Early Treatment in Mixed Dentition
Orthodontists Following the Lead of General Dentists

By Brock Rondeau, DDS, IBO

Throughout the years the orthodontic profession has been divided into two different groups regarding philosophy of treatment.

1. The **North American** approach is the treatment of patients mainly in permanent dentition with the use of fixed appliances and extra-oral forces (cervical facebow headgear). This is still the technique which is being taught in the vast majority of the orthodontic graduate programs today.
2. The **European** approach is the treatment of patients in the mixed dentition utilizing removable functional appliances. Patients with abnormal habits such as thumb sucking or tongue thrusting, snoring, airway problems, mouth breathing or abnormal maxilla-mandibular (skeletal problems) are treated early in order to prevent the problems from getting worse.

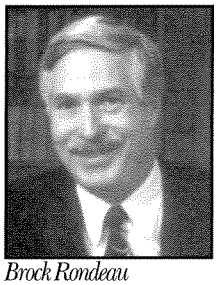
In my practice I have been utilizing functional appliances for eighteen years in mixed dentition to solve 80% of the transverse, sagittal and vertical problems. The fixed technique is merely used as a finishing appliance to properly align the teeth, and establish proper torque, tip and ideal occlusion when all the permanent teeth erupt. While the total treatment time is usually longer, the patients much prefer this technique because it means much less time involved in fixed braces. Clinicians who practice with this philosophy know that it is much easier to motivate an 8-year-old to wear a functional appliance than it is a 12-year-old to wear braces, elastics and headgear.

Charles Tweed, often called the world's greatest orthodontist, produced great results throughout his career with fixed appliances. Near the end of his career he stressed the importance of treating in mixed dentition. He stated, "In other words, knowledge will gradually replace harsh mechanics and, in the not too distant future, the vast majority of orthodontic treatment will be carried out in the mixed dentition period of growth and development and prior to the difficult age of adolescence." He made these remarks in 1963. Twenty-five years later I suggest that most orthodontists have not embellished Dr. Tweed's philosophy.

The retractive technique, which is still being taught in the majority of the orthodontic programs in North America, is primarily a bicuspid extraction technique. Proponents believe the overjet is due to a protruded maxilla and the solution is either to distalize the molars with cervical facebow headgear or appliances or extraction of the first bicuspids. This retraction of the anterior teeth frequently results in posteriorly displaced condyles which result in the compression of the nerves and blood vessels in the bilaminar zone. It also has a negative effect on the patient's profile and upper lip. They do not believe that arches should be developed, but rather lean towards extraction as a way of eliminating the crowding problem. This can lead to a constriction of the maxillary arch which subsequently prevents the mandible and condyles from assuming their correct forward position.

Proponents believe that excessive overbite is due to overerupted incisors and the solution would be to intrude the incisors with fixed mechanics. The objective of the American philosophy is to align the teeth on the lower arch and then move the upper teeth distally to achieve a proper occlusion. This retractive technique frequently impacts on the health of the TMJ negatively. The key to the European or functional philosophy is the proper development of the maxillary arch transversely and sagittally. This is necessary to accommodate all the permanent teeth and to allow the mandible and condyles to come forward to their proper position.

Two prominent orthodontic clinicians and researchers, McNamara and Moyers, made the startling revelation that 80% of Class II malocclusions have retrognathic mandibles. McNamara has further stated that less than 5% of Caucasian maxillas are truly prognathic. Joint Vibration Analysis and TMJ clinical exams routinely show disc displacement in Class II patients with retrognathic mandibles prior to treatment and normal disc/condyle relationship after functional treatment. In light of these facts, how can orthodontic practitioners continue to apply mechanics which cause retraction of the maxilla? Functional clinicians favor the advancement of the receded mandible with functional



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(orthopedic) appliances such as the Twin Block, Rick-A-Nator or Herbst Appliances for the correction of overjet problems. This forward movement of the condyle almost routinely eliminates TM dysfunction in these Class II patients.

Advocates of functional treatment believe that an excessive overbite is due to overclosed posterior vertical dimension. The problem is easily diagnosed by the presence of bruxism and numerous sore muscles upon palpation, notably the deep masseter, posterior digastric and lateral pterygoid. The functional solution would be to utilize jaw repositioning appliances to prevent the eruption of the anterior teeth and to encourage the eruption of the posterior teeth and alveolar processes. The treatment allows the posteriorly displaced condyles to move to a downward and forward position in the glenoid fossa which helps to reduce the signs and symptoms of TM dysfunction. Patients show a vast improvement in symptoms when functional appliances are utilized which develop the maxillary arch to its proper width and length and allow the mandible to be in the proper relationship with the maxilla in three dimensions, transversely, sagittally and vertically.

Two prominent orthodontic clinicians and researchers, McNamara and Moyers, made the startling revelation that 80% of Class II malocclusions have retrognathic mandibles.

In light of the above, I was most surprised recently when general dentists across the United States have received letters from orthodontists requesting that they send all their patients to the orthodontists for an orthodontic screening no later than age seven. I can only imagine the reaction of the general dentists if all the endodontists sent similar letters requesting all root canals, periodontists requesting all perio referrals, prosthodontists requesting all dentures and partials, oral surgeons all extractions, etc. What really surprises me is that most general dentists know that they are the ones treating most of the patients in mixed dentition. One only has to talk to the owners of the labs who fabricate functional appliances to confirm this fact. General and pediatric dentists use the majority of functional appliances utilized in North America today.

I have enclosed a sample letter sent by an orthodontist, Dr. Richard Wright, to a general dentist, Dr. Louis Habig, asking him for all his orthodontic referrals along with a form letter from the American Association of Orthodontists regarding their recommendation for early orthodontic screening. Similar letters have been sent by orthodontists to general dentists all across the U.S. asking for referrals. Is this letter indicative of a true paradigm shift to early treatment or is it a practice building exercise? The letter explains that the Committee on Orthodontic Care made a decision seemingly on behalf of the entire orthodontic profession. This new policy was then relayed to the dental profession by the Council on Communications.

The educational system has failed to provide our graduate dentists with adequate training in orthodontics and orthopedics...it is time for the entire profession to take this subject more seriously.

