



Alignment is Everything

Marisol Chow finds out why far-sighted dentists are giving old-fashioned braces the boot, and also looks at how Botulinum Toxin A (BTA) works in dentistry.

The American Board of Cosmetic Surgery says Botulinum Toxin A (BTA) injections are by far the most popular cosmetic procedure in the United States. Despite treatments such as BTA, fillers and PRP (platelet-rich plasma) injections remaining prevalent and well-liked among medical aesthetic connoisseurs, most of us have only linked such procedures to facial rejuvenation and dynamic wrinkle reduction. While injectables are used to smooth facial lines and fill hollowness, did you know that BTA neurotoxin can also aid in dental-related issues such as headache eradication and even gummy smile reduction?

In this article, Consultant Orthodontist, Implantologist and Aesthetic Laser Dentist, Dato' Dr. How Kim Chuan explains how injectables can improve dental and facial aesthetics, as well as maintain balance and increase functionality. He also explained how Invisalign enhances facial features, and compares two orthodontic options to reveal why Invisalign remains the gold standard in the treatment of dental misalignment.

BTA IN DENTISTRY

WHY ARE INJECTABLES BEING INTRODUCED AT IMPERIAL DENTAL SPECIALIST CENTRE?

BTA and fillers are used for facial rejuvenation in aesthetic medicine. In dental practices they are used not only to improve looks, but to decrease pain in the facial muscles and joints as well. To better put this in perspective; let's take patients with heavy bite force as an example. In these cases, because the muscles are unusually powerful, the jaw will end up looking quite large; square and short. Aesthetics aside, functionality can also be impeded as heavy bite force and teeth clenching can lead to loose joints, joint pain and headaches. In such situations, BTA treatment can help decrease jaw size and improve facial aesthetics, as well as help patients regain comfort levels and dental performance. Dental patients who have undergone full mouth rehabilitation procedures such as implants and crowns can greatly benefit from additional injectable treatment. Because improved dental functionality through implants serve as foundational support while crowns and bridges provide structural support, collective building of the hard tissue will offer conducive soft tissue environments for BTA and fillers to further enhance facial aesthetics. Furthermore, although implants, crowns and bridges are able to improve facial imbalances by protruding the lips and elongating the jaw to produce fuller lips and fewer facial folds, further treatment with BTA and fillers can significantly increase the already improved results.

WHAT CAUSES HEAVY BITE FORCE AND HOW CAN BTA HELP?

Heavy bite force can stem from bruxism (teeth grinding), genetics and the facial form, or environmental causes like regularly eating crunchy and hard foods. If patients do not nip this habit in the bud, they will end up with A-shaped faces and loose joints. The masseter and temporalis are the two main jaw-clenching muscles and when patients bite down; the joints are squeezed and suffer heavy amounts of pressure. If the masseter and temporalis are always in a tense and contracted position, they naturally end up hypertrophic, or large. Furthermore, the joints can get loose which may possibly result in dislocation. With BTA, once the neurotoxin is injected into the muscles, bite force is reduced and facial joints will absorb less pressure. The jaw muscles are given breathing space, and with less muscle training, they will turn soft, and lose their muscularity. With continual treatment, the facial form will slowly transform from an A-shape to the coveted V-shape.

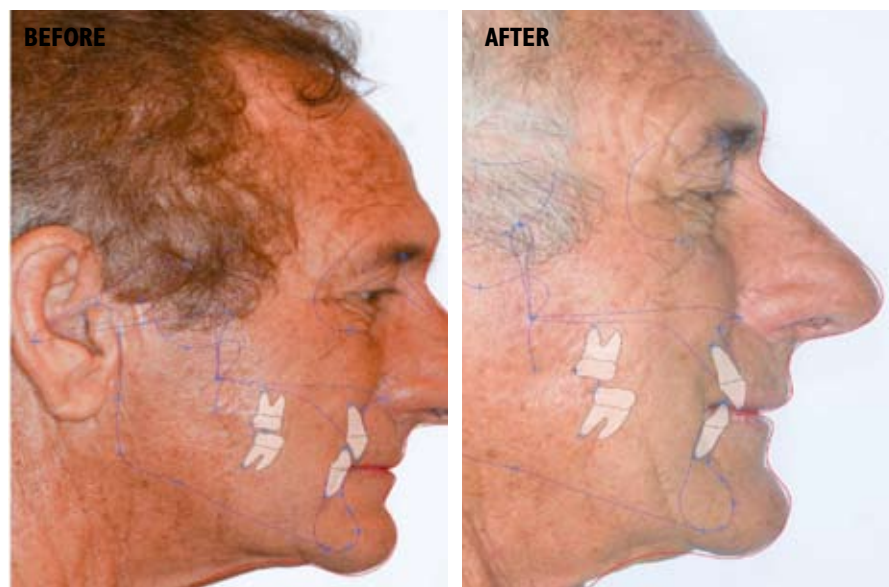
Along with hypertrophy, strong muscles and constant contractions can often lead to headaches. We can treat such problems by simply injecting BTA in the temporalis and hence, significantly reduce pain and improving function.

