

Botox[®] with *Implants*

NEW Regular Feature

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Botulinum Toxin type A (BoNT-A) has been used extensively cosmetically treating facial lines & therapeutically for hyper contraction associated with Distonias, bruxing & clenching.

Although there are numerous articles in the literature documenting the therapeutic use in hyper muscular contraction, the current literature is extremely scarce specifically relating to muscular relaxation for improved tissue healing and outcomes in combination with surgical procedures.

This paper describes the use of BoNT-A prior to surgical regeneration of osseous tissue prior to placement of titanium implants. Two contrasting case studies are presented: one with pre surgical placement of BoNT-A prior to bone regeneration and the other without BoNT-A.

Conclusion: The pre-surgical placement of BoNT-A enhances the bone regeneration when precisely placed to relax the adjacent musculature.

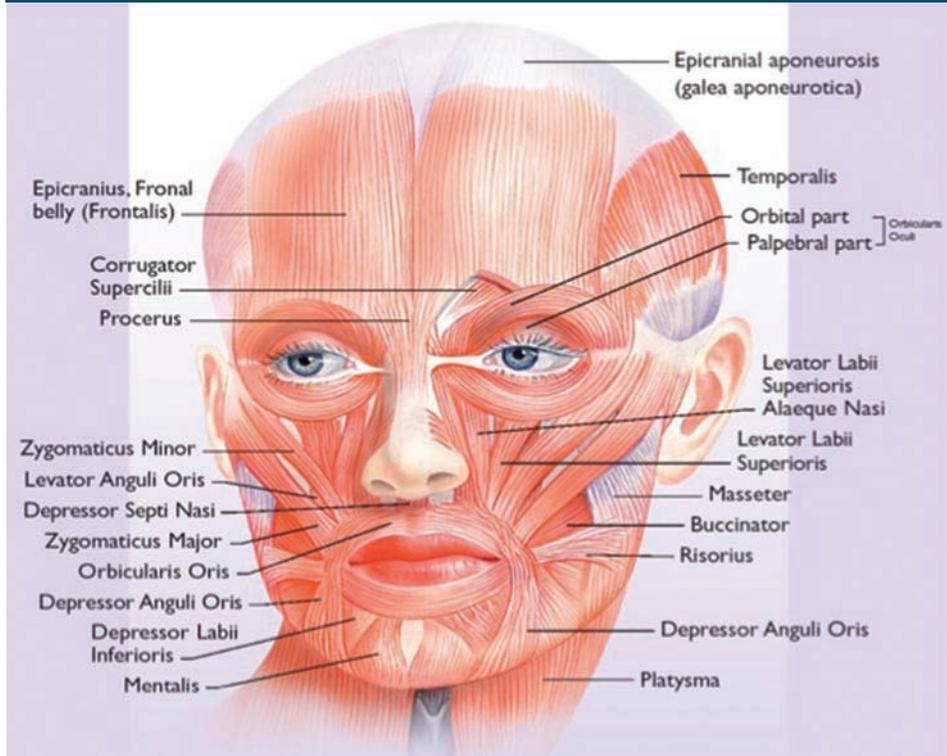
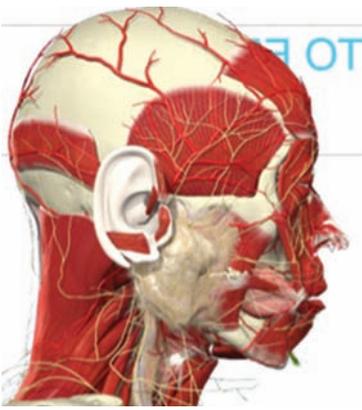


Fig. 1: Muscles of the face

I recall my first course on titanium implants in the early 1980's. At that time integrating implants into your practice was challenging. It was an extremely new concept for many dentists, teams and patients. I recall contacting our governing body and asking what the dental billing code was for this new treatment modality. The reply was I should stay with the then current stainless steel staples! (There are probably young dentists around today who have not even heard of these crude forerunners!) Those that resisted the new implant paradigm got left behind.