While I do not disagree with the intention of the letter, i.e. to encourage early treatment, I have a problem with the quickness of the decision. Most general dentists and pediatric dentists who provide orthodontic treatment know that they are in fact the orthodontic practitioners who treat the majority of the cases in mixed dentition. They are aware of the fact that most university undergraduate and postgraduate programs do not offer courses on early treatment of our younger patients. Therefore, if early treatment is not part of the curriculum of the majority of orthodontic programs, how can this new policy have any credibility at this point in time?

Most general dentists are also painfully aware of the fact that the majority of orthodontists have geared their practices to treating patients in the permanent dentition. They know this because on countless occasions mothers have complained about their children's orthodontic problems and have requested early treatment. If general dentists had not upgraded their orthodontic education they would then refer the patient to an orthodontist. In the majority of cases, mothers and general dentists were frustrated with the response, "No treatment is indicated at this time, the patient is too young, the malocclusion will be observed and treated only when the permanent teeth erupt." For practitioners trained with a preventive philosophy, this approach is unacceptable and illogical when statistics prove that malocclusions left untreated worsen over time.

Many dentists have thought of this as "supervised neglect." The bottom line is that mothers will not

accept the type of treatment and frequently seek out practitioners who have taken courses on early treatment. As we approach the new millennium, dentists must learn to treat these children who have malocclusions in mixed dentition.

Since 90% of the face is developed by age twelve, we must treat the children early if we want to guide and modify the growth of our younger patients. Most general dentists who have taken continuing education courses in orthodontics and orthopedics utilize a functional-orthopedic philosophy and favor two phase orthodontic treatment.

Phase 1: Mixed Dentition (Orthopedic Phase)

Thumb sucking, digital habits, anterior and lateral tongue thrusts, airway problems including mouth breathing and snoring, and jaw joint problems must be corrected early with functional appliances. Skeletal problems such as constricted maxillary or mandibular arches, retrognathic mandibles and maxillas are best treated as early as possible with functional appliances in mixed dentition.

Phase 2: Permanent Dentition (Orthodontic Phase)

Dental problems are solved with straight wire appliances in permanent dentition.

At the present time, the orthodontic profession seems divided on the Phase 2 treatment issue. Dr. David Hamilton wrote in the *American Journal of Orthodontics and Dentofacial Orthopedics*, January 1998 issue, that at the 1996 AAO Convention in Philadelphia, "several managed service organizations are advocating, because of what they consider to be circumstances adverse to the financial growth of the practice, that orthodontists do not practice two-stage treatment. A few even dictate to these enrolled orthodontists that they do not practice such treatment". Orthodontists and general dentists alike cannot compromise our principles for any managed service organization or insurance company whose primary goal is to make a profit. Our goal must be to provide the best possible service for our patients. Orthodontic practitioners must treat patients as early as the problems are diagnosed so they can utilize functional appliances to help modify the growth and to correct the skeletal and facial dysplasia that are present.

In 1985 the *American Journal of Orthodontics* changed its name to the *American Journal of Orthodontics and Dentofacial Orthopedics*. In 1994, nine years later, the American Association of Orthodontics changed their name to the American Association of Orthodontists and Dentofacial Orthopedics. I think it is time that the Association takes its name seriously and starts to stress the importance of Phase 1 treatment for dentofacial orthopedic problems. A letter from the Committee on Orthodontic Care is a step in the right direction but more than this is necessary in order for the orthodontic profession to have increased credibility. The education system for orthodontists, general and pediatric dentists alike, with few exceptions, is totally inadequate as part of our formal dental and orthodontic education. Most orthodontic graduate programs do not stress early treatment and consequently, since orthodontists are teaching general dentists, the same lack of information continues. I think early treatment should be added to every dental and orthodon-tic graduate program. Only in this way will the children who need the treatment be assured of receiving same from the general, pediatric and orthodontic practitioners.

At the present time, most of the functional orthopedic appliances are being fabricated by general dentists. Many general dentists have taken courses in functional appliances because they want to help their patients and were frustrated by the lack of interest in the majority of the orthodontic profession in helping these children. I have been teaching courses on the use of functional appliances for the past eighteen years and have not yet met a general dentist who thought they received adequate training in early treatment. I would submit that the educational system has failed to provide our graduate dentists with adequate training in orthodontics and orthopedics. When you think how many children need orthodontic treatment, it is time for the entire profession to take this subject more seriously.

Perhaps at this time it might be prudent to itemize some of the indications for early treatment.

1. Constricted maxillary arch with resultant unilateral or bilateral crossbite. These arches must be developed to their normal width in order to ensure that:
   a) There will be adequate space for the eruption of all the permanent teeth.
   b) Allow room to advance the mandible in cases of Class II skeletal with retrognathic mandibles. Patients and parents much prefer the use of functional appliances such as the Twin Block, Rick-A-Nator and Herbst Appliances, to advance the mandible non-surgically in mixed dentition rather than delay treatment until permanent dentition and have it treated surgically.
   c) When the maxilla expands the palate drops and this increases the size of the nasal cavity which helps encourage nasal breathing.
   d) When the maxilla expands this helps provide more space for the tongue which helps eliminate speech problems.
   e) The development of the maxilla encourages the patient to have a broad smile.
   f) Some patients with unilateral posterior crossbites have facial asymmetries due to a shifting

of the mandible to one side during closure. It is critical that the crossbite be corrected as early as possible in order to eliminate this facial asymmetry.

g) The proper development of the maxillary arch allows the mandible to assume its correct position and allows the condyles to move downward and forward. This helps eliminate the signs and symptoms of TM dysfunction. Clinicians who treat and monitor the health of the TMJ routinely find that the proper development of the maxillary arch is one of the main keys to TMJ health.

Treatment
Removable: Schwarz Appliance; Fixed: Maxillary Banded Hyrax, Williams MAX 2000

2. Anterior crossbites must be eliminated as soon as possible. If an anterior tooth is in crossbite this can result in the mandible being locked in an unfavorable position which adversely affects the occlusion as well as the health of the TMJ. Parents are most concerned about the appearance of these teeth as one is frequently longer than the other and at a different height. Also, the problem of traumatic occlusion and gingival recession must be addressed.

