

# ACCELERATED ORTHODONTICS WITH ALVEOCENTESIS

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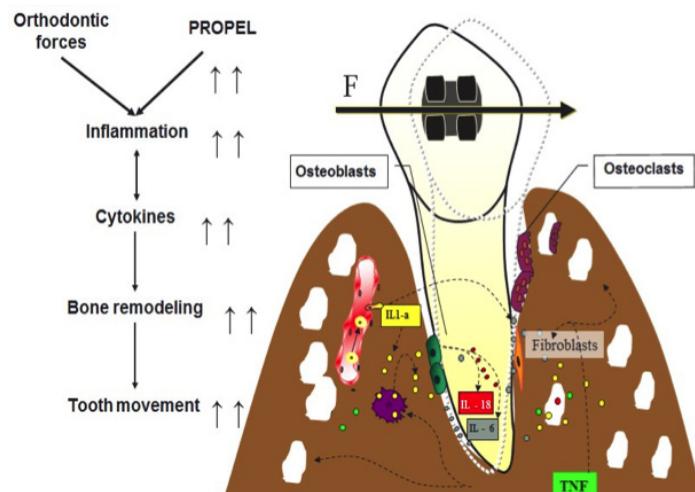
**ABSTRACT:** A new micro-invasive technique called Alveocentesis™ developed by university researchers uses the PROPEL® System, an instrument developed by PROPEL Orthodontics, to stimulate cytokine activity thereby, accelerating alveolar bone remodeling. The result is a 50-60% faster movement when compared to traditional orthodontics alone. PROPEL can be completed chair-side in minutes and does not require any advanced surgical training. Additionally, the Alveocentesis procedure yields very little discomfort to the patient. There is zero recovery time and the patients are able to immediately return to their normal daily routine. The procedure is indicated for approximately 80% of patients receiving orthodontic treatment and can be used in conjunction with any treatment modality including but not limited to TADs, Invisalign®, Sure Smile®, and conventional braces. Unlike other systems, PROPEL is unique in that it can be targeted to specific teeth or quadrants rather than applied to the whole dentition at once in an uncontrolled fashion that may lead to anchorage issues or loose teeth at the conclusion of treatment.

**KEYWORDS:** Alveocentesis, micro-osteoperforations, bone remodeling, accelerated orthodontics, PROPEL, cytokine expression

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Patients' number one concern before starting orthodontic treatment is how long treatment will take. In the past 20 years, new devices and modalities have made the orthodontic process more efficient, but not faster. Many innovations have been introduced to improve bracket design and treatment protocols, however the only effective techniques to increase the speed in which teeth move through alveolar bone involve extensive surgery. The challenge has been how to locally accelerate bone remodeling in a non-invasive manner.

Teixeira et al. has shown that by applying our understanding of tooth movement physiology, we can accelerate bone remodeling using micro-osteoperforations. In particular, by increasing the local levels of cytokine activity around a tooth, the rate of tooth movement during orthodontic therapy can be increased.<sup>1</sup> Increased cytokine activity has been well documented to increase bone remodeling. In animal studies,<sup>1</sup> when micro-osteoperforations were created in the alveolar bone, the cytokine cascade is activated resulting in a marked increase in osteoclast activity. When orthodontic force is applied immediately following micro-osteoperforation, the teeth will move faster and easier through the treated area.<sup>2</sup>

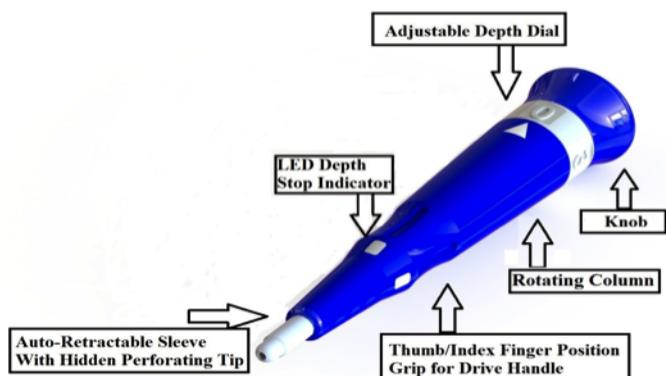


A new micro-invasive technique called Alveocentesis™ stimulates cytokine activity thereby, accelerating alveolar bone remodeling. This new technique called the PROPEL System has been developed and patented for use as a simple, in-office procedure to stimulate alveolar bone remodeling.