In the early 1980's the treatment options for an extracted or missing tooth (in order of use), were a flipper partial, cast partial or a fixed bridge. Today, the treatment of choice is usually the titanium implant. The initial treatment regimen of three



Figs. 2a and 2b: Mentalis muscle

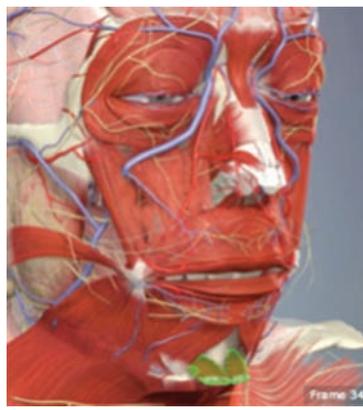


Fig. 3: Depressor Labii Inferioris muscle

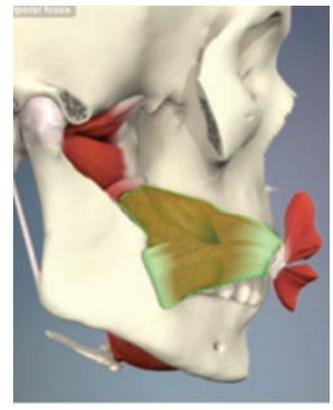


Fig. 4: Buccinator muscle

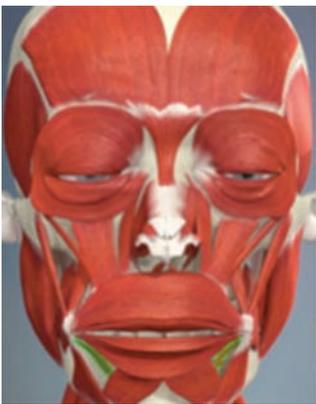


Fig. 5: Incisivus Labii Inferioris muscle

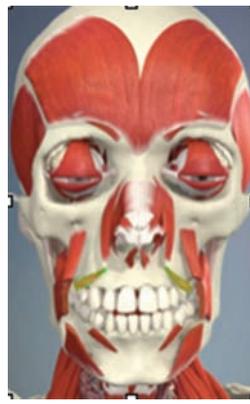


Fig. 6: Incisivus Labii Superioris muscle

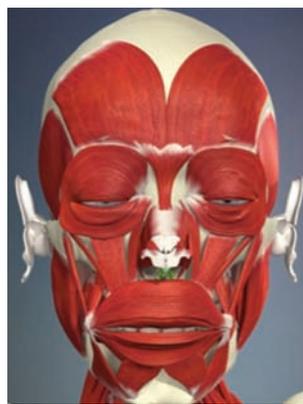


Fig. 7: Depressor Septi Nasi arises from the incisor region of the Maxilla



Fig. 8: The attachment of Mentalis in a normal Mandibular ridge

months buried has moved to immediate placement and loading in many cases. What a change!

Originally, we were limited in the positioning and placement of these new implants by the angulation and amount of the existing bone. Practitioners began transplanting autogenous bone from one area of the patient to another. Gradually innovation has resulted in the development of procedures, products and refined autogenous materials to regenerate the alveolar ridges in 3D. We can use remineralized / demineralized bone, BMP, BBD, PPP, collagen membrane etc. It is difficult to imagine what discoveries, techniques, technology and innovation will be next.