Treatment
Removable: Anterior Sagittal, Schwarz Appliance with Micro Screw

3. Severely protruding maxillary teeth need treatment at an early age as they are prone to injury. They cause entrapment of the lower lip and a lingual displacement of the mandibular incisors. To prevent possible fracturing, these teeth must be retracted with an appliance with an anterior labial bow.

Treatment
Schwarz Appliance with Anterior Labial Bow

4. Ankylosed teeth must be extracted soon after the corresponding permanent tooth on the opposite side of the mouth has erupted. Do not treat too early or it will result in a loss of arch length. After the ankylosed tooth is extracted uncover the permanent bicuspid tooth underneath which will help it erupt into proper position.

5. Anterior open bite caused by a digital habit such as thumb sucking must be corrected as early as possible. These habits are much harder to correct when the patient has permanent teeth and much easier to correct in mixed dentition when the children are much more cooperative.

Treatment
Removable: Schwarz Appliance with Thumb Rake; Fixed: Dillingham Appliance with Thumb Rake

6. Ectopic eruption must be corrected early. Second primary molars must be extracted early in order to allow the first permanent molars to erupt. Then the first permanent molars must be distalized prior to the eruption of the second molars. Failure to treat early can result in a significant loss of arch length for the permanent dentition.

Treatment
Removable: Posterior Sagittal
Fixed:Williams D MAX 2000

7. Class II Div 2 cases where the maxillary incisors are lingually inclined. These cases must be treated early since the mandible is being held in a retrusive position by the incisors in linguoversion. The majority of these children have some signs and symptoms of TM dysfunction due to the resultant posteriorly displaced condyles. Clinicians must use appropriate appliances designed to torque the incisors so that the mandible can assume its correct forward position. To minimize the affects on the profile as well as the TMJ, these cases must be treated as early as possible.

Treatment
Removable: Three Screw Anterior Sagittal; Fixed: Williams SAG 2000

8. Class III retrognathic maxilla cases must be treated in mixed dentition in order to minimize or prevent the possibility of orthognathic surgery. In most cases, if the maxillary arches are developed laterally as well as anteriorly, these cases can be successfully treated non-surgically.

Treatment
Removable: Anterior Sagittal with or without Reverse Headgear; Fixed: Maxillary Bonded Hyrax with Reverse Headgear, Maxillary Banded Hyrax, Williams SAG 2000

9. Primary molar buildups with composite can help eliminate ear infections and the incidence of otitis media in children. This is particularly effective in cases where the patient has a deep overbite. The procedure is painless as the patient does not require a local anesthetic which is also a post operative concern in these very young children. Most parents agree that this simple procedure is safer, easier and less costly than long term antiobiotics or outpatient surgery (myringotomies or tubes in the ear). The primary molar buildups on the lower first and second primary molars not only corrects the dental malocclusion which is the deep overbite but it also helps to prevent and cure the common condition in young children known as otitis media.

10. Snoring and obstructive sleep apnea are problems which affect a large part of the population,

especially after age forty. Snoring is a social problem, particularly for the spouse, which occurs when the airway is partially blocked. Apnea occurs when the patient stops breathing for longer than ten seconds. Obstructive sleep apnea occurs when the patient has more than thirty episodes of apnea during a seven hour sleep cycle. This happens as a result of the airway becoming completely blocked by the tongue. The majority of these cases can be treated with dental appliances that function to reposition the mandible forward which helps move the tongue forward and opens up the airway. Most cases can be treated in the mixed dentition stage by utilizing functional appliances such as the Twin Block, Rick-A-Nator or Herbst Appliances to reposition the lower jaw and tongue forward.

Obstructive sleep apnea is a serious medical condition which results in a decrease of oxygen, an increase in blood pressure and an increase in the incidence of heart disease and strokes. It is imperative that the dental profession expand their role to include treating children in the mixed dentition who have Class II skeletal problems involving a normal maxilla and retrognathic mandible in order to not only correct the obvious malocclusion but also to prevent the future onset of snoring and obstructive sleep apnea.

CONCLUSION

I think the role of the specialist in the health care field is to treat the difficult cases. This is the universal role in all of medicine and dentistry. The family medical doctor handles most of the routine problems but refers the difficult cases to the gynecologist, cardiologist, E.N.T. specialist, etc. One of the roles of the medical or dental specialist is to help educate the undergraduate dental and medical students on how to be competent to treat the simple cases. Dental specialists taught undergraduate dentists to do root canals, crowns, bridges, perio surgery, complete dentures, partials, etc. Dentists graduated with a basic knowledge on how to perform certain basic procedures so they could make a living practicing dentistry.

The only exception to this was orthodontics. General dentists were not given enough information to treat even the simplest cases. Instead, general dentists were encouraged in dental school to refer all the cases to the orthodontic specialist. Dr. Mike Dittola, a practice management consultant from California, made an interesting comment while attending my orthodontic course in Toronto last year. He said, "The dental profession should consider a class action lawsuit against the orthodontic profession for what they failed to teach us in dental school. If the other specialists, including the prosthodontists, endodontists, periodontists, oral surgeons, etc. had taught in the same way, we would be incapable of practicing dentistry". Dr. Dittola is particularly upset with the lack of diagnostic skills in the area of orthodontics that he and other general dentists received in dental school. I have never been in favor of using the courts to settle our differences within our profession, but I think the time is long overdue for the orthodontists to rethink their position on their role in educating the general dentist to treat the simple orthodontic cases.

Most general dentists who offer orthodontic services to their patients are astonished at the letters (copies enclosed) requesting that general dentists refer all of their orthodontic patients to the orthodontists for an orthodontic screening no later than seven years of age. This is not ethically or morally correct. I do not see the other dental specialists, i.e. endodontists, prosthodontists, oral surgeons, periodontists and pediatric dentists, asking for referrals of all patients. It is unethical for the following reasons:

1. The majority of orthodontists failed to train the general dentist in dental school to perform orthodontics or orthopedics competently.
2. Orthodontists should rethink their philosophy of treating patients by aligning themselves with the other specialists in medicine and dentistry and treat only the complex cases, thereby encouraging general dentists to treat the simple cases.
3. The general and pediatric dentists have taken courses on functional appliances so they can treat their younger patients with functional and skeletal problems in mixed dentition. General dentists who have taken these courses are competent to treat the simple cases and they resent the fact that this is not recognized by the orthodontic profession.
4. The general dentist knows that the emphasis in an orthodontist's education has always been fixed treatment in permanent dentition. Therefore, how could the entire profession become educated so quickly in terms of early treatment and functional appliances when Dr. Peter Sinclair, in the January 1993 issue of the *Journal of Clinical Orthodontics*, stated that the orthodontists interviewed

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said they used functional appliances in 5 to 10% of their cases?