## ALVEOCENTESIS USING PROPEL

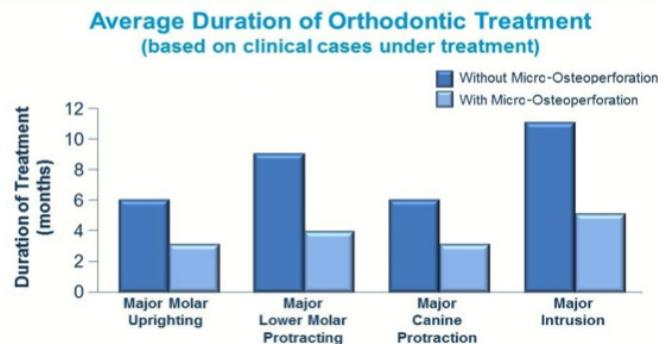
Alveocentesis, performed using the PROPEL® System, is the only micro-invasive option able to accelerate orthodontics. The result is a 50- 60% faster

movement than traditional orthodontics alone. PROPEL can be completed chair-side in minutes and does not require any advanced training; therefore, it can be performed by any clinician. Additionally, the Alveocentesis procedure yields very little discomfort to the patient. There is zero recovery time and the patients are able to return to their normal daily routine immediately. The procedure is indicated for approximately 80% of patients receiving orthodontic treatment and can be used in conjunction with any treatment modality including but not limited to TADs, Invisalign®, SureSmile®, and conventional braces. Unlike other systems, PROPEL is unique in that it can be targeted to specific teeth or quadrants rather than applied to the whole dentition at once in an uncontrolled fashion that may lead to anchorage issues or loose teeth at the conclusion of treatment.



PROPEL is a breakthrough in dental device engineering. The patented PROPEL System was designed and developed specifically to maximize the alveolar bone remodeling effect while providing a safe and simple device that can be used by any clinician. The treatment edge of the PROPEL device is made of hardened stainless steel and designed to protect the integrity of the bone. PROPEL maintains its sharpness when treating an entire dentition because of an organic electropolishing process<sup>4</sup>. PROPEL profoundly diminishes the effect on soft tissue, in contrast to other currently available rotary instruments.

### Micro-Osteoperforation Clinical Data (First 30 patients)



Duration of treatment was reduced by approximately 50% with Osteoperforation

The flutes of the leading edge are at a 30 degree angle to reduce soft tissue resistance and simultaneously provide the clinician with an ergonomic design.

A study at New York University, Department of Orthodontics was conducted with first generation devices that demonstrated an increase in tooth movement by 50-60% or more.

Today, an increasing number of adults are seeking orthodontic treatment to enhance the social, psychological and functional status of their lives. Treatment of these patients is complicated by the fact that the correction of their malocclusion is limited to the dento-alveolar element, since adult patients are no longer growing. With an increase in age, tissues are less biologically active and the ability to adapt diminishes. As a result, tooth movement may not only be more uncomfortable for adults but also occur at a slower rate.

Previous animal studies demonstrate that by delivering Alveocentesis in the bone near the teeth, bone remodeling enables a greater rate of tooth movement.<sup>3</sup> Based on the referenced animal studies, it was demonstrated that the usual highly invasive surgical procedures can be simplified and replaced with minimal, shallow, small micro-osteoperforations in alveolar bone without the need for soft tissue flaps, bone grafting or any suturing.<sup>3</sup>

As with any medical intervention, the longer any orthodontic treatment takes, the higher the possibility for side effects and poor outcomes. By shortening treatment time with PROPEL, patients avoid the pervasive complications of long-term orthodontic treatment. There is less likelihood for decalcifications and root blunting with shorter treatment times<sup>6</sup>.

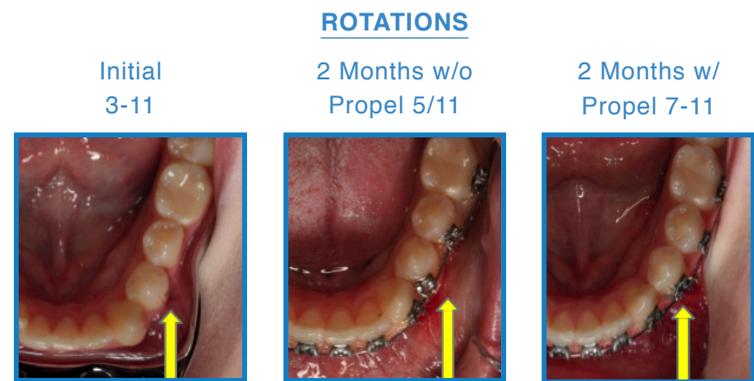
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## ABOUT THE AUTHOR

Jonathan Nicozisis, DMD, MS, has been in the specialty practice of orthodontics since 1999 in Princeton, NJ. He completed his dental education at the University of Pennsylvania before attending Temple University for his orthodontic residency. Dr. Nicozisis is a member of the Angle Society and Invisalign® National Speaker's Bureau and Clinical Research Network. He is also the founding orthodontist and former scientific advisory board member of BAS Medical (now Corthera), a development stage company founded in 2003 with a mission to develop and market a novel technology to accelerate and improve the stability of orthodontic treatments. Dr. Nicozisis' master's research on the use of the hormone Relaxin as a therapeutic adjunct was the basis for BAS Medical's innovative research. In February of 2010, Corthera was acquired by Novartis. Dr. Nicozisis is also on the Scientific Advisory Board of PROPEL Orthodontics, a start-up company developing novel technologies to facilitate tooth movement. Most recently has been named as a consultant to Smile Assist.

## CLINICAL EXAMPLES OF PROPEL



LL 4 & 5 were treated for eight weeks without PROPEL with little correction. PROPEL was performed and correction was completed in eight weeks.

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