Accelerated Orthodontics

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Micro-osteoperforation (MOP) is a micro-invasive technique that has been introduced to accelerate orthodontic treatment by stimulating bone remodeling. This procedure involves creating small perforations in the alveolar bone, which induces a cytokine cascade. This cascade significantly increase osteoclast activity, leading to faster tooth movement without the need for extensive surgical intervention.

The process of MOP is simple and can be performed in-office by an orthodontist. Interceptive orthodontics can guide facial and jaw development **Children's braces treatment** dentistry. It typically involves a consultation to select the areas where microosteoperforations are necessary, followed by the procedure, which involves local anesthetic to numb the gum tissue. A small handpiece is then used to create the micro perforations in the bone. The procedure is completed within 10 to 20 minutes and results in minimal discomfort, with no recovery time necessary.

MOP can be used in conjunction with any orthodontic treatment modality, including braces, Invisalign, and other aligner treatments. It is indicated for approximately 80% of patients receiving orthodontic treatment and is especially effective in cases where teeth are difficult to move, as it can significantly shorten treatment duration. This is a significant advantage for adults and teens with busy schedules, as it allows them to achieve their desired orthodontic results more quickly.

The biological principles that MOP harnesses involve the induction of a favorable inflammatory response, which stimulates the bone around the teeth to increase tooth movement. By accelerating bone remodeling, MOP reduces the time it takes to achieve orthodontic results, which in return reduces the likelihood of side effects and poor treatment results that can be more significant with longer treatment times. This technique has been scientifically proven through university studies and clinical trials to be both effective and efficient in accelerating orthodontic treatment.

Micro-osteoperforation (MOP) has been a significant step in the field of orthodontics, especially when it concerns reducing treatment time and increasing patient satisfaction. This technique involves making small perforations in the gums and bone around the teeth to accelerate bone remodeling, which in effect, allows teeth to move more efficiently during orthodontic treatment. The advantages of MOP are multiple and highly appealing, especially for kids undergoing orthodontic treatment. **1.** One of the most significant benefits of MOP is the reduced treatment time. By accelerating bone remodeling, MOP can decrease the duration of orthodontic treatment by up to 50% compared to traditional methods. This is a significant advantage for kids, as it reduces the time they have to be in braces or use other orthodontic devices, which can be a long and often difficult process for them.

2. MOP is also noted for causing minimal discomfort to the patient. The procedure is minimally invasive and typically requires only minimal anesthetic. This is a significant advantage for kids, as it reduces their pain and discomfort during the treatment process. Additionally, the procedure is barely visible after it is performed, and the perforations are not visible at all after a day, which can be a significant concern for many patients.

3. There is zero recovery time after MOP, allowing patients to immediately return to their normal daily routine. This is especially important for kids, as it minimally impa
4. MOP can be used in conjunction with any treatment modality, including conventional braces or Invisalign, making it highly effective and efficient for a diverse group of patients. Its ability to be performed chairside by any trained clinician without the need for extensive surgical training or recovery time is another significant advantage.

In terms of its effects on treatment, MOP has been shown to increase the rate of tooth movement significantly, making it an effective method for accelerating orthodontic treatment. While there are some potential side effects, such as increased root resorption in some cases, the benefits often far

out

5. MOP also helps in reducing the complications of long-term orthodontic treatment, such as stains on the teeth and damage to the roots of the teeth. By shortening the treatment time, patients can return to their normal oral hygiene routine more quickly and maintain cleaner teeth.

In short, MOP's advantages of reduced treatment time, minimal discomfort, and no recovery period are especially appealing for kids undergoing orthodontic treatment. It not only short **6.** MOP is a technique that harnesses the patient's own biology to create a cytokine effect that induces bone remodeling, allowing teeth to move into the desired position more predictably and faster. This biological approach aligns well with the need for a minimally invasive and effective treatment option that can be easily customized for each patient's specific orthodontic challenges.

In the end, MOP is a significant step in orthodontic treatment, making it more efficient, comfortable, and appealing for both kids and adults. Its ability to accelerate treatment while

The HealthyStart System

Micro-osteoperforation (MOP) has been a significant recent technique in orthodontics, especially for kids and adults looking to speed up their dental treatments. This minimally invasive procedure involves small, precise bone microperforations around the teeth, which stimulate bone remodeling and increase the rate of tooth movement. By harnessing the biological process of bone remodeling, MOP can significantly shorten the duration of orthodontic treatment, providing faster correction of dental crowding, alignment issues, and other complex orthodontic movements.

In clinical studies, MOP has shown to increase the speed of tooth movement by up to 62% compared to non-invasive orthodontic treatments. This accelerated process not only reduces the treatment time but also improves the predictability of outcomes, which is a significant concern for both patients and orthodontists. For kids, the benefits are especially appealing as it allows them to return to their normal routine more quickly, reducing the likelihood of long-term treatment side effects such as tooth root resorption and periodontal issues.