HOW CAN BTA TACKLE FACIAL IMBALANCES?

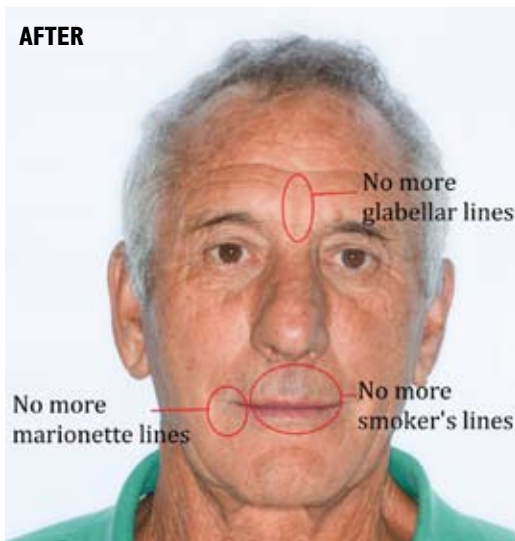
We have many facial muscles, and if there is one particular group of muscles that's primarily strong, other ones may sometimes be overshadowed and rendered insignificant. When patients undergo BTA and relax the predominantly tough muscles, the other muscles are given a chance to function, and this promotes symmetry and balance. Simultaneously, many people believe that



Consultant Orthodontist, Implantologist and Aesthetic Laser Dentist, Dato' Dr. How Kim Chuan from the Imperial Dental Specialist Centre.



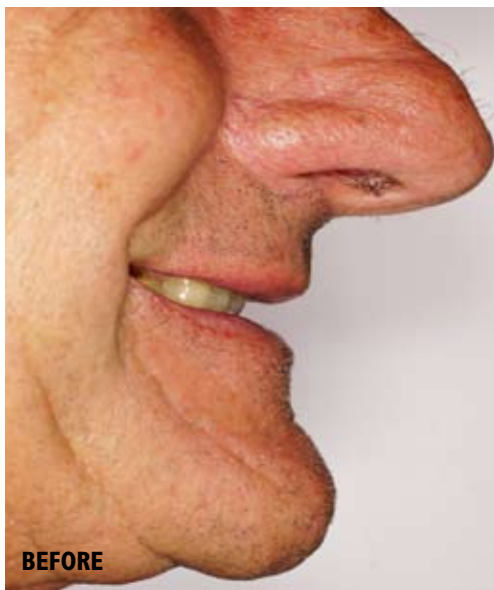
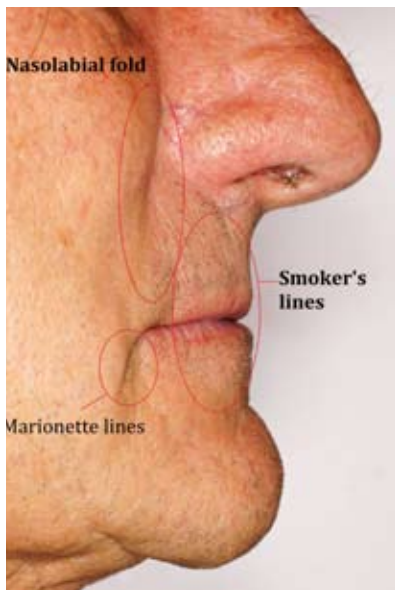
Patient has undergone full mouth rehabilitation of implants and crowns. The supported upper incisors now provide labial fullness to mimic a "filler effect" in the lips. From implants and crowns alone, the molars can now support vertical facial dimensions. This has lengthened the face to decrease facial folds to create a "BTA effect".



After BTA on the masseter, procerus muscle, orbicularis oculi, levator labii superioris. Patient has also undergone filler treatment for static line reduction.



