Shailesh Deshmukh: On behalf of the Editor and the members of the Indian Orthodontic Society, I extend my greetings to you from India. May I begin by asking you to tell us about your general educational background and your education in orthodontics?

James McNamara: Thank you for the invitation to be interviewed. I began my collegiate education at the University of California Berkeley, where I majored in Speech (today called Forensics). I then attended the School of Dentistry at the University of California San Francisco, where I received my dental education and my specialty education in orthodontics. In 1968, I traveled 2000 miles east to Ann Arbor and began my doctoral studies in the Department of Anatomy at the University of Michigan. I also became affiliated with the Center for Human Growth and Development, an interdisciplinary research unit on the Ann Arbor campus.

My dissertation concerned the adaptation of the temporomandibular joints in rhesus monkeys, a study completed in 1972, after which I was appointed to the University of Michigan faculty. I have been there ever since. In addition to my current appointments in the School of Dentistry, the School of Medicine, and the Center for Human Growth and Development, I have maintained a part-time private practice in Ann Arbor. Thus, I have both academic and clinical perspectives concerning orthodontics and dentofacial orthopedics.

Shailesh Deshmukh: You have been an advocate of early orthodontic and orthopedic treatment for much of your professional career. Today, what are the most important issues related to early treatment?

James McNamara: In my opinion, perhaps the most important issue today is treatment timing. With the recent emphasis on "evidence-based" treatments in both medicine and dentistry, we now are gaining an appreciation concerning the nature of the treatment effects produced by specific protocols in patient of varying maturational levels. We are moving toward a better understanding as to the appropriate timing of orthodontic and orthopedic intervention depending on the clinical condition.

In recent years, there has been considerable discussion among clinicians and researchers alike concerning the appropriate timing of intervention in patients who have Class II malocclusions, as has been evidenced by the numerous discussions of the randomized clinical trials of Class II patients funded by the US National Institutes of Health (e.g., North Carolina, Florida). But the issue of "early treatment" is far broader than simply arguing about whether a Class II patient is better treated in one or two phases. A variety of other malocclusions also must be considered within this topic, including the management of patients with Class III malocclusions, those with open and deep bites, and the many patients with discrepancies between the size of the teeth and size of the bony bases (the latter comprise about 60% of the patients in our private practice).

Shailesh Deshmukh: What are your views about the extent to which a clinician can alter the growth of the face?

James McNamara: In my mind, the easiest way for a clinician to alter the growth of the face is in the transverse dimension, orthopedically in the maxilla, dentally in the mandible. Rapid maxillary expansion (RME; Fig. 1) has been shown to be an extremely efficient and effective way of widening the maxillary bony base. In the lower arch, however, there is no
mid-mandibular suture—so it is virtually impossible to produce orthopedic change in the mandible other than in combination with distraction osteogenesis at the midline. The changes in the lower arch are more dentoalveolar in nature, such as those resulting from the use of a removable lower Schwarz appliance (Fig. 2).

As far as sagittal change is concerned, I think there is an overwhelming body of experimental and clinical evidence that mandibular length can be increased over the short-term in comparison to untreated Class II controls, using a variety of functional orthopedic appliances. The long-term effect of bringing the mandible forward is much more uncertain at this time, and most recent research has shown that the long-term mandibular skeletal effect may be limited to 1-2 mm over what would have occurred without treatment. In the midface, restriction of the forward movement of the maxilla and maxillary dentition in Class II patients has been well-documented for over 50 years.

Regarding protraction of the maxilla with a facial mask in Class III patients (Fig. 3), most clinical studies have shown that the amount of true maxillary skeletal protraction is only 1-2 mm (or perhaps 3 mm at most) over what would occur during normal growth. Increased forward protraction amounts may be produced if the facial mask is attached to dental implants or if microimplants or miniscrews are used for skeletal anchorage.

Most orthodontists believe that the vertical dimension is the dimension that is the most difficult to correct therapeutically, and that certainly has been my experience. In a growing patient, increasing a short lower facial height is accomplished most effectively with an appliance such as the Twin Block or the FR-2 of Fränkel. In the long-face patient, controlling the vertical dimension has been particularly challenging. For example, a recent study by our research group evaluated modification in growth following the use of a bonded rapid maxillary expander and vertical-pull chin cup (Fig. 4). The effect of the vertical-pull chin cup existed only in the mixed dentition and not so much in the permanent dentition.

Shailesh Deshmukh: In Class III cases in the deciduous or early mixed dentition, what cephalometric
parameters do you use to differentiate among a true Class III, true developing Class III, and a dentoalveolar Class III?