MOP is also highly effective during the alignment stage of orthodontic treatment. Studies have demonstrated that patients treated with MOP have shorter alignment duration compared to those without MOP, with more effective crowding correction. While there may be some increase in pain immediately after the procedure, this effect is short-term and does not significantly impat on long-term patient satisfaction.

The technique is micro-invasive and can be performed chairside in minutes, which is a significant clinical and economic benefits. It can be combined with other orthodontic modalities like clear aligners or braces, providing a more comprehensive treatment option. However, as with any medical intervention, it's important to evaluate the potential side effects and benefits for each patient individually.

In terms of biological effects, MOP stimulates a cytokine cascade that increases osteoclast activity, which is critical for bone remodeling. This process allows teeth to move more rapidly into their ideal position. While there are some reports of increased root resorption in some studies, other research has shown that MOP does not significantly contribute to this risk. The technique's safety and efficacy have been supported by both animal and clinical studies, highlighting it as a potential option for accelerating orthodontic treatment without extensive surgery.

In practice, MOP is indicated for a variety of orthodontic issues, including lower anterior crowding, canine impactions, and space closing. Its application can also help avoid surgical intervention in some cases, providing a more appealing option for patients who are looking to avoid extensive surgical treatments. By reducing treatment time and increasing predictability, MOP has the potential to improve patient satisfaction and outcomes in orthodontic care.





This non-invasive approach targets the natural development of children's teeth and jaw, using soft

dental appliances to align teeth and address breathing issues, reducing the need for more invasive treatments.

Micro osteoperforation, often shortened to MOP, is a minimally invasive technique used in orthodontics to accelerate tooth movement. This procedure, which creates small pinhole perforations in the bone surrounding the teeth, can be effectively used in conjunction with other orthodontic modalities, including braces and clear aligners. By inducing a controlled inflammatory response, MOP stimulates bone remodeling, which in return allows for faster and more predictable tooth movement.

The ability of MOP to improve treatment efficacy is well documented. It can reduce the need for extensive surgical intervention by harnessing the patient's own biology to stimulate bone remodeling. This not only shortens treatment duration but also reduces the likelihood of side effects associated with longer treatment times, like decalifications or "white lesions" and reduces the discomfort often experienced by adults during orthodontic treatment.

MOP is especially appealing to patients seeking to complete their orthodontic treatment quickly without sacrificing the quality of care. It can be used to address a variety of orthodontic issues, including difficult aligner movements, rotations, and space closing. The procedure is minimally invasive, requires no recovery time, and can be performed chairside, making it an efficient option for both clinicians and patients.

The Propel device is one of the most advanced technologies used for MOP, known for increasing the efficiency and patient satisfaction of the procedure. By using MOP in conjunction with other treatments, orthodontists can offer patients faster results with fewer office visits, making it an ideal option for busy adults and teens who want to achieve their desired smile without the long-term treatment typically associated with orthodontics.

Myobrace: A No-Braces Approach

Micro-osteoperforation (MOP) has been introduced as a technique to accelerate orthodontic tooth movement, which can significantly reduce the duration of orthodontic treatments. While MOPs have shown promising results in short-term studies, it is critical to assess their long-term effects on pulpal vitality, root resorption, and periodontal tissue to evaluate their safety and efficacy, especially in orthodontic treatments for kids.

In terms of pulpal vitality, existing evidence indicates that MOPs do not significantly change the pulp vitality status, which is a critical safety outcome for any orthodontic intervention[2]. However, the effects of MOPs on root resorption are more complex. While some studies suggest that MOPs may increase the risk of root resorption due to the inflammatory markers they stimulate[2][3]. other research indicates that MOPs do not significantly contribute to root resorption, especially in controlled conditions[3][4]. This variability in findings may be due to differences in study methods and sample sizes.

The effect of MOPs on periodontal tissue is also an important area of study. MOPs are known to increase the expression of inflammatory biomarkers, which can accelerate tooth movement by modulate bone resorption and formation[3][5]. However, this increase in inflammation may also have potential impacts on periodontal tissue, such as increased gingival inflammation, as observed in some studies[1]. The long-term effects on periodontal tissue need to be more clearly defined to assess the safety of MOPs in orthodontic treatments.

In clinical application, MOPs have been shown to shorten the alignment stage of orthodontic treatment, which is a significant time and efficiency outcome[1]. However, patient cooperation and potential side effects like caries formation and periodontal problems must be well controlled during the treatment process[1]. For kids undergoing orthodontic treatment, it is especially important to evaluate these effects to provide a treatment that is both effective and minimally invasive.