Still with all of our new technologies and materials, there is often loss of regenerated bone. Sometimes we forget the basics. In the battle between muscle, bone, TMJ and teeth.....muscle always wins. We must be thinking of the anatomy (Fig. 1) and look at the muscle attachments in the area where we are planning the osseous regeneration. To aid in the explanation, I will use a few of the diagrams we utilize at the Pacific Training Institute for Facial Rejuvenation. In the anatomy lab section of our Level 1 Botox course, the

locations of the following muscles are discussed in e-skull, e-cadaver and the hands-on cadaver lab:

- Mentalis (Fig. 2a & 2b)
- Depressor Labii Inferioris (Fig. 3)
- Buccinator (Fig. 4)
- Incisivus Labii Inferioris (Fig. 5) & Superioris (Fig.6)
- Depressor Septi Nasi (Fig. 7)

In a healthy mandibular and maxillary alveolar ridge, the tooth is surrounded by alveolar bone (Fig. 8 & 9). When a single tooth is lost, in the absence of periodontal disease, there is normally adequate bone to place a single implant.

In a situation where there has been both vertical and labial / lingual bone loss, the alveolar ridge is lost and often there is inadequate bone to support a denture, let alone an implant (Fig. 10a, 10b, 10c). Today there are new techniques to analyze the areas that require bone re-generation. With cone beam technology (Fig. 11) we can not only envision the bony architecture but design the insertion pathways with precision.