James McNamara: I do not usually perform a detailed analysis with those questions in mind. Our approach to Class III treatment is primarily through the use of a bonded expander and an orthopedic facial mask. Typically, the first appliance that we use is the acrylic splint rapid maxillary expander (Fig 1). In many patients (perhaps one-third of mixed dentition Class III patients), we observe a spontaneous correction of the Class III or Class III tendency toward Class I simply by expanding the maxilla. If further intervention is necessary, then we will incorporate an orthopedic facial mask (Fig. 3) in to the treatment protocol. Any time a patient has a Class III molar relationship and we use this protocol, first any CO-CR discrepancy is eliminated just by placing the face mask; so we do not try to make the differentiation between those three conditions you asked about, in that all three conditions are managed by the same treatment protocol.

Shailesh Deshmukh: Do you still use the FR-3 appliance of Fränkel? You previously have recommended the use of the FR 3, especially in maxillary retrognathic cases. What are your contemporary views on its use?

James McNamara: Currently, I actually use more FR-3 appliances (Fig 5) than I do FR-2s (Fig. 6). Today, the FR-3 usually serves as a retainer, rather than as a primary treatment appliance. The FR-3 is an appliance that has vestibular shields and also upper labial pads that free the maxilla from the forces of the associated musculature. The FR-3 has very much of the same treatment effect as a facial mask-expander combination, but the treatment effects take much longer to occur in FR-3 therapy. In any patient about whom I am suspicious about a strong tendency for relapse towards a Class III malocclusion after facial mask therapy, we will use the FR-3 as a retainer to be worn at night and around the house during the day. This approach of using the FR-3 as a retainer after successful facial mask therapy
seems to be a reasonable way of incorporating this type of Fränkel appliance into our overall treatment scheme.

Shailesh Deshmukh: Tell us more about the acrylic splint expander used in combination with the orthopedic facial mask. Can you elaborate on the use of this treatment protocol in patients with only dentoalveolar Class III or mandibular projection cases?

James McNamara: We use the same basic protocol regardless of the etiology of the problem. When I first heard Professor Henri Petit (then of Baylor University in Dallas, Texas) speak about the facial mask in 1981, I was somewhat critical of his presentation because he did not differentiate among the various types of Class III malocclusions according to their etiology. I soon realized that the face mask - expander combination is very effective regardless of the underlying etiology of the Class III problem. I have use essentially the same protocol for the last 25 years, starting with the bonded expander. Typically we will deliver the expander and have the patient expand the appliance 28 times. If we need more turns, the patient is instructed to do so; then we will deliver the face mask if the underlying Class III malocclusion has not corrected spontaneously.

We usually recommend that the timing of facial mask therapy correspond to the eruption of the maxillary permanent central incisors. I do not like to start much earlier than that because I want to make sure that there is a maximum vertical overlap of the upper and lower central incisors at the end of treatment. The establishment of maximum incisor overlap is critical in maintaining the corrected Class III malocclusion during the transition to the permanent dentition.

Shailesh Deshmukh: Do you as a rule use the maxillary expansion appliance with a facial mask, irrespective of the transverse width of the maxilla? In the RME/FM appliance, where do you place the hooks for elastic attachment? Is it at the deciduous canines or deciduous first molars? Does it in any way depend on the vertical dimension? What are the force levels you prefer?

James McNamara: We use the bonded expander regardless of whether expansion is required or not. If the patient needs expansion, we have them expand the appropriate number of times. If there is no need to expand, we still have the patient expand 8-10 times to loosen the circummaxillary sutural system. We and others have found that by mobilizing the sutures of the midface, we presumably mobilize the circummaxillary sutural system in facilitating the forward movement of the maxilla.

We typically use hooks that extend above the upper first deciduous molars. If we want to have a more horizontally-directed pull, then we extend the hooks at the level of the teeth into the canine area. Almost always, we use a downward and forward pull on the maxilla that counteracts the reverse autorotation of the maxilla that might occur because of the direction of pull on the teeth, resulting in a counterclockwise rotation of maxillary structures.

We use three different elastics. The first elastic is 3/8" in length and is rated at 8 ounces (e.g., “Tiger” elastics from Ormco Corp.). These elastics generate about 200 grams of force against the maxillary RME appliance. After a week or two, we switch to heavier elastics (1/2", 14 oz; “Whale”) that generate about 350 gm of force. The final elastic is 5/16" and is rated at 14 oz (“Walrus”). These final elastics generate about 600 gm of force, so that by the time we use the third type of elastics, there is a considerable amount of force being generated against the maxillary and mandibular structures.

Shailesh Deshmukh: Is there any particular method you recommend to remove the bonded RME?

