

A SYSTEMATIC REVIEW OF DIFFERENT DEBONDING METHODS AND FIXED ORTHODONTIC TREATMENT IN INFANTS, CHILDREN AND ADULTS

MARYAM SAYYARI

Graduate of General Dentistry, Tehran University of Medical Sciences, Tehran, Iran.
Email: Mm_sayyari@yahoo.com

NADER GHOTBI

General Dentist, Isfahan Azad University, School of Dentistry, Isfahan, Iran. Email: ghotbi.nader@gmail.com

HODA GHODRATI

Postgraduate Student, Department of Prosthodontics, School of Dentistry, Shahid Beheshti University of Medical Sciences, Tehran, Iran. Email: Hoda.gh95@gmail.com

ALI AJELI BAZKIAYI

Postgraduate Student, Department of Orthodontics, School of Dentistry, Shahid Beheshti University of Medical Sciences, Tehran, Iran. Email: Aliajeli93@gmail.com

LEYLI HAGHIGHI

Postgraduate Student, Department of Pediatrics, Islamic Azad university of Tehran, Tehran Dental Branch, Tehran, Iran. Corresponding Author Email: l.haghighi@student.iautmu.ac, l.haghighi@student.iautmu.ac.ir

Abstract

In this study, Different Debonding Methods and Fixed Orthodontic Treatment in Infants, Children and Adults was investigated. Dental orthodontics is one of the dental services that has a significant impact on the beauty of the smile. Today, dental services are beyond a simple tooth extraction and routine treatments. Nowadays, with the advancement of technologies in the field of medicine and especially dentistry, dental treatments and services have become much more diverse, and a major part of these treatments is dental beauty services. One of the most demanded dental services and treatments today is orthodontic treatment. This treatment can be done for people with different conditions and at different ages. There are different types of orthodontics and the conditions and methods of doing it are different depending on the conditions. In the first step, it is better to get a precise definition of this treatment method. This method of treatment is a branch of dental science that helps to solve problems related to the arrangement of teeth and lower and upper jaws. In fact, orthodontic treatment is the main treatment method to achieve the proper arch of the teeth and the beauty of the smile.

Keywords: Debonding Methods, Fixed Orthodontic, Infants, Children, Adults

INTRODUCTION

One of the main features of dental orthodontics is that it makes your teeth more beautiful and tidier. If your teeth are not in a row next to each other or if your jaw does not fit together well, this cosmetic and therapeutic dental procedure can straighten your teeth [1-3]. On the other hand, with the help of this method, talking and problems in chewing can also be solved. So, if your teeth were irregular before orthodontics, then your teeth will be regular. If your jaw was

already overbite or under bite, then your jaw will fit better than before [4].

What are the types of orthodontics?

In general, orthodontic treatment is done with different methods. The first classification for orthodontic types is based on the type of problem. If the problem is with the teeth, orthodontics will be performed. For example, orthodontics may be done for all teeth or only for some teeth. But in cases where the problem is from the jaw, jaw orthodontics is performed, which includes lower jaw orthodontics, upper and lower jaw orthodontics [5-7]. Another category is related to the types of fixed and mobile orthodontics (Figure 1). These methods themselves are divided into many other types. Different tools and techniques are used in these methods. For example, invisible orthodontics or glass orthodontics are among these techniques in which special brackets are used [8].



Figure 1: Orthodontics

The most common orthodontic procedures include the following

- Traditional orthodontics;
- Mini screw;
- Dimon method orthodontics.

In the traditional method, brackets can be metal, ceramic or composite and placed in front of the tooth or behind the tooth.

1. Traditional Orthodontics

In the traditional method, the same old normal brackets are used. These metal brackets are attached directly to the teeth and return the teeth to their correct positions. During the time that

the brackets are on the teeth (2 to 4 years), the orthodontist gradually tightens or loosens the wires. Some brackets are transparent and ceramic or composite instead of metal. These tooth-colored brackets improve the appearance of teeth during treatment. Lingual brackets are another category of brackets that are attached to the teeth and are used to correct improper alignments. These brackets are usually attached behind the teeth [9-11]. Using these brackets does not disturb the movement of the lips and people can speak more easily.

2. Mini Screw Orthodontics

In this method of orthodontic treatment, a small metal screw called a mini screw is attached to the jawbone through the gum to help move the teeth as an anchor and holder. This very advanced treatment technique is also known as micro-screw, mini-implant or temporary anchor device. This treatment method can be used as an anchor to straighten the teeth and close the gap between them. Mini screw treatments can be done along with traditional orthodontic treatments. To place this screw in the jaw, a hole is usually needed to be made in the jaw, and local anesthesia is usually used for this [12].

3. Dimon Orthodontic Method

Another more advanced technique that can be mentioned for orthodontic treatment is Dimon orthodontics. In this method, special brackets are used. These brackets use a unique sliding mechanism that allows people's teeth to move more freely. In this way, the friction of the teeth is reduced. In this treatment method, the person needs to visit the dentist less. That means you don't need to visit the doctor's office constantly to tighten or loosen the wires and brackets. In Dimon's method, the teeth move faster, and as a result, you will get results sooner. In this method, it is less necessary to pull teeth for orthodontics [13-15]. The newer method of orthodontics is mini-screw (connecting a screw to the jaw) and Dimon (using a special bracket), which reduce the time of orthodontics and the number of visits.