Oral implants serve as foundational support while crowns and bridges serve as structural support. These treatments collectively build hard tissue to provide conducive soft tissue environments for further treatments of BTA and filler.



Smoker's lines, marionette lines and nasolabial fold are filled with hyauronic acid fillers.

BTA paralyzes muscles. It does not. BTA merely reduces its force while maintaining its purpose and objectives. For example, if patients would still like to eat certain hard foods, they can.

HOW MANY BTA TREATMENTS DO PATIENTS NEED?

The number of treatments will depend on diagnosis and severity. Each BTA treatment will normally last between four to six months and after that, a second session is in order. After time, although the effects of BTA have worn off, it

doesn't mean patients will immediately look like their old selves again. Instead, when patients opt for follow-up treatments, results are improved on, and with more sessions, the higher the likelihood of enhanced results. Furthermore, follow-up sessions will generally require lower dosages. For example, if a patient's first treatment necessitated 100 units of BTA, the second time round, they would probably only need 80. With two years of continual treatments, patients will find significant changes in the facial form. Although optimal results can be found after 24 months, this doesn't

mean that initial treatments won't produce noticeable outcomes. Patients will find considerable transformations two weeks after the first session.

With migraine treatment, if a patient requires 150 units of BTA, we will divide the dosages into two or three sessions. We may initially inject only 60 units during the first treatment, because under-injecting is always safer than over-injecting. Nonetheless, patients needn't be worried that dosages may be insufficient, as BTA has the ability to drastically reduce headaches two weeks after the first administration.

ALONG WITH THE TREATMENT OF SYMMETRY, SHAPE AND FUNCTIONALITY, WHAT OTHER BENEFITS DOES BTA OFFER AND HOW DOES IT GO HAND IN HAND WITH DERMAL FILLERS?

Apart from injecting BTA in the temporal and masseter muscles, we can treat other facial concerns such as dynamic wrinkles and fine lines. For example, we can erase crow's feet and treat a hyperactive mentalis, which causes protruded chins and dark shadows under the lip. Moreover, we can even use BTA to reduce gummy smiles. Through a combination of orthodontics and injectables, we can administer BTA in the levator labii superioris, which will stop the muscle from lifting too much when patients smile.

BTA is not a singular treatment but one that works hand in hand with fillers. Wrinkles are caused when muscles contract with high intensity. Despite BTA relaxing the muscles and making creases shallower, it doesn't have the ability to plump up those crevices. This is where fillers come in. Fillers are the perfect treatments for those with eye bags and deep creases such as nasolabial folds, marionette lines, smoker's lines and glabellar lines. There are two types of fillers. One is injected into the superficial layer, while the other is administered in the deeper regions of the skin. For example, if a patient has deep-set creases, we cannot inject superficially, but instead, will administer deep into the periosteum. This creates better, longer lasting results.

HOW CAN YOUNG PATIENTS BENEFIT FROM FILLER INJECTIONS?

With fillers we not only reduce folds but also intensify lip volume to improve gummy smiles. As dentists, we deal with teeth and lips on a daily basis and our oral and facial aesthetic understanding is not only reliable, but at an optimum level. From what I've seen, many doctors tend to over-inject the lips. This doesn't mesh well with the Asian aesthetic. As Asians, we prefer softer looks that are more delicate and feminine. Although we do increase the lip volume, we do not exaggerate its effects but instead opt for subtle changes that are gentle, and yet pleasing to the Asian eye.

WHAT COMES FIRST, BTA OR FILLERS?

In my opinion, patients should opt for BTA first, allow its effects to kick in and later, have fillers administered. At the same time, there are others who choose to undergo fillers before BTA. This happens because creases such as nasolabial folds, marionette and smokers lines can be severe and patients would prefer to have those lines plumped up followed by BTA. If aged patients suffer from deep folds and weak muscles, fillers without BTA is possible especially if they have additional budget constraints.

Diagnosis is important, and despite dentists mainly treating teeth and gums, we are well trained in the anatomy of the face and head and are able to appreciate oral and facial

aesthetics. Moreover, dentists have the ability to take small details into consideration with an emphasis on symmetry and balance. If, for example, a patient has a disproportionate face, with one side droopier than the other, we will not administer the same dosage on both sides, but instead use a technique called micro adjustments where we titrate or divide injectable units into separate sessions and add supplementary fillers to achieve the most symmetrical result.

