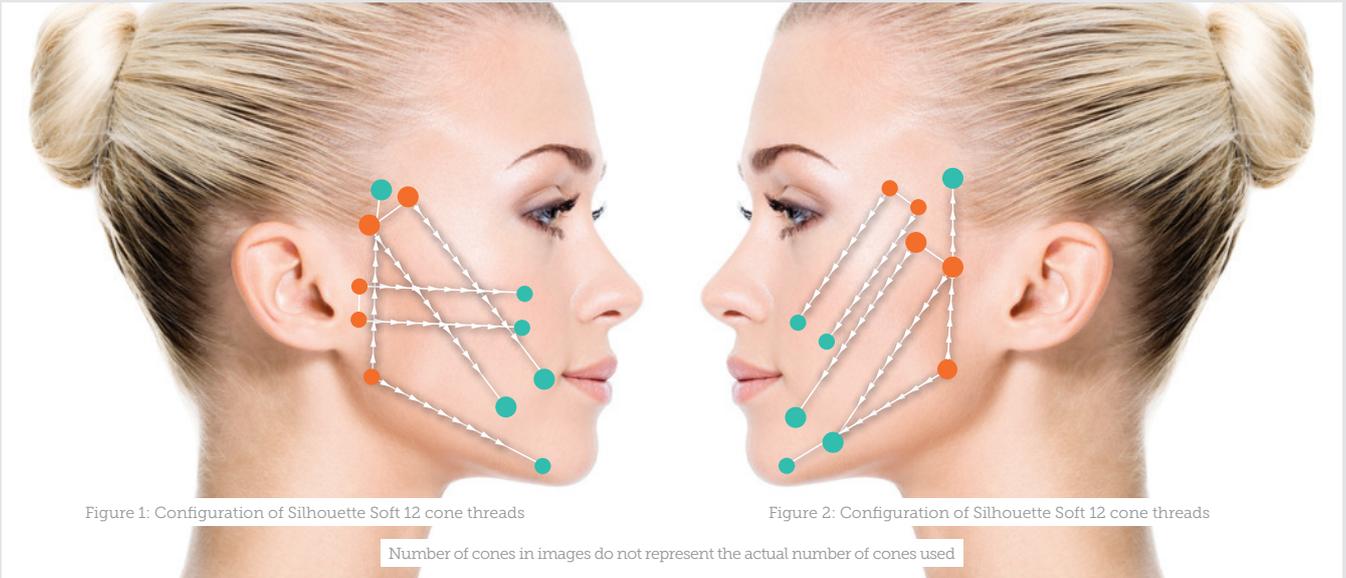


Figure 1: Configuration of Silhouette Soft 12 cone threads

Figure 2: Configuration of Silhouette Soft 12 cone threads

Number of cones in images do not represent the actual number of cones used

## Case study

### Patient A

Patient A is a 58-year-old female with an eight-year history of Bell's Palsy. She had developed sudden onset, complete right-sided idiopathic facial paralysis, which was diagnosed as Bell's Palsy following neurologist-led investigations. Patient A is in the minority of cases where the condition did not spontaneously resolve. Although she received supportive treatment, it was decided that she was not a candidate for surgical correction to improve the residual asymmetry, and had therefore been actively seeking non-surgical correction. Patient A was offered supportive treatment for her condition, which included eye drops and physiotherapy on behalf of the NHS. Surgical intervention was considered to carry too high a risk of bilateral manifestation of her palsy, thus she sought a non-surgical procedure to help correct her profound facial asymmetry.

### Presentation of Bell's Palsy

On inspection, Patient A had obvious facial asymmetry at rest. There was a question of contracture of the zygomaticus major and/or minor. This was associated with malar fat

atrophy, resulting in descended right cheek tissue and a deep right-sided nasolabial fold. Right-sided brow ptosis was present, including upper and lower lip asymmetry at rest. On examination, right-sided frontalis and depressor anguli oris activity was absent, with only weak orbicularis occuli and oris activity on maximal effort (House-Brackman V). Evidence of muscle synkinesis was present – when the patient closed her eyes, the right corner of her mouth pulled laterally with hyperactivity of the right belly of the mentalis. On her left unaffected side, inspection and examination revealed normal muscle activity, with normal facial ageing, resulting in facial fat pad atrophy with resultant tissue descent.