1. Fixed orthodontics (invisible orthodontics or ceramic orthodontics and colored orthodontics)

One of the methods of orthodontics is fixed orthodontics. As the name suggests, these tools are attached to the tooth and cannot be removed by the patient. This treatment method is mostly used to move teeth and treat dental abnormalities. Therefore, fixed orthodontic treatment is also known as dental orthodontics. In fixed orthodontics, special tools and devices are used, which are the most common devices used for orthodontic treatment today. This method itself is divided into 2 subcategories:

- Normal fixed orthodontics or colored orthodontics (there are different types of color; for example, purple orthodontic color or golden orthodontic color);
- Invisible fixed orthodontics.

Common types of fixed brackets are those that are commonly used and are seen with a smile. These brackets are attached to the front of the teeth and are connected using special wires. The braces used in the normal fixed technique are of metal type. In another technique that is also fixed, the orthodontist uses special brackets called glass, transparent, ceramic or invisible

brackets. These brackets are not visible and it is called invisible orthodontics [16]. These transparent brackets, which are usually plastic, are specially molded and made for the patient. They are almost invisible and by using them, no one will notice the presence of orthodontics in their mouths. The price of orthodontics in the invisible method is higher than the conventional technique. However, due to the cleanliness of transparent orthodontics and its more beautiful appearance, many people prefer this type of orthodontic brackets. There are different types of fixed orthodontics that use different braces to align the teeth.

2. Removable orthodontics

The next technique is removable orthodontics. In this method, movable brackets are used. These brackets are usually movable plastic plates that cover the roof of the mouth. This method is used when we want to perform orthodontics for a number of teeth (Figure 2).

This method itself is divided into 2 categories:

- Conventional mobile orthodontics;
- Invisible movable orthodontics.

Removable brackets can be used to correct minor problems or as part of fixed orthodontic treatment. When the period of fixed orthodontic treatment is over, removable brackets may be used to fix the teeth and maintain the fixed orthodontic treatment. Usually, in cases where jaw orthodontic treatment is needed, various types of movable brackets are used. Sometimes this therapeutic technique is used to prevent children from sucking their thumbs, which should be done by a pediatric orthodontist [17]. These brackets should be removed from the mouth for cleaning or during certain activities as a precaution. The orthodontist will teach you how to remove the bracket and the necessary steps. Removable brackets can be used to correct minor problems or as part of fixed orthodontic treatment.



Figure 2: Removable orthodontics

Lingual orthodontics (a type of invisible orthodontics)

Lingual orthodontics is one of the types of orthodontics that is fixed behind the teeth. This type of orthodontics is practical and relatively expensive, and it can be suitable for people who are older and do not have confidence in orthodontics.

Treatment with a functional bracket

One of the types of brackets used for orthodontic treatment is the functional type with the same functional orthodontics. These brackets are used to treat improper growth of the jaw. These brackets can change the way the jaw grows and correct its deformity. This treatment method can also help a lot in solving certain types of problems [18].

What is two-phase orthodontics? The best method for children's orthodontics

Biphase orthodontics means that younger patients do not have to undergo severe and difficult orthodontics in the later stages of life. The American Association of Orthodontists emphasizes the necessity of evaluating children by an orthodontist at 7 or 8 years of age and performing orthodontics for children. This timely referral is recommended to evaluate problems that can be beneficial in early phase treatment. If early orthodontics is done while the teeth and jawbone are still growing, orthodontic treatment will be easier and less severe.

- The first phase involves the use of expanders and other dental devices that create more space in the jaw for the incoming teeth. This may reduce the need for tooth extraction or jaw surgery in the future.
- The second phase usually begins when most of the adult teeth have grown. In fact, the second phase of treatment includes the use of brackets or braces after the growth of adult teeth.

As we said, in order for your child to have healthy and tidy teeth in the future, he should be examined by a pediatric orthodontist at the age of 7 or 8. So enter the link below right now, find the best pediatric orthodontist and make an appointment to examine your child's teeth and jaw. People who have irregular teeth can use this method to improve the beauty of their teeth.

Who is dental orthodontics for and what is its application?

Orthodontics is used in various cases, some of which include the following:

- In some people, the mouth is small and there is not enough space for teeth to grow. For example, some teeth may have grown crookedly, or some of them may have grown twisted or twisted. For this reason, the teeth of these people grow in crooked and inappropriate positions. In all these cases, with the help of orthodontics, this problem can be solved and the teeth can be smooth, uniform, regular and have a proper arch [19].
- This treatment, in addition to being a method of straightening or moving teeth to improve their appearance, can also help in long-term care of the health of teeth, gums and jaw joints.

- Also, this treatment spreads the pressure caused by biting different foods, especially hard types, on all the teeth and thus prevents damage to the teeth and jaw.

Who needs this treatment?

Who needs orthodontics? In the following cases, we have mentioned groups of people who can treat and solve their problems with the help of orthodontics:

- If you have messy and crooked teeth, you need orthodontics to straighten your crowded and crooked teeth. By using this treatment, your teeth will be moved to a better position.
- People who have crowded teeth or people whose teeth have not grown and have a gap between the teeth will also be candidates for orthodontics.
- Those who have a gap between their teeth or have an inappropriate appearance due to the loss and loss of teeth and their lack of regrowth, which can be corrected with the help of orthodontics.
- The next group are people whose upper and front teeth are protruding and have an inappropriate appearance. These protruding and prominent teeth are more likely to be damaged than usual. These people can return their teeth to their normal line with the help of orthodontic treatment.
- People who have problems with their upper and lower jaw also need orthodontic treatment.
- Those who have protruding lower teeth are one of the groups that should have orthodontics.
- In some people, the size of the upper and lower jaw is not proportionate. When the lower half of the jaw is too small, it causes the upper jaw to sag when the jaw is closed. This state is called overbite. The opposite situation is when the lower half of the jaw is bigger than the upper half, which is called under bite. These people also need orthodontic treatment to fix jaw abnormalities. People with all kinds of jaw abnormalities and misaligned teeth can have orthodontics provided they have healthy jaw bones and primary teeth.