It is my opinion that the general dentist, at this time, is the treatment specialist of the mixed dentition. Therefore, I think the general dentist should continue to take courses and treat the simple cases in mixed dentition. Eighty percent of the Class II cases involving underdeveloped mandibles can be treated orthopedically by the general dentist in mixed dentition utilizing the Twin Block, Rick-A-Nator and Herbst Appliances. Cases that cannot be corrected orthopedically should be referred to the orthodontist for surgical correction. Parents and patients alike much prefer the non-surgical approach using functional appliances. My success rate with treatment of Class II skeletal problems orthopedically with functional appliances is over 95%.

No one ever said we live in a perfect world and indeed, based on the above, you can see we do not. To solve a problem you must first identify it. Based on that, I think orthodontists and general dentists must work together to correct these problems. The basic problem lies in our educational system. More emphasis must be placed on the treatment of our children at a younger age so we can correct the majority of the transverse, sagittal and vertical problems in the mixed dentition stage. It seems that general dentists as well as orthodontic graduate students feel that their education is inadequate in the area of orthopedics. For the good of our younger patients this situation must be rectified. At the GORP Meeting at the University of Michigan this year, the orthodontic residents were concerned that they were not receiving adequate information in their graduate program about early treatment and functional appliances. Hopefully, the academics will respond accordingly and change their curriculum to include more information on two phase orthodontic treatment.

Insurance companies are putting more pressure on the dental profession to contain costs and they are also reducing benefits at an alarming rate. Orthopedic treatment in mixed dentition can significantly reduce the costs for insurance companies because it reduces the severity of the malocclusion and shortens the treatment time in fixed braces. The use of functional appliances also reduces the need for extraction and surgery which again will benefit the patients as well as reduce costs for the insurance companies.

General dentists, faced with increasing competition from managed care groups and insurance companies reducing benefits, must look for alternate sources of income. According to the Burlington Growth Study, Ontario, Canada, 75% of children, age 12, have some form of malocclusion. Obviously, there is a great need to help treat the younger patients. Dr. Howard Farran, Phoenix, Arizona, one of the top management consultants in the world, has said on numerous occasions that general dentists must get into orthodontics so they can expand their practices and fill their appointment books. The other important factor that I have seen over the past 18 years of teaching is that dentists involved in helping their younger patients develop normal profiles, broad smiles and straight teeth have a tremendous sense of accomplishment and personal satisfaction from their practices.

My intention in writing this article was not to solely criticize the orthodontic profession but merely to point out some of the problems which are apparent in our educational system. If someone does not address this in a somewhat dramatic way, things have a way of continuing along the same path. During my years of teaching, which gives me an opportunity of interrelating with general dentists and orthodontists all over the world, I am encouraged by the following positive steps: (1) The trend towards the treatment of children in mixed dentition, evident by the fact that at least 30% of the North American orthodontists are using functional appliances; (2) The fact that the orthodontic graduate students are beginning to complain about their lack of adequate training in this area; and (3) The letter sent to general dentists by the American Association of Orthodontists regarding their recent commitment to early treatment.

As I mentioned earlier, I would have preferred a different approach with something to the effect that the American Association of Orthodontists would like to dedicate themselves to early treatment and will work with the general dentists regarding the well being of our children. I still think orthodontists have to come to grips with the fact that they cannot expect the general dentist to refer all the cases. I would like to see our profession move in a new direction of cooperation between orthodontists and general dentists. It would be nice to see a dialogue established between the AAO and the IAO to help solve some of these problems. The IAO (International Association for Orthodontics), an organization comprised of mainly general dentists who perform orthodontic services, has been around since 1961. During the last 37 years I know of no such meaningful discussion with the AAO, representing the orthodontists' interests and the IAO, representing the general practitioners' interests. The time is long overdue for both organizations to discuss these issues so that the quality of the orthodontic services being provided by all orthodontic practitioners, including general dentists, pediatric dentists and orthodontists, must be improved. Perhaps it is time to forget about egos and remember "the enemy is malocclusion not each other".

COURTNEY
Female, Age 5

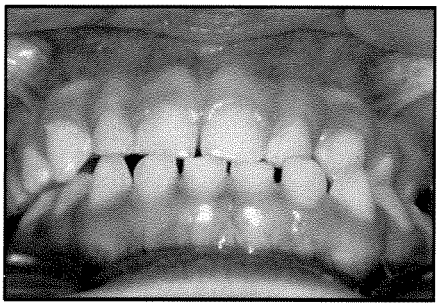
Courtney is a 5-year-old girl with a unilateral crossbite on the left side. Her mandible is shifted left 3 mm. causing a facial asymmetry. While her crossbite appears unilateral, it is in fact a bilateral problem which requires a correction of the skeletal problem, i.e. the constricted maxillary

Initial Facial Asymmetry
Mandible Shifted Left

arch. When the mandible shifts to the left, this results in the condyle on the right side to become anteriorly displaced and the condyle on the left side posteriorly displaced. The anteriorly positioned condyle moves forward in the glenoid fossa and new bone is deposited on the head of the condyle and therefore proceeds to increase in length. This is similar to what happens when jaw repositioning (functional) appliances are utilized in growing individuals. The posteriorly displaced condyle on the left side can, in time, undergo osteoarthritic changes and actually flattens and becomes shorter. It has been well documented in the literature that a posteriorly displaced condyle can cause numerous signs and symptoms of TM dysfunction. Therefore, in order to keep our younger patients healthy, we must treat this problem as early as possible.