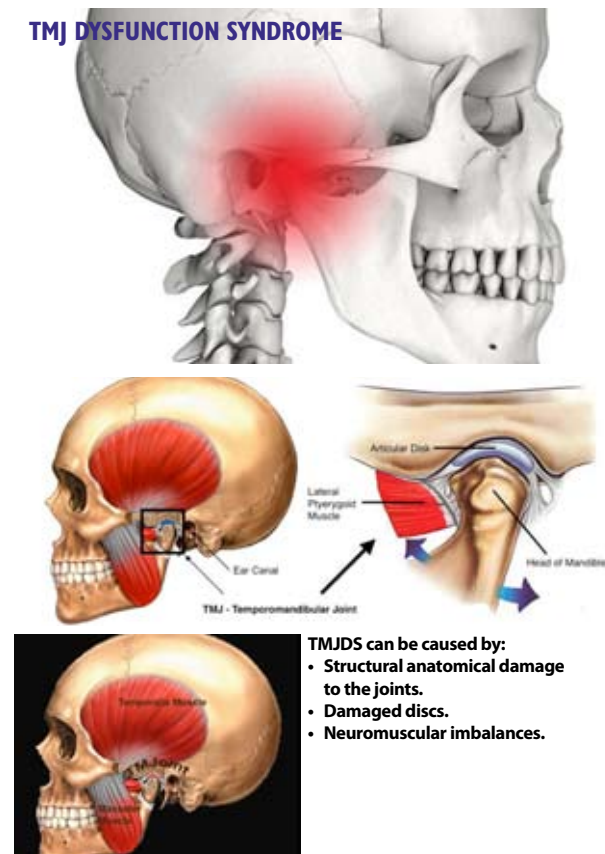
WHAT ABOUT PRP (PLATELET RICH PLASMA)?

At Imperial Dental Specialist Centre, we use PRP to treat eye bags and cheeks. The difference between fillers and PRP is its ingredients. Fillers are made from hyaluronic acid. While it is an all-natural product, and while hyaluronic acid does plump sunken zones, it will dissolve over time.

On the other hand, PRP is derived from blood plasma that contains growth factors and other cytokines, which has the ability to promote collagen and elastin regeneration. As patients age, skin loses its turgor because of depleted collagen. If we were to treat loose skin solely with fillers, patients may end up looking stiff and unnatural. With PRP, once the body has undergone regeneration and improved muscle tone, we can inject fillers to further smoothen out hollow or depressed areas.

PRP results can be seen as early as two weeks post-treatment, but full collagen regeneration will be found two months post-treatment. Patients can opt for PRP without fillers, but the disadvantage is that regeneration is not 100 percent and cannot offer optimal aesthetic results. If patients request for only PRP, we can administer PRP first and see how much natural regeneration is produced. If the patient shows good results and doesn't require fillers, great; but depending on severity, he or she must remember that further enhancements may be necessary.

TMJ DYSFUNCTION SYNDROME



- TMJDS can be caused by:**
- Structural anatomical damage to the joints.
 - Damaged discs.
 - Neuromuscular imbalances.

Pictures courtesy of Dato' Dr. How Kim Chuan.

BEYOND BRACES

VISIBLE DIFFERENCE WITH INVISALIGN

Does a mouthful of heavy metal do a better job of correcting orthodontic irregularities than barely-there braces like Invisalign? Can something so subtle-looking truly cope with severe dental misalignments? With Imperial Dental Specialist Centre being awarded Platinum status for successfully performing a large number of Invisalign cases, Dato' Dr. How believes Invisalign can not only align the teeth and produce a stunning smile line, but also enhance facial features and improve contours. He also considers Invisalign to be far superior to traditional orthodontics and believes conventional braces made of brackets and wires will eventually be a thing of the past.

HOW DOES INVISALIGN IMPROVE FACIAL POINTS AND CONTOURS?

Along with a straighter smile, Invisalign has the ability to improve facial aesthetics by enhancing points such as the nose, lips, chin and jaw. From the included before and after photos, readers can see that this patient gained a higher nose bridge and a more refined and sharper tip. Moreover, the nasolabial fold has significantly reduced and her jaw and chin have undergone significant modification by becoming much slendrer and contoured. Last but not least, the patient's lip width has also reduced and now sports a more feminine pout. If readers are wondering how Invisalign can additionally enhance facial points and contours, it's actually based on one reason. Because Invisalign's main purpose is to move hard tissue and induce dental contracture, the soft tissue such as the cheeks, nose and lips will have no choice but follow suit and move inward as well. As such, patients undergoing Invisalign will not only enjoy beautifully aligned teeth, facial aesthetics will also be improved without the need for surgery or injectables.