Who cannot use this treatment?

For many, the question arises as to who can be good candidates for orthodontic treatment and in which people it is not possible to do this. It is better to know that there is no age limit for getting braces. According to the American Association of Orthodontists, a large number of patients over the age of 18 visit dental clinics every day to have dental brackets installed. The only requirement for orthodontic treatment is to have healthy jawbones and permanent teeth. As a result, it is inappropriate and impossible to perform orthodontics only for those who have artificial teeth or whose jaws are broken and damaged for any reason. The only requirement for orthodontic treatment is to have healthy jawbones and permanent teeth [20].

What are the benefits of orthodontics?

Dental orthodontics has many advantages. Some of them include the following:

- This very effective treatment method can help to correct the deformity of the teeth and jaw and will have a great effect on improving people's appearance from an aesthetic point of view.
- Achieving a balanced appearance, a beautiful smile and a beautiful face is one of the advantages of using the orthodontic treatment method.
- This treatment method can help to solve the genetic problems of the jaw and mouth. Treatment of jaw abnormalities is very important for people's health.
- Orthodontic treatment methods can in turn prevent further problems. For example, swallowing and chewing problems are usually solved with orthodontics.
- Many people need orthodontic treatments to solve problems with the jaw and its joints, such as weakening of the jaw joints and locking of the jaw. These treatments can reduce or eliminate complications and problems caused by these abnormalities.
- Aligning the teeth and fixing the inconsistencies created in the mouth, especially protruding gums or teeth growing together, can increase the risk of decay and infections of the gums and teeth. Orthodontic treatment can prevent these problems to a large extent.
- In general, orthodontic treatments can increase the health of teeth and increase their lifespan.

To perform orthodontics, it is necessary to be examined and the best way to place brackets.

What are the stages of orthodontics?

In general, orthodontic procedures are divided into 3 general parts.

- The first stage is before placement, which includes the same initial examination, examining the conditions of the teeth and jaw, and choosing the treatment method.
- The next step includes orthodontic placement. Placement of wires and brackets is done according to the severity of the teeth problem and the treatment method at this stage. This stage takes time and may last between 6 months and 4 years. During this period of time, wires and brackets should be adjusted and loosened and tightened as needed. After the treatment is complete, the brackets and wires should be removed from the mouth.
- In fact, after orthodontics, there is another stage that includes the retainer. At this stage, special tools will be placed in the mouth to maintain and fix the teeth. Each of these steps has to be done individually and must be done by a professional orthodontic specialist. The final result of orthodontic treatment will largely depend on the correct performance of each of these steps.

Orthodontics is suitable for any person with permanent teeth and a healthy jaw, this treatment has 3 stages, initial examinations, placing wires and brackets and finally removing them [21].

How is orthodontics performed?

- After a complete examination and diagnosis of the condition of the teeth and jaw, the appropriate treatment method is chosen. The stages of orthodontic treatment are different depending on the desired treatment method. In each of these methods, some steps may be required. For example, tooth extraction for orthodontics may be one of the prerequisite steps.
- Scaling of teeth or clear orthodontic scaling, choosing the right brackets to start the treatment, filling and denervation of defective teeth and other such things can be part of the orthodontic procedures.
- Then the orthodontist places the brackets and connects them with special wires.
- The next steps for the treatment include timely visits to the office and checking the condition of the brackets, the amount of changes in the position of the teeth and the displacement of the jaw, etc. Please note that dental orthodontic procedures may be different from the procedures required for jaw orthodontics.
- Jaw orthodontics can be for the upper jaw alone, both jaws or lower jaw orthodontics. In all these cases, orthodontic procedures may be different.
- Tightening and loosening of the wires, necessary care during orthodontics such as orthodontics at night and solving possible problems can all be part of orthodontic procedures.
- Patients should have regular visits, usually once every 1 or 2 months. During the visit, the doctor will attach wires, springs, or elastic bands to the brackets to put more tension and pressure on the teeth and put them in their proper position. Of course, each of these cases of the orthodontic procedure may be different depending on the orthodontic methods. Viewing dental orthodontic video or dental orthodontic photo can give you good information. One of the methods used to improve orthodontic performance is orthodontic toothbrush and orthodontic wax (Figure 3).

What is orthodontic wax?

Braces are placed on the dental tissue and can damage the gums and teeth. Definitely, the dentist uses a method to prevent this method. Orthodontic wax is such a thing. According to thurmanortho, using orthodontic wax can prevent damage and pressure on the gums and teeth. You can use this wax yourself, and for this, it is enough to wash your hands and apply a little of it with your finger on your teeth and braces [22].