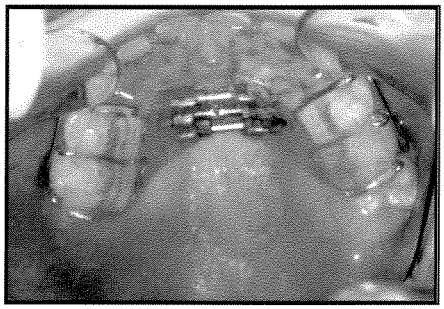
The appliance of choice would be a removable upper Schwarz Appliance with a single midline expansion screw to orthopedically expand the maxillary arch by widening the mid palatal suture which fills in with new bone. The development of the upper arch to its normal shape and size makes more room for all the permanent teeth and reduces the need for extraction of permanent teeth. The Schwarz Appliance has acrylic pads covering the occlusal surfaces of the posterior teeth which cancels the occlusal interferences and allows for a true orthopedic expansion. During active treatment the midline screw is adjusted with a special key twice per week. Active treatment with the Schwarz Appliance is approximately six months and the patient wears the appliance for another six months as a retainer to prevent relapse.

An important part of the success of treatment would be the restoration of proper function including nasal

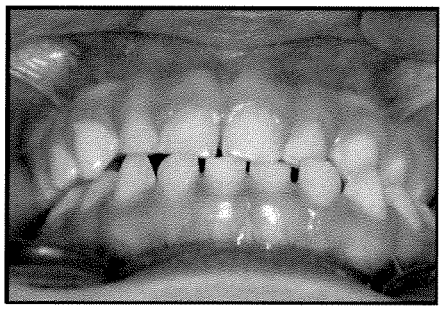


Initial Frontal
Left Side in Crossbite

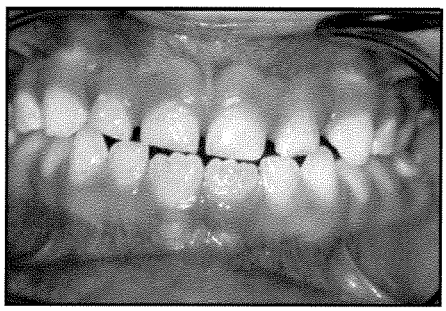
Right Lateral
Upper Schwarz Appliance



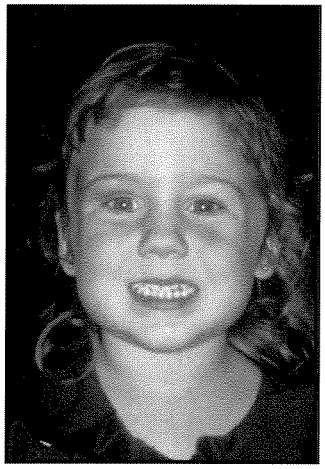
Occlusal View
Upper Schwarz Appliance



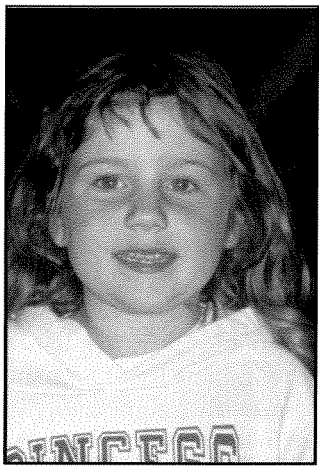
Initial Frontal
Mandible Shifted Left 3 mm.



Final Frontal
Midlines Normal



Initial Facial Asymmetry
Mandible Shifted Left



Final Frontal
Skeletal Midlines Normal

breathing, proper swallowing, normal lip seal and elimination of various habits. After the correction of the skeletal problem, i.e. the constricted maxillary arch, the condyles seem to center themselves in the glenoid fossa and the skeletal midlines become realigned. This treatment with the Schwarz Appliance corrects the facial asymmetry, skeletal crossbite, and TM dysfunction in less than six months. This is an easy appliance for the general dentist to use and one that most younger patients will readily accept. However, for those patients where cooperation may be a problem, there are some excellent fixed arch development appliances that are available.

Problem
Constricted Maxillary Arch; Skeletal Crossbite Left Side; Facial Asymmetry

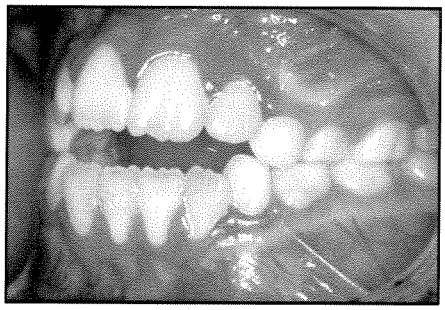
Solution
Maxillary Schwarz Appliance; Occlusal Pads; Adjust Midline Screw Twice Per Week; Active Treatment (6 Months); Retention (6 Months)

DANA
Female, Age 8

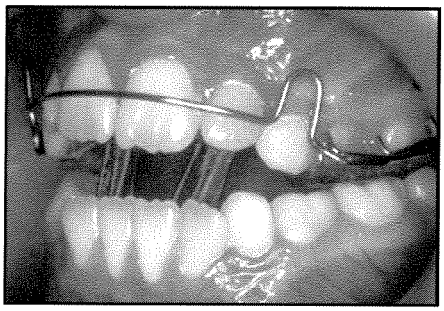
Dana is an 8-year-old girl with a 4 mm. anterior open bite, thumb sucking habit and a constricted maxillary arch. She also had a severe mouth breathing problem which necessitated the removal of her adenoids to ensure a patent airway. In order to further assist the nasal breathing, it was necessary to utilize a Maxillary Schwarz Appliance with a midline screw to expand her upper arch and increase the size of the nasal cavity. During active treatment the midline screw was adjusted twice per week. The development of the upper arch to its normal width made more room for the tongue which helped to encourage normal tongue function. A thumb rake was placed on the upper Schwarz Appliance in order to eliminate the thumb sucking habit. Since the tongue habit had resulted in the anterior movement of the maxillary incisors, a labial bow was utilized to retract these incisors after the expansion was accomplished.

Active treatment with the removable Schwarz Appliance with posterior occlusal pads and thumb rake was 6 months and another 6 months with no adjustments of the midline screw. During the 6 month retention period, the thumb rake was removed. After two years almost all of the permanent teeth have erupted into normal position and the 4 mm. anterior open bite has been completely corrected.