Patient A's concerns were predominantly cosmetic. They related to mid-face and lower-face asymmetries at rest. Mid-facial asymmetry was largely due to a profound right-sided nasolabial fold and volume depletion in the malar and lateral cheek area. It was felt that dermal filler treatment alone was not adequate to re-volumise the depletion and soften the nasolabial fold, therefore soft tissue transposition would form the cornerstone of correction. This would be achieved through non-surgical means as much as possible, using threads.

Brow ptosis, lip and chin-dimpling asymmetry was felt to be the result of both altered muscle activity and volume loss. Dermal fillers and targeted botulinum toxin injections would therefore comprise the treatment for these.

### The treatment process

I corresponded with Patient A's GP to confirm her diagnosis, discuss previous investigations, treatments and consultations from the relevant specialties (and to exclude any potential contraindications to treatment), as well as discuss the patient's wishes and my treatment plan for her. Patient A's treatment was carried out in three stages.



Before treatment

Two weeks after Silhouette Soft threads, dermal fillers and botulinum toxin treatment

Three months after Silhouette Soft threads, dermal fillers and botulinum toxin treatment

The first phase comprised the administration of botulinum toxin. This included injections into her left orbicularis oculi (below the right lateral eyebrow) to weaken any depressor function that was remaining to achieve some lift. Further injections were administered into the left depressor anguli oris to elevate the patient's left corner of her mouth. Finally, botulinum toxin was injected into her mentalis muscles bilaterally. Six threads (12 cone, three on each side) were sited in phase two of treatment (week one), in the directions illustrated in **Figures 1 and 2**. This procedure is not carried out sterile, and it does not require to be as it is a minimally invasive procedure siting a biodegradable, non-permanent device – however, 0.5% chlorhexidine gluconate was used for skin antisepsis, three times. The drapes, gloves, instrument pack and threads used were all opened sterile.

The products used are absorbable poly-lactic acid threads that are sited in the subcutaneous fatty tissue with small lactide-glycolide cones. The cones provide traction to soft tissue, allowing instant mechanical transposition of soft tissue in the sited vector. Twelve weeks after the treatment, thread resorption stimulates fibroblast activity, which results in collagenesis of structured Type I collagen, which, in turn, creates a biological lift. Once entry and exit holes of the threads had epithelialised, and any bruising had subsided, phase three (week two) of the treatment was carried out. This consisted of hyaluronic acid dermal filler treatment as follows:

- 0.5ml of a medium thickness dermal filler was sited with a cannula below the lateral aspect of the right eyebrow.
- 0.5ml of the same filler was sited into the left temple area (1cm above and 1cm lateral to the temporal ridge).
- 1ml of a soft, medium thickness filler was used to volumise

predominantly the left section of the upper and lower lips, redefine the 'cupid's bow' and achieve vertical projection.

- 1ml of a thick volumising filler was used to achieve greater symmetry as well as projection and elongation of the chin.
- 1ml of a very thin, soft filler was used to improve transition of the lid cheek junction bilaterally.
- Finally, 0.5ml of dermal filler was used to further soften the left nasolabial fold and 0.5ml was used in the left marionette line. At this point, Patient A was keen to undergo botulinum toxin injections in the glabella area, so this treatment was also carried out.

The final result after dermal filler treatment at week two and follow-up pictures at three months post procedure can be seen in **Figure 3**.

#### Post-procedure care

Patient A was followed up seven days after botulinum toxin treatment, four days after her thread treatment, and then weekly for a month following this. She was seen again in clinic three months following her initial treatment. Patient A will continue to be seen at six, nine and 12 months post-treatment. Post-procedure advice and care was given both verbally and in writing following treatment. This included strict instructions to avoid strenuous facial activity (e.g forceful chewing), as well as avoiding facial massage or sleeping on her side. Antibiotic ointment (Fucidin 2%) was given to Patient A to apply twice a day on entry and exit points of the threads for four days post procedure. Although there is little evidence that topical antibiotic application a number of days after treatment is of greater benefit than immediate post-treatment application on the first day, it was felt that this was appropriate in Patient A's case given the extent of treatment she underwent.