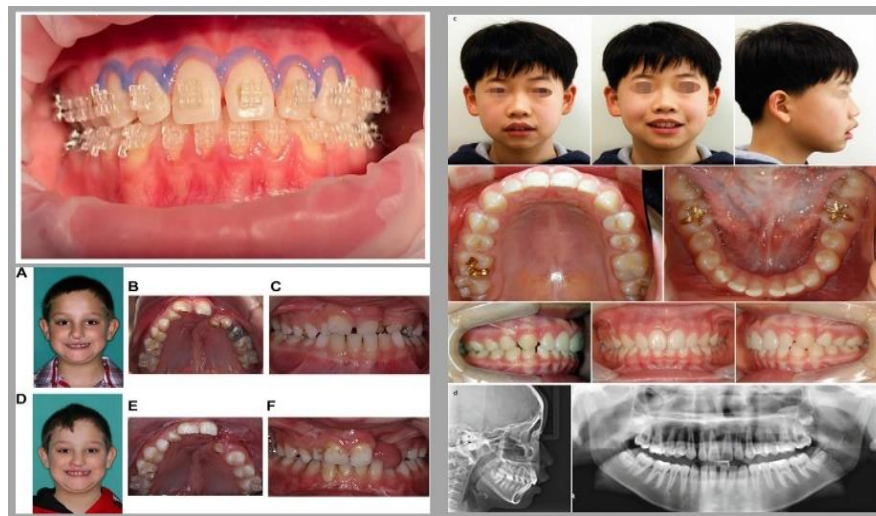


Figure 3: What is orthodontic?

What is an orthodontic brace and what is its use?

Elastic or orthodontic band is a rubber band that regularizes the distance between teeth and jaws. With the help of orthodontic braces, the connection between the upper and lower jaw and your teeth is maintained. The upper and lower brackets and the front and back of your teeth fit together well. Orthodontic braces can have different colors and even be invisible.

Black orthodontic band

As we said, orthodontics can have colored bands, and the choice of this color is chosen according to the patient's taste and consultation with the dentist. One of the colors used for orthodontic braces is black.

What should be done before orthodontics?

To start the orthodontic procedures, the patient must first consult an orthodontist or a dental orthodontic doctor. At this stage, a complete examination is performed. This examination includes the following:

- Examination of teeth;
- Photographing teeth with X-rays;
- Making plaster models of teeth, etc.

Photos, templates, computer models are used to diagnose the problem. X-ray images will give the orthodontist a very good view of the condition, placement and extent of the teeth protruding from the gums. In addition, it will show the relationship between the teeth and the jaw. Before and after photos of orthodontics are necessary to check the changes and progress of the treatment. The dentist diagnoses the irregular teeth and jaws and determines the types of orthodontic treatment methods based on the patient's conditions, the budget, the severity of the problem, etc. In the meantime, a series of prerequisites are needed to start dental and jaw

orthodontics to determine the conditions for placing devices and tools. Orthodontics has three stages and can last from 6 months to 4 years [23].

How is the care and cleaning of teeth during orthodontics?

A very important part of the orthodontic procedure is related to the necessary care after placing the brackets and after removing the wires and brackets. Keep the following in mind:

- During the time that the device is in the mouth, depending on the type of brackets (fixed or movable), the principles of cleaning, oral and dental hygiene, and necessary care during eating and exercise must be observed.
- Usually, people who do orthodontics should use special orthodontic rubber, orthodontic toothbrush, orthodontic floss and similar care tools. These devices are all made for dental orthodontics.
- Care and cleaning of teeth during orthodontics is also very important. Accumulation of food and not observing oral and dental hygiene can cause tooth decay and damage and affect the final result. Compliance with hygiene principles is also necessary to reduce the complications caused by orthodontics. Yellowing of teeth in orthodontics can be caused by not cleaning the teeth and not following the principles of oral and dental hygiene.
- People who have orthodontics must be cautious about consuming certain foods. Consuming acidic foods and carbonated drinks, chewing gum and hard chocolates, biting apples and hard fruits or similar things are all the most important principles of care after orthodontics.

What is an orthodontic toothbrush and what is its use?

An orthodontic toothbrush is a cleaning tool used by people with braces. We said that after performing orthodontics, one of the most important things that helps the success of this method is to observe hygiene tips and keep the teeth clean. If you do orthodontics to make your teeth more beautiful, but forget to follow the hygiene tips, your teeth will definitely be lost and orthodontics will have a negative effect on your life. One of the ways you can use it to improve your teeth cleaning is to buy an orthodontic toothbrush and clean your teeth with it. The shape of this toothbrush is different from normal toothbrushes. This toothbrush is small and narrow and has strong plastic bristles [24].

What is orthodontic floss?

You might think to yourself that it is impossible to floss with orthodontics. But it is better to know that flossing is even more necessary when you have orthodontics. The best time to floss for orthodontics is after dinner and before bed. Orthodontic dental floss is a floss that contains fluoride, wax, and aromatic substances, which provides more protection for teeth and ease of flossing.

What is an orthodontic pacifier and what is it used for?

Parents who want to help their child's jaw to be in an appropriate and optimal position from infancy can use an orthodontic pacifier. This tool is placed in the baby's mouth and is similar to the mother's nipple. By sucking on this pacifier, the jaw will be in its proper position. Also, this method prevents overbite and under bite as much as possible. Taking care of orthodontic teeth is very important and for this you need to use special care tools.

Necessary care in using fixed orthodontic bracket

People who use the fixed orthodontic treatment technique, after a few days, they can eat a variety of foods with little restrictions. For example, acidic drinks and toffee chocolates, hard and sticky sweets, carbonated drinks and hard foods are prohibited for them. Biting and chewing gum is also prohibited for these people. These actions can damage both the orthodontic bracket and the teeth and jaw. When it comes to sports, these people should be careful and when playing sports such as rugby, football or similar sports, they must use a protector to take care of their teeth.