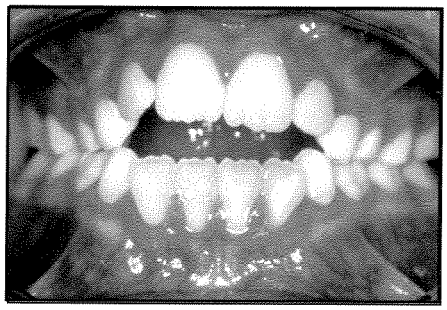
Clinicians must realize the importance of correcting these oral habits early when the patient is more cooperative. It is much easier to motivate an 8-year-old to wear a Schwarz Appliance with a thumb rake than a 13-year-old with erupted permanent teeth. The earlier you can establish normal functions including nasal breathing, proper swallowing, elimination of a thumb sucking habit, proper speech and normal lip seal, the more stable results will be obtained with your patients.



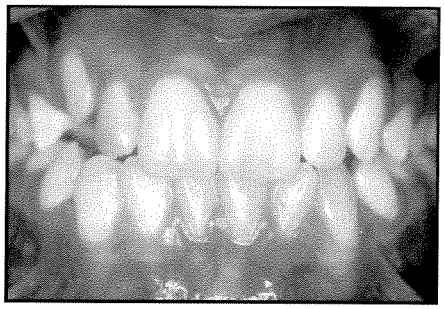
Initial Left Lateral
4 mm. Anterior Open Bite



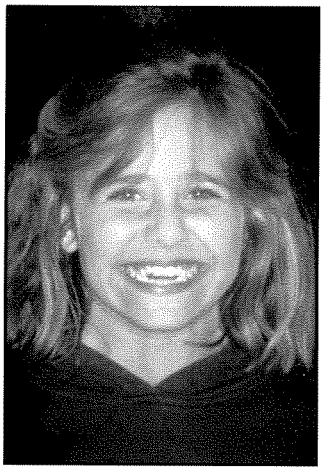
Maxillary Schwarz Appliance
Thumb Rake



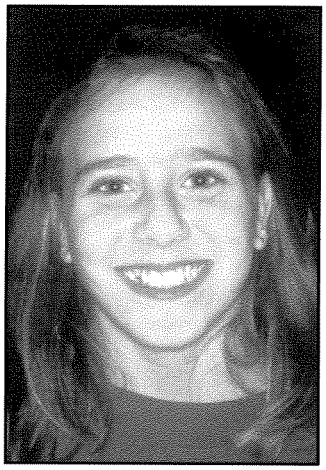
Initial Frontal
4 mm. Anterior Open Bite



Progress Frontal
Normal Overbite Two Years Later



Initial Frontal
Anterior Open Bite



Progress Frontal
Normal Overbite Two Years Later

Parents do not want to delay treatment of their children. The general dentist is ideally suited to treat these patients since they are the ones making the diagnosis and they are trained with a preventive, interceptive philosophy. When you can intercept and solve the problems early and relatively inexpensively, this gives general dentists a great deal of satisfaction and helps the growth of the practice.

Dana's treatment is proceeding so well that she may not even need Phase 2 treatment (fixed braces). This is something that many parents appreciate. Not only did the general dentist intervene early and correct the malocclusion, but now possibly the use of fixed appliances may either be minimized or eliminated.

Problem

Anterior Open Bite; Thumb Sucking Habit; Constricted Maxillary Arch

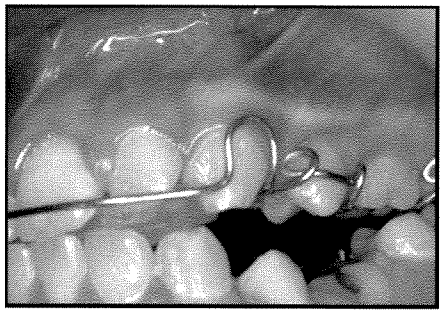
Solution

Removable Schwarz Appliance Thumb Rake; Adjust Midline Screw Twice Per Week; Active Treatment (6 Months); Retention (6 Months)

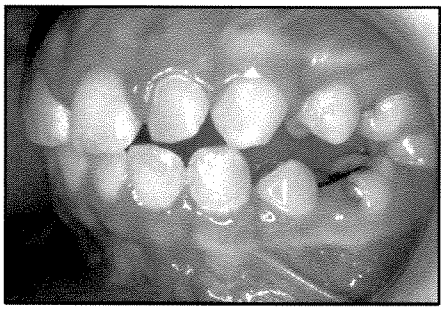
SHAYNA
Female, Age 10

Shayna is a 10-year-old girl with a 7 mm. overjet and a 4 mm. overbite, Class II skeletal, normal maxilla and retrognathic mandible. The treatment of choice for retruded mandibles in mixed dentition with moderate to large overjets is the Twin Block Appliance. The blocks of the upper and lower appliances were 6 mm. thick and interlock at 70° to keep the mandible in a forward position. Normal overjet and a Class I molar relationship are achieved after 7 months wearing the Twin Block. When this jaw repositioning appliance is utilized while the patient is actively growing, the mandible comes forward to its proper position in 7 to 9 months routinely. The overbite is corrected by grinding the upper block to allow for the passive eruption of the lower first molars.

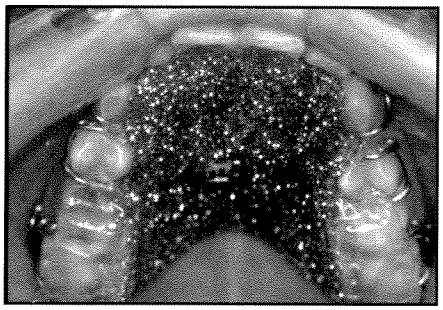
After normal overjet, normal overbite and a Class I molar relationship have been achieved with the Twin Block, a Twin Block II Appliance is utilized for 6 months to prevent a relapse and allow for the eruption of the bicuspids. When treatment is



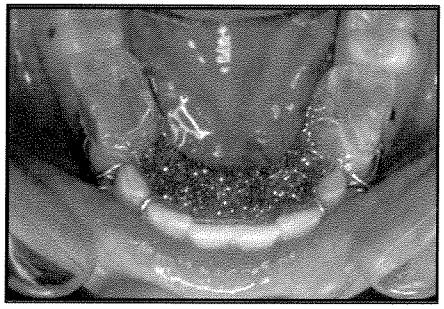
Initial Left Lateral
Overjet 7 mm. Overbite 4 mm.
Class II Molar