In the end, while MOPs have shown potential in reducing orthodontic treatment time, comprehensive long-term studies are necessary to provide clear evidence of their safety and efficacy in terms of pulpal vitality, root resorption, and periodontal tissue outcomes. This is especially pertinent for ensuring the well being of kids undergoing orthodontic treatments.



Myobrace offers a brace-free solution that corrects poor oral habits, guiding jaw and teeth alignment development in children, promoting natural growth and oral health.

Micro-osteoperforation (MOP) has been a topic of interest in orthodontic treatment due to its potential to accelerate tooth movement. A significant concern in orthodontics is external apical root resorption, a process where the root of the tooth shortens due to the treatment. Recent research has provided some clarity on this concern, highlighting that MOP does not significantly increase external apical root resorption, which is a critical safety and efficacy concern, especially in the treatment of kids.

The process of MOPs, which includes performing small perforations in the cortical bone, has been shown to stimulate alveolar bone remodeling, which can accelerate orthodontic tooth movement. This method is considered minimally invasive and can be used to simplify complex orthodontic movements and adjust anchorage. The effectiveness of MOP in accelerating tooth movement has been supported by several studies, including one that found a significant increase in canine retraction in patients undergoing MOP compared to a control group[1][4]. However, the long term benefits of MOP may be limited, as some studies suggest that the increased rate of tooth movement is most significant during the initial weeks of treatment[5]. For example, one study observed that MOP increased the rate of canine retraction only for the first 4 weeks, with no significant difference thereafter[5]. This initial increase in tooth movement can be a significant time and treatment outcome for patients, especially in the initial

The safety of MOP, especially regarding root resorption, has been a topic of considerable interest. Research has shown that MOPs can accelerate tooth movement without exacerbating root resorption, as indicated by studies using experimental tooth movements in rats[2]. These findings suggest that MOPs can be a favorable method for accelerating orthodontic treatment while ensuring safety for patients, including kids. This is important as root resorption is a potential side effect of orthodontic treatment that can have long term effects on tooth anchorage and overall tooth quality.

In comparison to other minimally invasive techniques like piezocision, MOPs have shown different efficacy levels. For example, one study found that piezocision had a higher rate of canine retraction compared to MOPs[4]. However, both methods are considered minimally invasive and are performed without significant tissue damage, which is a critical concern in orthodontic treatment.

In the end, MOPs present a favorable safety and efficacy for use in orthodontic treatment, especially in kids, by accelerating tooth movement without significantly exacerbating root resorption. This method can be a helpful intervention for orthodontic treatment, providing a minimally invasive and time and treatment outcome for patients.

About thumb sucking

For other uses, see Thumbsucker (disambiguation).



Infants may use pacifiers or their thumb or fingers to soothe themselves

Newborn baby thumb sucking



A bonnet macaque thumb sucking

Thumb sucking is a behavior found in humans, chimpanzees, captive ring-tailed lemurs, [¹] and other primates. [²] It usually involves placing the thumb into the mouth and rhythmically repeating sucking contact for a prolonged duration. It can also be accomplished with any organ within reach (such as other fingers and toes) and is considered to be soothing and therapeutic for the person. As a child develops the habit, it will usually develop a "favourite" finger to suck on.

At birth, a baby will reflexively suck any object placed in its mouth; this is the sucking reflex responsible for breastfeeding. From the first time they engage in nutritive feeding, infants learn that the habit can not only provide valuable nourishment, but also a great deal of pleasure, comfort, and warmth. Whether from a mother, bottle, or pacifier, this behavior, over time, begins to become associated with a very strong, self-soothing, and pleasurable oral sensation. As the child grows older, and is eventually weaned off the nutritional sucking, they can either develop alternative means for receiving those same feelings of physical and emotional fulfillment, or they can continue experiencing those pleasantly soothing experiences by beginning to suck their thumbs or fingers.^[3] This reflex disappears at about 4 months of age; thumb sucking is not purely an instinctive behavior and therefore can last much longer.^[4] Moreover, ultrasound scans have revealed that thumb sucking can start before birth, as early as 15 weeks from conception; whether this behavior is voluntary or due to random movements of the fetus in the womb is not conclusively known.

Thumb sucking generally stops by the age of 4 years. Some older children will retain the habit, which can cause severe dental problems.^[5] While most dentists would recommend breaking the habit as early as possible, it has been shown that as long as the habit is broken before the onset of permanent teeth, at around 5 years old, the damage is reversible.^[6] Thumb sucking is sometimes retained into adulthood and may be due to simply habit continuation. Using anatomical and neurophysiological data a study has found that sucking the thumb is said to stimulate receptors within the brain which cause the release of mental and physical tension.^[7]

Dental problems and prevention

[edit]



Alveolar prognathism, caused by thumb sucking and tongue thrusting in a 7-year-old girl.