Necessary care for removable orthodontics

Since this type of orthodontics is movable and it is possible to remove the brackets, it is better to remove the movable orthodontic device while eating to maintain the hygiene and cleanliness of the transparent orthodontics. This will make the process of cleaning and washing the mouth, teeth and brackets easier.

Tooth enamel restoration and its different methods

Tooth enamel and orthodontics

In some cases, this question may arise for those who refer for orthodontic treatment, whether orthodontics can cause tooth enamel erosion? If you pay attention to the consultations and guides during the orthodontic treatment by the orthodontic specialist during the treatment process of fixed orthodontics, mobile orthodontics and even invisible orthodontics, then there will be no problems regarding the erosion of the teeth [25]. Actually, during the first treatment session, the orthodontic specialist examines all the following cases and provides the necessary guidance for dental orthodontic care. If the person follows the mentioned things, then there will be no worries (Figure 4).

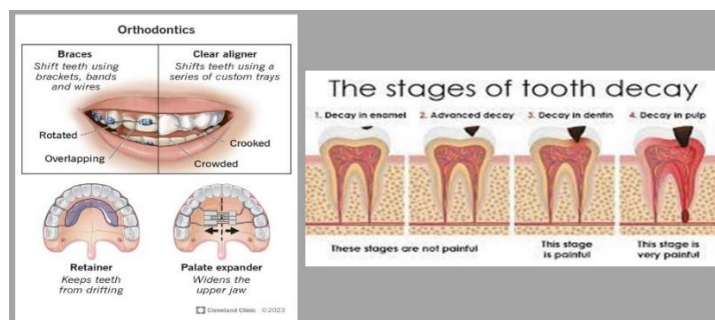


Figure 4: Tooth enamel and orthodontics

Tooth enamel restoration

Restoration of tooth enamel by itself is not possible because tooth enamel is not a living organ and cannot repair a damaged tooth.

To repair and treat damaged enamel, doctors suggest the following

Veneer, composite and tooth bonding

In this treatment, in order to repair the damaged enamel, the doctor repairs the dental structure using special materials and the same color as the tooth. In this case, the tooth is not repaired, but it protects the tooth from further wear and tear.

Dental crowns

Another treatment method is dental veneers or lamination, which are used more often when the damage is more severe than before.

Night guard

Night guard is the same tooth protector that is designed by the doctor for the client to prevent bad habits such as teeth grinding. With this device, future injuries are prevented.

Child orthodontics

The first examination of children should be done at the age of 6 to determine whether their teeth or jaws require fixed orthodontics in children with various advantages and costs. To diagnose orthodontics, only a dentist examination is not enough, and the child must be examined by a pediatric orthodontic specialist [26]. The right time for a child's orthodontic examination is 6 to 7 years old and before puberty, and it is better to do the treatment before the age of 8 to 9 years. If a child has a jaw problem at the age of starting treatment, mobile orthodontics or jaw orthopedics is performed for him. In the mobile orthodontic method, a mobile plate is placed in the child's mouth.

The reason for the importance of orthodontics for children

Children, like adults, may suffer from dental problems such as crookedness, overlapping teeth, crowding of teeth or "Malocclusion" (difference in the size of the upper and lower jaw that causes the mouth to close poorly), and therefore, fixed orthodontics in children need a variety of benefits and costs. Sometimes jaw and teeth problems cause tooth decay and the child loses his teeth early.

Why and when do children need orthodontics?

If the patient has any of the following problems or conditions, orthodontics for children can be useful for him:

- Early loss of permanent teeth;
- Difficulty chewing food;
- Breathing through the mouth;

- Thumb sucking;
- Crowding and disorganization of teeth or having extra teeth;
- Jaws being too forward or backward in relation to each other;
- Constant biting of the cheek (from the inside);
- The front teeth are not placed on top of each other or they are placed in an unnatural way;
- Asymmetric facial appearance due to misalignment of teeth or jaw;
- Grinding teeth.

Types of fixed orthodontics

Dimon orthodontics: Dimon orthodontic braces are made of the same metal used in the production of traditional metal braces. However, Dimon braces do not require the use of elastic, and in this way, the number of treatment sessions is less and less wear and tear is caused on the teeth as a result of using them. Dimon braces are made of metal, ceramic or transparent brackets. These braces are the same size as metal dental braces, but they use special clips to help hold the orthodontic wires to guide the mouths to the correct place.

Dimon Orthodontics: These clamps help to reduce the pressure applied to the teeth, and because they do not need elastic or its replacement, they need less correction. The cost of Dimon orthodontics or other orthodontic procedures should not stop you from achieving the smile you have always dreamed of. Dimon's braces depend on the amount of correction your teeth need. Many dental insurances provide resources for treatment with Dimon braces (Figure 5).



Figure 5: Types of fixed orthodontics

Types of fixed orthodontics

Ceramic orthodontics: Ceramic braces are made of transparent raw materials, and that's why they attract less attention than metal braces. For this reason, ceramic braces are mainly used for young people and adults who have special concerns related to facial beauty. Although these types of braces attract less attention, they require more care to maintain oral health, because ceramic braces are larger and more fragile than normal metal braces. For these reasons, invisible orthodontic steps in ceramic braces are mostly used for upper front teeth in the mouth.