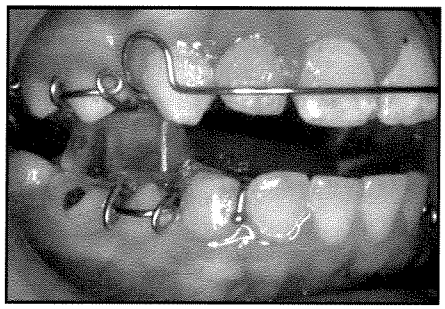
Progress Left Lateral
Overjet 1 mm. Overbite 1 mm.
Class I Molar



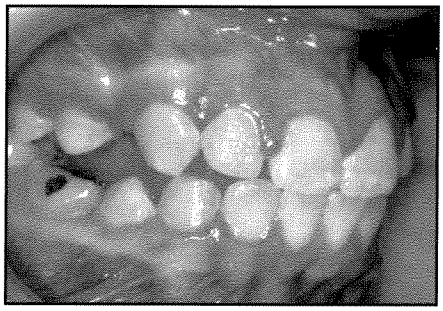
Upper Block



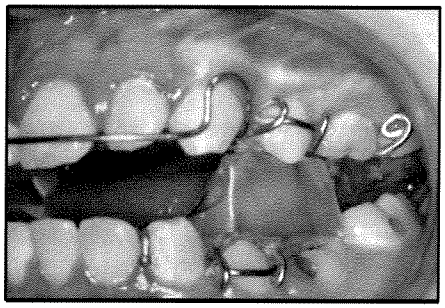
Lower Block



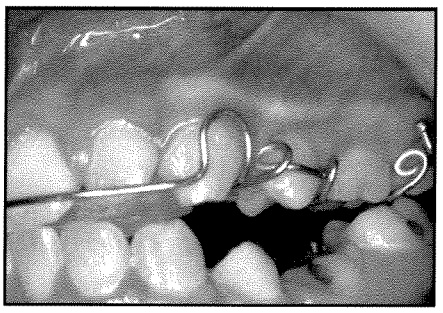
Twin Block
Grind Maxillary Block
Erupt Lower 1st Molars



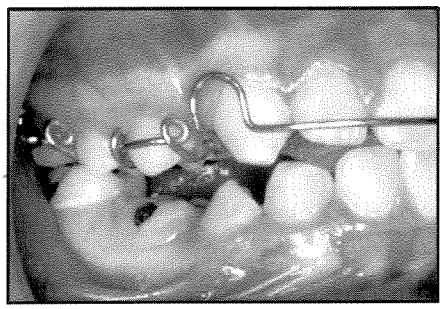
After 7 Months Twin Block
Normal Overjet, Overbite



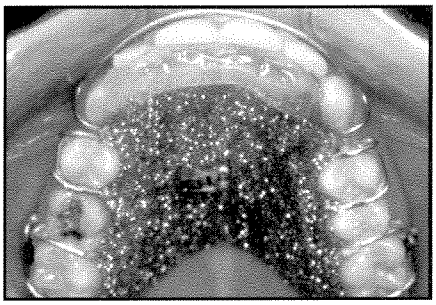
Twin Block 7 Months
Erupt Lower 1st Molars



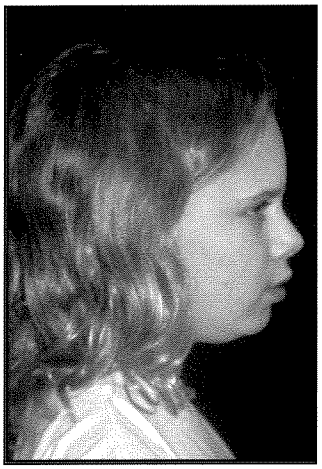
Twin Block II
Hold Mandible Forward
Anterior Repositioning Ramp



Twin Block II
6 Months
Allow Bicuspids to Erupt



Twin Block II
Anterior Repositioning Ramp



Initial Profile
Before Twin Block

Final Profile
After Twin Block 7 Months

initiated in mixed dentition, 80% of the transverse (arch width), sagittal (overjet), and vertical (overbite) problems can be corrected with functional appliances. The photos clearly show a dramatic improvement in the profile as a result of the utilization of the Twin Block Appliance.

Problem
Class II Skeletal; Normal Maxilla; Retrognathic Mandible

Solution
Twin Block (7 Months); Twin Block II (6 Months)

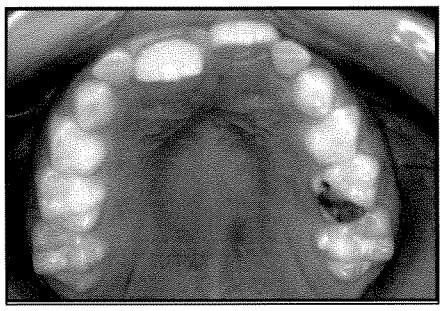
LAURA
Female, Age 7

Laura is a 7-year-old girl with a constricted maxillary arch, anterior crossbite and deep overbite with the mandible shifted slightly to the right. The anterior crossbite has locked the mandible in an unfavorable position. The mother was concerned because of the poor esthetics as a result of one central incisor appearing to be longer than the other. Obviously, the earlier this is corrected you reduce the incidence of permanent facial asymmetry, TM dysfunction and recession of the lower incisors aggravated by traumatic occlusion.

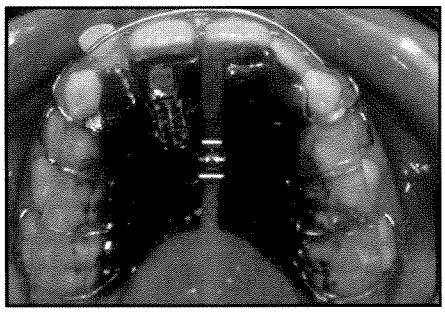
The appliance of choice was a Maxillary Schwarz Appliance with one midline screw, anterior labial bow and one micro screw. Due to the anterior crossbite the appliance is constructed with acrylic pads covering the occlusal surfaces of the posterior teeth which opens the bite and allows for the correction of the anterior crossbite. The first priority is to correct the anterior crossbite which is accomplished by activating the micro screw one turn twice per week. This screw can only be activated 4 mm. so this can be accomplished in 2 to 3 months. The labial bow is used to help align the maxillary incisors once the upper right central incisor has been moved labially.