HOW DOES INVISALIGN'S COMPUTER-GENERATED TECHNOLOGY FARE AGAINST CONVENTIONAL BRACES?

Invisalign uses 3D CAD/CAM technology or precision 3D control. Computer generated engineering tracks precise dental movements - as little as one degree and 0.2 millimetres. Conventional braces with wires and brackets, however, will not



After treatment, soft tissues such as the nose has moved both downwards and upwards to produce a more pronounced tip. The nasolabial fold has decreased and the lip width has reduced with the top labial pointing outwards to produce a more attractive pout. Lastly, the chin protrudes forward to bring out a defined jawline.

be able to produce these results. Therefore, Invisalign remains the gold standard in orthodontic treatment and if patients want smiles that are not only beautiful but also functional, Invisalign is an excellent choice.

There are instances where conventional braces are the preferred option and this is when patients suffer severe crowding. Because the wires are weaved through the brackets, alignments can be much faster. Despite this fact, it doesn't mean that Invisalign cannot produce the same outcomes. Although conventional braces may offer quicker treatments, Invisalign will yield similar outcomes but at a slower pace.

Furthermore, with a precision control of one degree and 0.2 millimetres, Invisalign doesn't require staging. With conventional braces, teeth movement will go through clinical stages and is forced to follow a certain order. The first stage is called alignment and leveraging. The second stage is overbite and overjet reduction and only in the last stages can we close spaces and move forward with final corrections. Invisalign, on the other hand, does not require staging because it doesn't have brackets and wires. Invisalign has the ability to correct stage one problems and immediately close spaces too. With 3D technology, conventional staging is eradicated and this can produce fast and comfortable results.

Pictures courtesy of Dato' Dr. How Kim Chuan.



After Invisalign, crowding was eradicated, alignment was corrected and equal distance from left and right teeth was achieved without deviation from the midline.



BEFORE



AFTER

Zero crowding, optimal dental alignment and corrected midline after Invisalign.



BEFORE



AFTER

No more crowding, corrected midline deviation and optimal bite after Invisalign.

HOW DO CONVENTIONAL BRACES DAMAGE THE ORAL CAVITY?

Because Invisalign delivers changes as little as 0.2 millimetres at a time, patients will hardly feel any pain. With conventional braces, movement activation can be as large as one centimetre and while results are produced much faster, patients do suffer severe discomfort, not only from tooth movement, but ulcers from metal wires as well.

When we speak of damage to the oral cavity, braces could damage roots, gums and the underlying bone structures. I have seen cases where patients have ended up with bleeding gums and bone recession stemming from the metal's strong force. Invisalign's aligners have always maintained low intensities that are gentle, effective and without painful mutilation. Many believe that with stronger force comes better results. That is completely wrong. In my professional opinion, slow and steady wins the race, and with gentle strength, Invisalign is not only kind to underlying structures but in the long run, effective as well.

ALONG WITH PAIN AND DAMAGE, WHAT OTHER DISADVANTAGES ARE RELATED TO CONVENTIONAL BRACES?

A further disadvantage is its inability to treat asymmetry or canted smiles. Botox and fillers will not be able to treat such imbalances because the problem lies in teeth and bones as opposed to the soft tissue. If patients choose to treat this problem, it will have to be via orthodontics. With Invisalign, we can correct the asymmetry and balance out the hard tissue. Once the teeth and bones are leveled, the soft tissue will follow suit and yield equilibrium of at least 75 percent. If patients desire further improved results, they can always opt for injectables such as Botox and fillers.



BEFORE



AFTER

After Invisalign, patient's facial contours are much sharper and more defined to promote an enhanced facial aesthetic. The lips have become smaller and shapelier and brings about a more attractive pout.



Dental crowding is eradicated, optimal alignment and bite are achieved and midline is corrected after Invisalign.

In my opinion, conventional braces will slowly be phased out because they do not have precision control and are very painful. Last but not least, they are aesthetically unappealing and affect oral hygiene because spaces between the wires and brackets are difficult to clean. Likewise, these braces cause permanent stains from poor brushing. With Invisalign, the trays are nearly invisible and removable. Because of their removability, patients are able to not only able to maintain good oral hygiene but are also allowed eat anything they want.