Metal braces

The old metal braces, usually made of high-grade stainless steel, are still the most widely used fixed orthodontic braces. Metal braces have metal rods that wrap around the molars and smaller metal brackets that are cemented to the front surfaces of the other teeth. A thin, spiral metal wire between the brackets gently guides the teeth into the correct position. This arch wire is fixed to the brackets with flexible elastics, metal fasteners or clips of other types.

Invisible lingual braces

Although ceramic braces are not very visible, there is another orthodontic method that makes fixed braces practically invisible. These invisible braces, known as lingual braces, are placed behind the teeth on the tongue side. The mechanism of their performance and effectiveness is similar to other metal braces, but despite being made of metal, they are not visible because they are hidden behind the teeth. In fixed orthodontics in children, all kinds of advantages and costs, braces with happy colors are used, which by applying constant pressure on the teeth correct the irregularities and make them straight. Some dentists also use headgear to treat children's teeth. A headgear is a wire, horseshoe-like device that is attached to a child's back teeth and pulls them back to make more room for the front teeth [27]. After installing braces, the child should be seen by the dentist every few weeks. The duration of a child's use of a brace depends on the extent of his problem, but this time is estimated at an average of 2 years, after which the child can use a small retainer for a short time. This mold, which is generally made of hard plastic with metal wires or a plastic mouth guard, prevents the teeth from returning to their original place.

When is the minimum age for orthodontic treatment?

There is no specific age for orthodontic treatment. The treatment plan depends on the patient's needs. For example, a child with a cleft palate should be treated before the first teeth erupt. Other children may be better off starting treatment at age 6 or 7, even if they haven't lost all their baby teeth [28]. The goal of early treatment is to prevent dental problems in the future. With the initial treatment, a better space is created in the mouth for the eruption or growth of permanent teeth. Many children who need early orthodontic treatment may need to use brackets to complete the treatment in adulthood. But most of the treatment work has already been done and there is very little (if any) need for follow-up treatment.

Benefits of orthodontics in childhood

Fixed orthodontics in children, the benefits and costs of adults, often require a longer period of time and may require tooth extraction or oral surgery. In this way, the possibility that you will need tooth extraction or oral surgery in the future will be minimized.

Benefits of orthodontics in childhood

For young people who have certain signs and symptoms of the need for preventive orthodontics. This treatment method can provide an opportunity for them to enjoy the following advantages and benefits:

- Guidance and correct growth of the jaws;
- Adjusting the width and curvature of the upper and lower roof of the mouth;
- Guide permanent teeth that have been deviated to a healthy and natural state;
- Reducing the risk of injury from protruding front teeth.

Benefits of orthodontics in childhood

- Helping to quit harmful habits such as thumb or other finger sucking, which can be a cause of jaw and teeth deviation;
- Reduce or eliminate problems in swallowing food or speech ability;
- Improving appearance and self-confidence level;
- Helping to simplify or shorten the period of fixed orthodontic treatment in children, all kinds of benefits and costs in the future if it needs to be done as part of a comprehensive treatment plan;
- Reducing the possibility of permanent teeth being impacted (that is, teeth that need to grow and come out of the gums, remain inside the gums and soft tissues) and maintain or create enough space for the teeth that are coming out of the gums to grow.

Duration of child's orthodontic treatment

The length of treatment varies and depends on the severity of the problem, the cooperation of the child and his development. Usually, in most people, the treatment period will be 18 to 36 months.

How to take care of a child's orthodontics?

As mentioned, braces are used for children's orthodontics. Taking care of the teeth during braces is one of the points that parents should pay attention to. It is necessary to brush teeth after every meal and use dental floss. In addition, it is necessary to check the teeth regularly to prevent decay. Parents should take care of the child so that he avoids eating certain foods such as popcorn, candy, sweet drinks, fruit juice and chewing gum. If the plastic braces are loose or the tips of the wires are sharp, the child should be taken to the dentist immediately [29].

DISCUSS

The difference between orthodontics in children and adults

Orthodontics is done for the disparity of the teeth and their alignment, which in addition to the treatment of the teeth, also has an effect on the beauty of the appearance. Many people believe that orthodontics should be done in childhood. In adulthood, it is a useless task and has no result. This way of thinking is completely wrong (Figure 6 & 7). Doing this in adulthood also has favorable results. But there are problems in the treatment of adults that are less common in children. Join us in this article to discuss the difference between orthodontics in children and adults.

Characteristics of dental orthodontics in children

Many children due to problems such as genetic origin or bad childhood habits such as finger sucking and... They need to do orthodontics because the correct form of teeth alignment is messed up. It also causes them to face jaw and dental problems. Performing orthodontics in children helps maintain the function of teeth in children. Fix their jaw and teeth problems. It also prevents tooth decay, secondary diseases such as digestive problems, improper growth of permanent teeth, occurrence of tooth deviation and disharmony between the upper and lower jaw. The best time for children to have oral and maxillofacial examinations is between 8 and 10 years of age. Because at this age, all permanent teeth of the child have grown enough. Therefore, if the child's teeth are facing problems, by examining them, specialists can determine whether orthodontics is needed or not. Just note that some children's permanent teeth do not grow until the age of 10. Therefore, orthodontic specialists start the treatment a little later. But they use alternative methods until the work is done [30].