However, in the reduced ridge, the insertion of the muscles

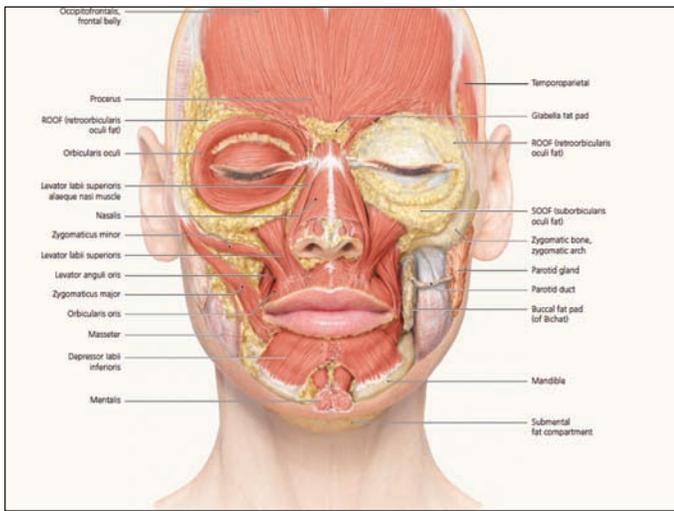


Fig. 9: Origin of Mentalis in a normal Mandibular ridge

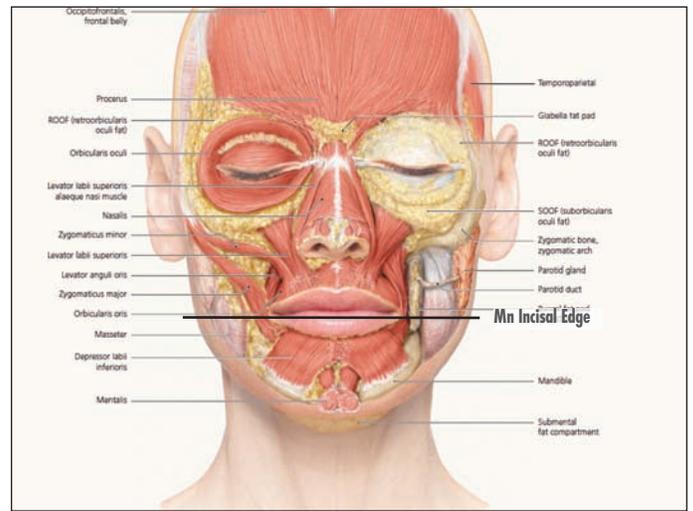


Fig. 10a: Mandibular Incisal Position

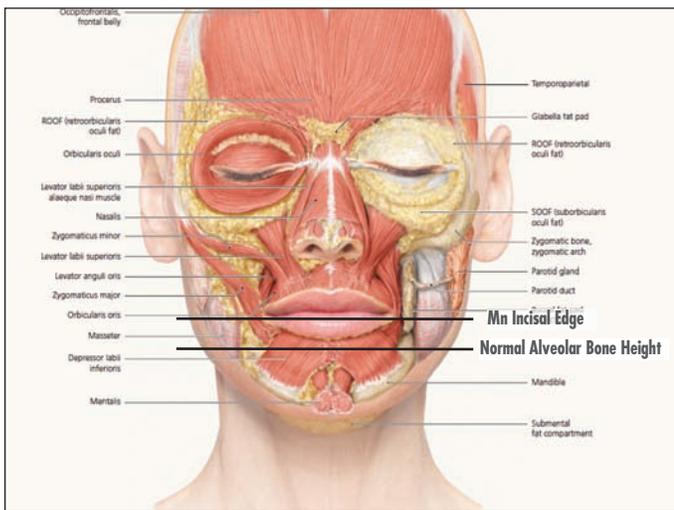


Fig. 10b: Normal alveolar bone height

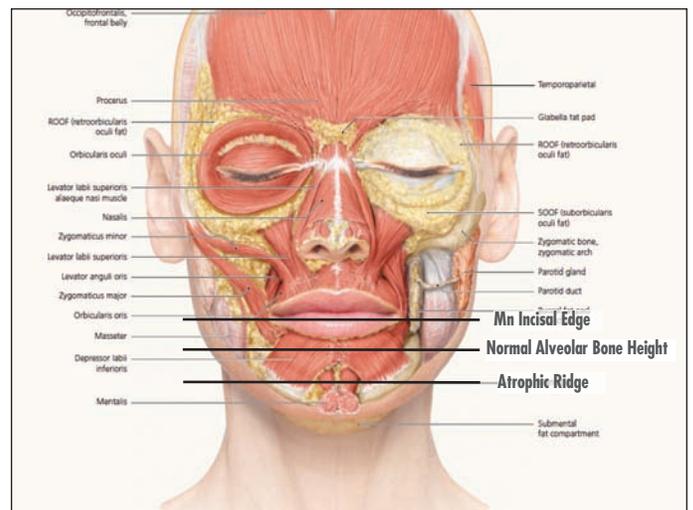


Fig. 10c: Mandibular atrophic ridge height

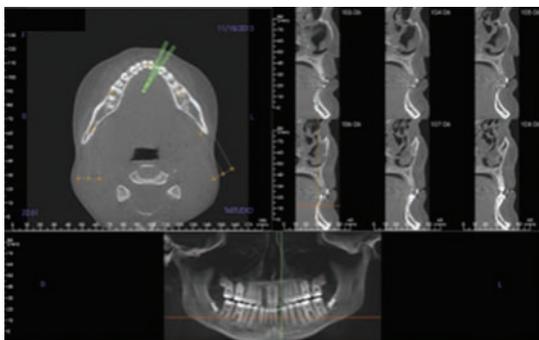


Fig. 11: Cone beam technology aids in proper diagnosis, regenerating bone position & implant placement



Fig. 12a: The mentalis muscle attachment in the atrophic Mandibular ridge is on the crest of the bone



Fig. 12b: The superior portion of Mentalis is on the crest of the Mandibular ridge & the more inferior portions blend into the surface epithelium

of facial expression are now located on or near the crest of the reduced mandibular ridge (Fig. 10c, 12a & 12b). During the surgical procedure, after the incision, the soft tissue which includes the muscles is reflected. Bone regenerating materials are placed. There may be a collagen membrane placed and usually the soft tissue is brought back over the regenerating materials and sutured into place. In the healing phase the