#### Conclusion

Bell's Palsy is an idiopathic facial paralysis that spontaneously resolves in the vast majority of cases. It can, however, be life altering to the few it persists, affecting patients' confidence and quality of life. Patient A was forced to take early retirement three years after onset as she became very self-conscious and aware of what she felt was a 'disfigurement'. The NHS offers many supportive treatments, and even surgical interventions to improve the cosmetic appearance of these patients, however, it is not always possible to offer all patients these procedures. In my experience, I have found that threads offering a mechanical lift are an effective way of addressing some of the soft tissue facial asymmetry, combined with dermal filler to restore volume in key areas, and, finally, targeted botulinum toxin to weaken depressor muscles and improve appearance. The threads used offer an instant mechanical lift and delayed biological lift. Patient A is not a typical candidate for thread treatment due to the extent of facial fatty tissue, however it was felt that with enough threads, vectored in a specific configuration, this treatment could provide her with a better result than she currently had, following the onset of her facial palsy.



**Dr Nestor Demosthenous** obtained his medical degree and BSc Hons Neuro from the University of Edinburgh in 2006. He has completed core surgical training followed by four years as a clinical fellow in Trauma and Orthopaedic Surgery. Dr Demosthenous is an experienced aesthetic practitioner and has completed advanced and masterclass training in aesthetic medicine.

#### Disclosure

Dr Demosthenous is a UK trainer for Silhouette Soft non-surgical facial thread lifting for Sinclair Pharma, and is the lead trainer in Scotland.

#### REFERENCES

1. Peitersen E, 'Bell's palsy: the spontaneous course of 2,500 peripheral facial nerve palsies of different etiologies', *Acta Otolaryngol Suppl*, (2002) pp. 4-30.
2. Peitersen E, 'The natural history of Bell's palsy', *Am J Otol*, 4(2) (1982) pp. 107-11.
3. Seiff SR, Chang J, 'Management of ophthalmic complications of facial nerve palsy', *Otolaryngol Clin North Am*, 25(3) (1992) pp. 669-90.
4. *Bell's Palsy: What is Bell's palsy* (UK: Facial Palsy, 2015) <<http://www.facialpalsy.org.uk/about-facial-palsy/causes-diagnoses/bells-palsy/37>>
5. Danette C, *Taylor Bells Palsy clinical presentation*, (Medscape, 2015) <<http://emedicine.medscape.com/article/1146903-clinical>>
6. Yen TL, Driscoll CL, 'Significance of House-Brackmann facial nerve grading global score in the setting of differential facial nerve function', *Otol Neurotol*, 24(1) (2003), pp. 118-22.
7. Sullivan FM, Swan IR, Donnan PT, Morrison JM, Smith BH, McKinstry B, 'Early treatment with prednisolone or acyclovir in Bell's palsy', *N Engl J Med*, 18. 357(16) (2007) pp. 1598-607.
8. *Bell's Palsy: Treatment* (NHS Choices, 2014) <<http://www.nhs.uk/Conditions/Bells-palsy/Pages/Treatment.aspx>> (accessed 21st May 2015)
9. Cardoso JR, Teixeira EC, Moreira MD, Fávoro FM, Fontes SV, Bulle de Oliveira AS, 'Effects of exercises on Bell's palsy: systematic review of randomized controlled trials', *Otol Neurotol*. Jun. 29(4) (2008), pp. 557-60.
10. Olver JM, 'Raising the suborbicularis oculi fat (SOOF): its role in chronic facial palsy', *Br J Ophthalmol*, 84(12) (2000) pp.1401-6.
11. *Facial Palsy: Surgery* (UK: British Association of Plastic Reconstructive and Aesthetic Surgeons, 2015) <[http://www.bapras.org.uk/public/patient-information/surgery-guides/facial-palsy#What surgery is available?](http://www.bapras.org.uk/public/patient-information/surgery-guides/facial-palsy#What%20surgery%20is%20available%3F)>