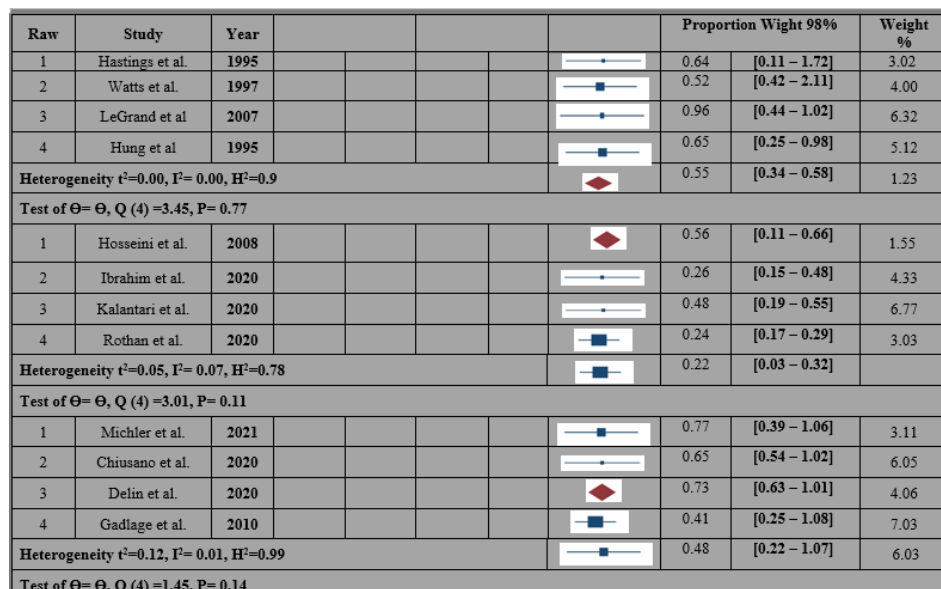


Figure 6: Forest plot showed Different Debonding Methods in Infants, Children and Adults

Raw	Study	Year	Severe COVID-19		non-Severe COVID-19		Forest Plot	Proportion Wight 98%		Weight %
			Yes	No	Yes	No				
1	Wang et al.	2021						0.85	[0.39 – 1.02]	6.02
2	Kragholm et al.	2021						0.83	[0.42 – 1.01]	5.92
3	Papadopoulos et al	2021						0.74	[0.55 – 1.02]	5.65
4	Team	2020						0.91	[0.48 – 1.08]	6.03
Heterogeneity $t^2=0.00$, $I^2= 0.00$, $H^2=1.00$								0.98	[0.20 – 1.08]	
Test of $\Theta= \Theta$, $Q (4) =3.99$, $P= 0.66$										
1	Hafeez et al.	2020						0.68	[0.52 – 1.06]	6.02
2	Wang et al.	2020						0.74	[0.31 – 1.08]	5.92
3	Guan et al	2020						0.89	[0.19 – 1.01]	5.65
4	Zhang et al	2020						0.90	[0.29 – 1.02]	6.03
Heterogeneity $t^2=0.00$, $I^2= 0.00$, $H^2=1.00$								0.98	[0.20 – 1.06]	
Test of $\Theta= \Theta$, $Q (4) =4.44$, $P= 0.71$										
1	Piva et al.	2020						0.92	[0.39 – 1.06]	5.03
2	Zhang et al.	2020						0.87	[0.54 – 1.02]	6.02
3	Haghighi et al.	2020						0.88	[0.63 – 1.01]	5.57
4	Jebril	2019						0.60	[0.25 – 1.08]	6.13

Figure 7: Forest plot showed Fixed Orthodontic Treatment in Infants, Children and Adults

Other benefits of doing orthodontics in childhood

A series of benefits of orthodontics in childhood have been mentioned above, and other benefits are also mentioned in full in the following line:

- Jaw deformities and problems are easier to deal with in childhood;
- It costs less than adults;
- Discovering hidden teeth problems;
- Extraction of permanent teeth is reduced in such people;
- The risk of dental impaction is reduced;
- Guide the growing teeth in their correct position.

Features of dental orthodontics in adults

Some people did not treat the dental and jaw abnormalities they had in childhood. Therefore, in adulthood, they need orthodontics to solve this problem. Orthodontics in adulthood corrects and aligns the teeth in the mouth. In order for a person to have orthodontics as an adult, he must have healthy gums. It should be noted that some jaw abnormalities require surgery in addition to orthodontics, which is called ortho surgery or orthognathic surgery [31]. It is also better to know that the loss of marginal bones makes orthodontics more difficult in adults. As mentioned above, some adults are embarrassed by orthodontics and traditional metal braces on their teeth.

They can use other braces instead of traditional braces to treat their teeth, which are mentioned in the following line:

➤ **Clear ceramic braces**

Transparent ceramic braces are completely similar to the color of your teeth. It is also better to know that they are produced from ceramic materials. Ceramic material reduces the staining of your teeth. It also reduces the risk of losing your enamel minerals.

➤ **Invisiline clear aligners**

Invisalign clear aligners are movable and custom made for each person. Therefore, people can use it to do things like exercising, eating, drinking liquids, etc. These liners are also transparent. So people can easily use it.

➤ **Lingual braces**

Lingual braces are also called hidden or invisible braces. They are placed in the inner part or in other words behind the teeth. So there is no need to be embarrassed. Because no one will notice that you are undergoing orthodontic treatment.