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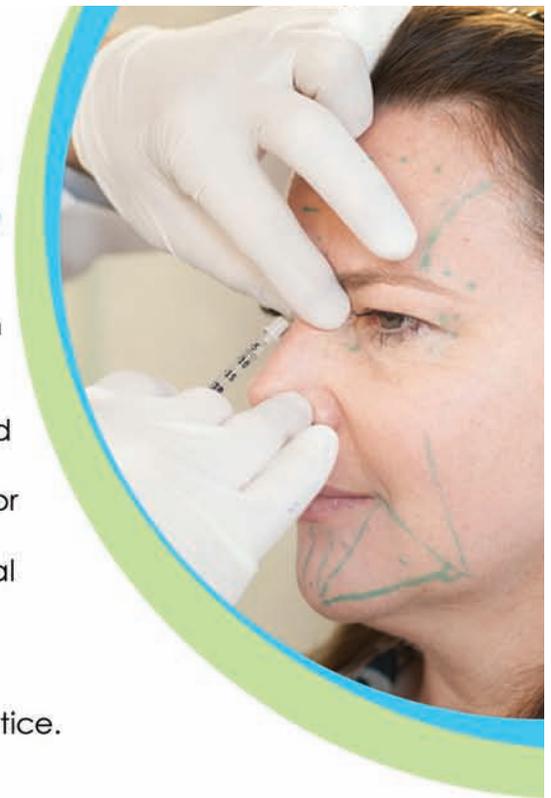
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Dr. Warren Roberts is a leading Botox[®] educator whose Vancouver clinic is the number one administrator of Botox[®] across North American dental practices. Since 2008, he has trained over 7,000 doctors nationally and internationally, and has treated hundreds of Botox[®] patients.



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periosteum binds to the immature bone. In this process, there is also muscle reattachment onto the newly placed regenerating material. This muscle reattachment can harm the immature bone.

The primary mechanism of action of botulinum toxin decreases the vesicle release of Acetylcholine (ACH) at the motor nerve axon ending (Fig. 13a & 13b). This action of BoNT-A, temporarily prevents ACH passing into the nerve muscle synapse and thus decreases the ability of the muscle to contract. BoNT-A placed strategically into the selected muscles, will reduce the muscular pull in the area of regenerating bone. Proper diagnosis and placement of BoNT-A to relax the musculature minimally two weeks prior to the surgical procedure, will allow the new regenerating bone to mature unimpeded by the pulling action of the muscles. The effect of botulinum toxin begins to decrease after three months. Repeated injections of BoNT-

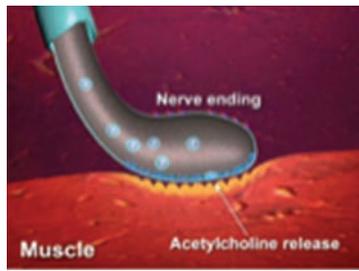


Fig. 13a: Motor nerve axon muscle synapse

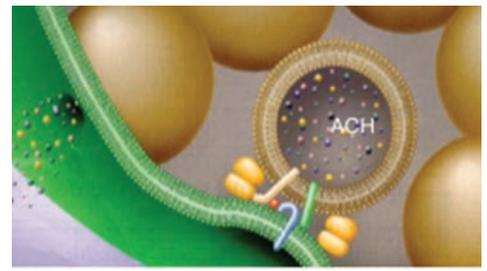


Fig. 13b: The primary mechanism of action of BoNT-A acts on the motor nerve axon, preventing the vesicle release containing ACH