After the anterior crossbite has been corrected, the midline screw is activated in an effort to develop the maxillary arch to its proper width. Laura and her mother were extremely pleased with the esthetic results we were able to obtain once the anterior crossbite had been corrected. Both maxillary central incisors were leveled and were the same length. It should be noted that this was accomplished with just the Schwarz Appliance in less than 6 months. The skeletal midline also corrected which helped prevent any future facial asymmetries.

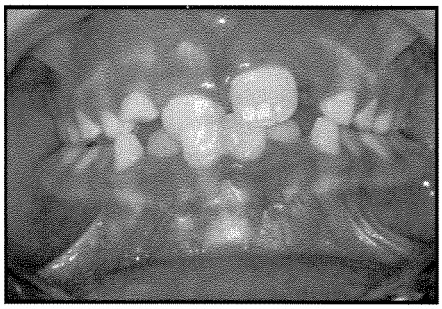
A second appliance was then utilized called the Rick-A-Nator to help correct the deep overbite. This fixed-functional appliance consists of an anterior bite plate lingual to the six anteriors connected to the first permanent molars by two .045 connector wires. The Rick-A-Nator helped to correct the deep overbite by preventing the eruption of the anterior teeth. The anterior bite plate on the Rick-A-Nator



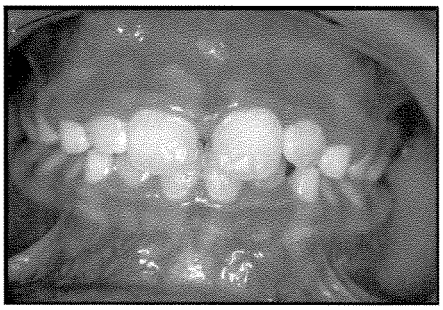
Occlusal View
Right Central Linguoversion



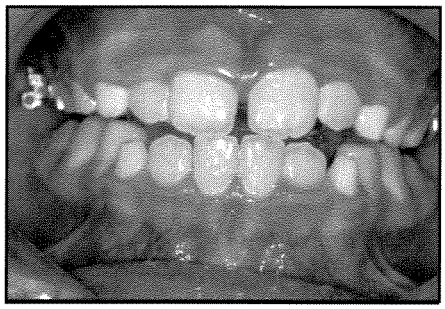
Schwarz Appliance
Midline Micro Screw Activated 4 mm.



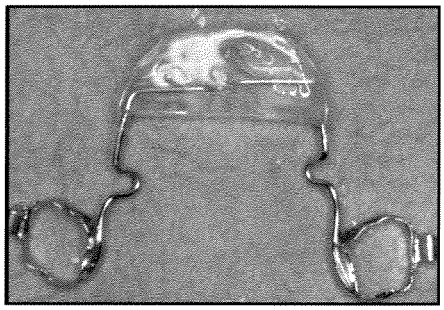
Initial Frontal
Anterior Crossbite



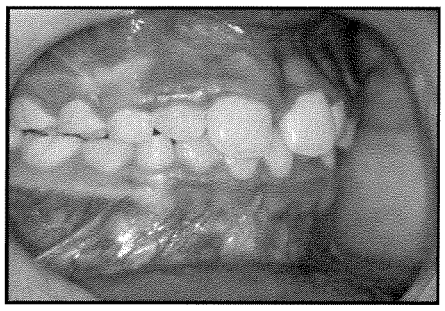
9 Months Later
Crossbite Corrected



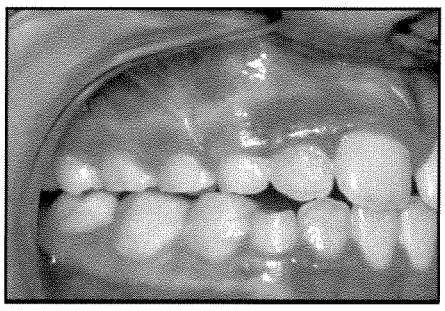
Rick-A-Nator
Composite Buildups
Lower Primary Molars



Rick-A-Nator
Anterior Bite Plate

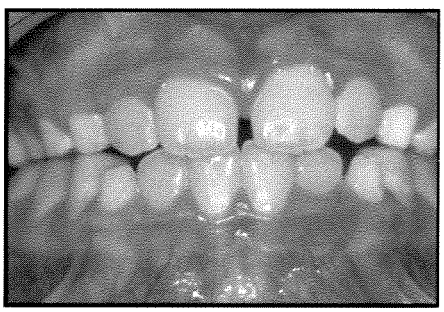


After Schwarz Appliance
Deep Overbite



After Rick-A-Nator
After Composite Buildups
Normal Overbite

Initial Frontal
Anterior Crossbite
Deep Overbite



Progress Frontal
Crossbite Corrected
Normal Overbite

was then transformed into an incisal ramp by utilizing light cured Triad. Laura was asked to bite forward into a position where the first permanent molars were in a Class I relationship and the overjet and overbite were each 1 mm. Once the correct position of the mandible in relation to the maxilla was established, the Rick-A-Nator was cemented into place.

The mandibular second primary molars were built up with composite so there was contact with the maxillary primary molars. The mandibular first permanent molars then passively erupted to their proper level within 4 months. The primary molar buildups are necessary to give the patient a proper occlusion so they can chew their food properly. If you just use the Rick-A-Nator without the composite buildups they will not be able to eat properly.

The final photos show a correction of the malocclusion with just two simple orthopedic appliances. Eighty percent of the transverse, sagittal and vertical problems are solved with orthopedic appliances in mixed dentition. The Schwarz Appliance and the Rick-A-Nator successfully corrected the anterior crossbite, constricted maxillary arch, facial asymmetry, and the deep overbite in approximately 18 months. Laura had no problem wearing either the Schwarz Appliance or the Rick-A-Nator and she much preferred to have most of her problem solved in mixed dentition. This meant that when her permanent teeth erupt her treatment time in fixed braces (straight wire) will be greatly reduced.

Problem
Anterior Crossbite; Constricted Maxillary Arch; Deep Overbite

Solution
Maxillary Schwarz Appliance (9 Months); Rick-A-Nator (6 Months); Composite Buildups; Mandibular Second Primary Molars

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