Comparison of orthodontics in children and adults

The process of aligning teeth in pediatric and adult orthodontics is largely similar, but there are major differences. These differences are mentioned in the following line:

➤ **Shorter treatment period in children's orthodontics**

The big difference between orthodontic treatment in adults and orthodontic treatment in children is that adult teeth and jaws are fully developed. Children's teeth and jaws are still growing. Because younger patients are still in the oral development stages, it is much easier to adjust and align their teeth and jaw. As adults reach puberty, their bones harden. The tissues around the teeth in adults are placed relative to the current position of the teeth. Therefore, these issues, which are called biomechanical limitations, make the process of re-aligning the teeth much more difficult.

➤ **Overbite correction**

Malocclusion or improper bite is one of the main reasons why people go to an orthodontic specialist. If a person has an overbite, orthodontics may be a little more difficult for him.

Because over many years, one's teeth have suffered a lot of wear and tear. Therefore, the recovery period and overbite removal become more difficult for a person. On the other hand, children are still young and growing. For this reason, their teeth are not worn out with age. As a result, an orthodontist can focus care on perfecting the bite [32].

➤ **Aesthetics**

One of the main reasons many adults avoid getting braces is because they are afraid of how they will look. Because when they enter the business world. If they want to use braces, their self-confidence decreases and they feel ashamed, but this issue is less in children. Because orthodontics is more common in children. Therefore, they are more receptive to braces.

➤ **Root analysis and TMD**

There are certain vulnerabilities that adults suffer from more than children. For this reason, they challenge braces more. One of these vulnerabilities is root decay which is based on factors such as family history and oral habits. Root resorption is when the body begins to absorb the root surface of the tooth. Finally, it leaves the tooth without proper anchorage. Another injury that adults are more prone to is temporomandibular joint disorder (TMD). A patient who suffers from TMD, that is, his jaw and jaw joint suffer from problems. It is better to know that the jaw and jaw joint control the process of chewing and jaw movement. Therefore, TMD can make orthodontic treatment more difficult. This problem is much less in children. For this reason, this issue increases the advantage of orthodontics in childhood.

➤ **Pulled teeth in childhood**

Another big challenge of orthodontics in adults is that they have had their teeth pulled in the past. Therefore, these places may not be the right place for teeth to grow. For this reason, adults should take more measures to improve their orthodontic treatment process. That is, in such a situation, artificial bone needs to be added in the area where they intend to do something. Children who seek orthodontic treatment do not have this problem. Because it is easier to move and adjust their teeth compared to adults [33].

The most important factors that make the difference between orthodontics for children and adults

The most important factors that make the difference between orthodontics for children and adults, in addition to the ones examined in the introduction of each of these treatment methods, can be mentioned the following:

➤ **The effect of age**

Problems that occur in adults during orthodontics are not seen in children because of their younger age. Weakness of the jaw bone in restoration, partial gum infection and bone loss due to the hardening of the bone and the end of their growth are the most common complications of adult orthodontics compared to children. The process of moving the teeth and straightening them, as well as the loss of the jaw in adult orthodontics, will be more complicated and time-consuming due to the problems caused by aging. Therefore, age is an essential factor in creating

a difference in the process of orthodontic treatment in children and adults [34].

➤ **Teeth bite problems**

One of the common reasons people refer for orthodontic treatment is malocclusion and bite problems. The difference between dental orthodontics in children and adults in this case is that adult patients with severe overbite must pull one or more teeth to create a new space in the mouth.

➤ **Tooth extraction in adulthood and causing problems in orthodontics**

One of the things that caused a difference in dental orthodontics in children and adults is the extraction of teeth in adults before orthodontics. This disrupts the planning of the orthodontic treatment process and increases its duration.

The difference in the type of orthodontics in children and adults

Basically, for children, they use mobile orthodontics with more delicate tools and equipment. Fixed orthodontics with brackets and metal braces are mostly prescribed for adults. The reason for this choice is to take care of the child's oral and dental hygiene, as well as the convenience of the orthodontic treatment period for them [35]. Orthodontics with equipment and colored orthodontic braces are mostly considered for children [36]. Knowing the difference between orthodontics in children and adults and the side effects of orthodontic treatment for different ages helps people to choose the right time to fix the abnormality and disorder of teeth and jaw deviations [37].

CONCLUSION

Children's jaw bones are softer than adults are and the ability to move teeth is much easier. In fact, the duration of orthodontics in children is reduced due to the faster movement of teeth. On the other hand, the growth of children's jaw bones can be controlled from the very beginning. In this case, if the child has jaw abnormalities, it can be easily fixed with orthodontics, but if jaw problems are treated in adulthood, jaw surgeries must be performed in addition to orthodontics. One of the conditions for orthodontics is healthy gums. This problem does not exist in children, but it affects many adults. In this case, the adult must solve all his gum problems before orthodontics so that the orthodontic treatment is effective. These problems include gingivitis and gum infection.

Restoration of teeth in adulthood

Adult teeth have more caries than children. People who undergo orthodontic treatment in adulthood should repair and scale their teeth before orthodontics so that there is no disruption during the orthodontic period. This is despite the fact that children often go through this stage faster and do not need major repairs and nerve removal, etc. Sometimes adults who do orthodontics have lost one or more teeth. In this case, the treatment will be more difficult because the jaw bones in the place of the missing teeth will degenerate and it will be more difficult to move the teeth in this place. Therefore, the orthodontist may repair this part with the help of prosthetic bone. What a child does with orthodontics is different from what an adult

doe. In fact, many adults cannot do orthodontics well because of their social status, but orthodontics in children and teenagers not only does not make them ugly, but also becomes a fashion among many of them.

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