Percentage of children who suck their thumbs (data from two researchers)

Age	Kantorowicz ⁴] Brückl[⁸]
0—1	92%	669/
1 2	0.20/	00%

1–2	93%	0070
2–3	87%	_
3–4	86%	
4–5	85%	25%
5–6	76%	
Over 6	—	9%

Most children stop sucking on thumbs, pacifiers or other objects on their own between 2 and 4 years of age. No harm is done to their teeth or jaws until permanent teeth start to erupt. The only time it might cause concern is if it goes on beyond 6 to 8 years of age. At this time, it may affect the shape of the oral cavity or dentition.^[9] During thumbsucking the tongue sits in a lowered position and so no longer balances the forces from the buccal group of musculature. This results in narrowing of the upper arch and a posterior crossbite. Thumbsucking can also cause the maxillary central incisors to tip labially and the mandibular incisors to tip lingually, resulting in an increased overjet and anterior open bite malocclusion, as the thumb rests on them during the course of sucking. In addition to proclination of the maxillary deficiency gives rise to posterior crossbite, ultimately leading to a Class II malocclusion.^{[10}]

Children may experience difficulty in swallowing and speech patterns due to the adverse changes. Aside from the damaging physical aspects of thumb sucking, there are also additional risks, which unfortunately, are present at all ages. These include increased risk of infection from communicable diseases, due to the simple fact that non-sterile thumbs are covered with infectious agents, as well as many social implications. Some children experience social difficulties, as often children are taunted by their peers for engaging in what they can consider to be an "immature" habit. This taunting often results the child being rejected by the group or being subjected to

ridicule by their peers, which can cause understandable psychological stress.^{[11}]

Methods to stop sucking habits are divided into 2 categories: Preventive Therapy and Appliance Therapy.[¹⁰]

Examples to prevent their children from sucking their thumbs include the use of bitterants or piquant substances on their child's hands—although this is not a procedure encouraged by the American Dental Association[⁹] or the Association of Pediatric Dentists. Some suggest that positive reinforcements or calendar rewards be given to encourage the child to stop sucking their thumb.

The American Dental Association recommends:

- Praise children for not sucking, instead of scolding them when they do.
- If a child is sucking their thumb when feeling insecure or needing comfort, focus instead on correcting the cause of the anxiety and provide comfort to your child.
- If a child is sucking on their thumb because of boredom, try getting the child's attention with a fun activity.
- Involve older children in the selection of a means to cease thumb sucking.
- The pediatric dentist can offer encouragement to the child and explain what could happen to the child's teeth if he/she does not stop sucking.
- Only if these tips are ineffective, remind the child of the habit by bandaging the thumb or putting a sock/glove on the hand at night.
- Other orthodontics^{[12}] for appliances are available.

The British Orthodontic Society recommends the same advice as ADA.^[13]

A Cochrane review was conducted to review the effectiveness of a variety of clinical interventions for stopping thumb-sucking. The study showed that orthodontic appliances and psychological interventions (positive and negative reinforcement) were successful at preventing thumb sucking in both the short and long term, compared to no treatment.^[14] Psychological interventions such as habit reversal training and decoupling have also proven useful in body focused repetitive behaviors.^[15]

Clinical studies have shown that appliances such as TGuards can be 90% effective in breaking the thumb or finger sucking habit. Rather than use bitterants or piquants, which are not endorsed by the ADA due to their causing of discomfort or pain, TGuards break the habit simply by removing the suction responsible for generating the feelings of comfort and nurture.[¹⁶] Other appliances are available, such as fabric thumb guards, each having their own benefits and features depending on the child's age, willpower and motivation. Fixed intraoral appliances have been known to create problems during eating as children when removing their appliances may have a risk of breaking them. Children with mental illness may have reduced compliance.[¹⁰]

Some studies mention the use of extra-oral habit reminder appliance to treat thumb sucking. An alarm is triggered when the child tries to suck the thumb to stop the child from this habit.[¹⁰][¹⁷] However, more studies are required to prove the effectiveness of external devices on thumb sucking.

Children's books

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- In Heinrich Hoffmann's *Struwwelpeter*, the "thumb-sucker" Konrad is punished by having both of his thumbs cut off.
- There are several children's books on the market with the intention to help the child break the habit of thumb sucking. Most of them provide a story the child can relate to and some coping strategies.^[18] Experts recommend to use only books in which the topic of thumb sucking is shown in a positive and respectful way.^[19]

See also

[edit]

- Stereotypic movement disorder
- Prognathism

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Further reading

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External links

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- "Oral Health Topics: Thumbsucking". American Dental Association. Archived from the original on 2010-06-19.
- "Pacifiers & Thumb Sucking". Canadian Dental Association.

About dental caries

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