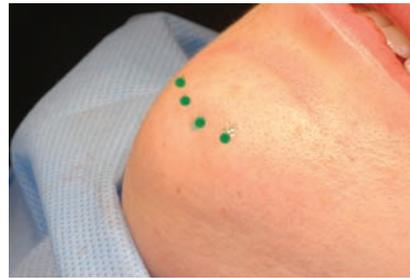


Fig. 14a: Tissue marked for BoNT-A injections for relaxation of Mentalis



Fig. 14b: BoNT-A injections

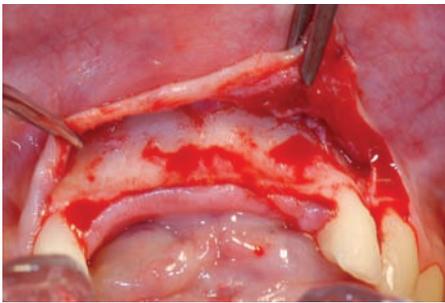


Fig. 15: Soft tissue reflected with BoNT-A administered 2 weeks prior

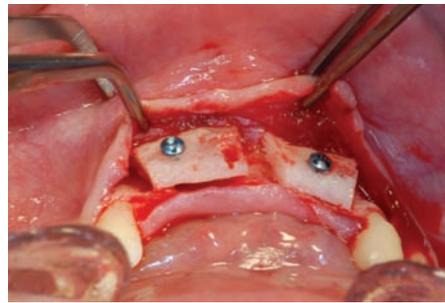


Fig. 16: Ramus sections fitted with BoNT-A administered 2 weeks prior



Fig. 17: Collagen membrane in position with BoNT-A administered 2 weeks prior



Fig. 18: Soft tissue sutured with BoNT-A administered 2 weeks prior



Fig. 19: BoNT-A pretreatment 3 week post-op



Fig. 20: 3 weeks post-op no BoNT-A

A should be performed at three month intervals to maintain muscle relaxation.

This article presents two cases, where anterior Mandibular bone regenerating procedures are required prior to implant placement. The surgical procedures in both these cases were performed by Dr. Kevin Lung, Oral Maxillofacial surgeon in Edmonton, Alberta. Our thanks to Dr. Lung for providing the

photographs of the surgical procedures and their outcomes.

In the first case (fig. 14-19) the musculature, adjacent to the surgical site has been treated with botulinum toxin two weeks prior (Fig 14a & 14b). The bone has been harvested from the Ramus. The soft tissue was reflected (Fig 15), the bone segment fitted (Fig 16) and held by two retention pins, a collagen membrane positioned (Fig 17) and sutures placed (Fig 18). At

three weeks post-op the entire Ramus section is still intact (Fig. 19).

In the second case the same surgical protocol was followed; bone segments were harvested from the Ramus, soft tissue was reflected and the harvested section fitted into position and held by two retention pins. A collagen membrane was placed. At three weeks post-op (Fig. 20) there has been considerable loss of the Ramus section. The retention pins are pushing through the soft tissue with no supporting hard tissue remaining (Fig. 21 & 22)

Outcomes from the two surgeries contrasting no BoNT-A on the left and the pre treatment with BoNT-A on the right (Fig. 23a & 23b).

Each regenerating material combination will vary in maturation time, often a minimum of one year. BoNT-A is a valuable adjunct in stabilizing the environment for immature bone. This is an area that requires more research. If you are interested in participating in a multi site research project for botulinum use with implants, please contact us at 604-681-0066. ■



Fig. 21: 3 weeks post-op no BoNT-A



Fig. 22: 3 weeks post-op no BoNT-A



Fig. 23a: BoNT-A pretreatment 3 week post-op



Fig. 23b: 3 weeks post-op no BoNT-A

Drs. Warren & Janet Roberts
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Dr. Warren Roberts is the Clinical Director for the Pacific Training Institute for Facial Aesthetics (PTIFA) and is a leading Botox educator whose Vancouver clinic is the #1 administrator of Botox across North America dental practices. He is the developer of the Roberts Facial Rejuvenation Photography series, the PTIFA Cosmetic & Therapeutic Marking Templates, the

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Dr. Jan Roberts is the Senior Clinical Instructor for PTIFA and is also a Clinical Director for the Frontier Institute. She is in the final stages of her AACD accreditation - the world's most recognized advanced credential program. Currently, she is the leading voice on how the combination of cosmetic dentistry and facial rejuvenation treatments can work together to push patient satisfaction to the next level. Through her work with PTIFA and Dr. Warren Roberts - she is creating a new understanding of how doctors can achieve better outcomes in therapeutic and cosmetic cases with the two disciplines working together. She can be reached at drjan@asmileabove.ca or 1-855-681-0066

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