James McNamara: The debonding procedure is relatively straightforward. First, one of my chairside assistants applies a topical anesthetic gel above the appliance in the region of the first and second deciduous molars bilaterally. We let the gel activate for a few minutes, and then I will use a pair of ETM 349 pliers to remove the bonded expander. The ETM 349 actually is an anterior bond remover that has a sharp edge on one side and a Teflon cap on the other. The Teflon cap is placed on the occlusal surface of the appliance, and the sharp edge is inserted under the gingival margin of the appliance between the first and second deciduous molars. Then I use a single strong pulling motion that takes about half a second, debonding the left and then the right side of the appliance in one continuous motion.

Obviously the ease of removal of the appliance is dependent on a number of technical factors. One of these factors is making sure that the proper material is used for the acrylic. I do not recommend the “salt and pepper” type of cold cure acrylic application for expander construction because the resulting type of acrylic is too rigid; rather, I strongly recommend the
use of 3 mm thick splint Biocryl applied over the wire framework in a thermal pressure machine such as a Biostar. By using the latter material, the expander is somewhat flexible; it then becomes very easy to break the seal of the adhesive to the teeth.

I also recommend that the chemical cure adhesive Excel™ (www.relianceorthodontics.com) is used for the bonding procedure. This adhesive is made specifically for the bonding of large acrylic appliances. In addition, a sealer should be placed on the teeth, and “plastic bracket primer” should be painted inside the expander prior to the bonding procedure. This primer simply is methyl methacrylate liquid; it softens the inside of the expander so that it can accept the bonding agent. So when we remove the appliance, all the bonding agent comes out in the appliance and none remains on the teeth, making clean-up easy.

Shailesh Deshmukh: The use of chin cups remains a matter of debate, but there are surely those who benefit. Where would you indicate usage, if you do use it?

James McNamara: I have not had extensive first-hand experience with the chin cup (Fig. 7) clinically, although at any given time we usually have one or two chin cup patients in our practice or in the university clinic. The chin cup is indicated in patients who have mandibular prognathism and in whom an increase in lower anterior facial height is not desirable. A chin cup is not indicated in a patient who has maxillary retrusion. There have been many studies, especially in Asian populations such as the Chinese, Koreans and Japanese, that have shown over the short-term that there can be a restriction in mandibular projection in comparison to untreated Class III individuals. As of now, however, there is little evidence to support the premise that the growth of the mandible can be restricted over the long term (unless the patient wears the chin cup continuously from age 6 to age 18, a level of compliance that is difficult to attain).

As I mentioned earlier, we recently have conducted a study of the vertical-pull chin cup (Fig. 4) used primarily in patients with open bite. The most effective use of chin cup was in the early to middle mixed dentition where we observed less increase in face height by about 4 mm, in comparison to a group of individuals who had a steep mandibular plane angle but only were treated with a bonded expander. So there is no question that in the short term, the vertical-pull chin cup can have an effect, presumably in helping to close an anterior open bite. Over the long term, especially in the permanent dentition, however, the effect of the chin cup appears to be negligible if studied in comparison to a group of patients undergoing Phase II fixed appliance treatment but without chin cup wear.

Shailesh Deshmukh: Do you favor the use of slow expansion or rapid expansion?

James McNamara: I have not had much experience in dealing with protocols that deliver so-called “slow expansion.” By that, I mean having the expander turned every other day or every third day. In our practice, we use a one turn-per-day protocol, which is not as rapid as the original protocol of two turns-per-day advocated by Andrew Haas.

Shailesh Deshmukh: You have advocated the use of transverse expansion of the maxilla using RME to alleviate moderate crowding.

James McNamara: This topic has been of great interest to me for over 30 years. I was educated during a time that the extraction of permanent teeth was a common occurrence in orthodontics, with a national extraction rate of 40% or greater observed during the 1960s and 1970s. Since then, the rate of extraction gradually has decreased in the United States today to about 25% nationally. In our practice we extract about 12-15% of the time in Caucasian patients; however, the extraction rate is substantially higher in patients of Asian ethnic background.

Figure 7 - The orthopedic chin cup.
In 2003, our research group published a paper in the *Angle Orthodontist* that dealt with an analysis of 112 individuals treated with a combination of Haas expander combined with fixed appliance therapy in permanent dentition. We found that by using this treatment protocol, in comparison to a control sample from the University of Michigan Growth Study and University of Groningen Growth Study, a residual increase of about 6 mm in maxillary arch perimeter and about 4.5 mm in mandibular arch perimeter was observed at age 21 years. Subsequently, we have conducted two studies that deal with the use of bonded expander used alone in the early mixed dentition or following a mandibular Schwarz expansion appliance that is use to decompensate the lower arch and gain a modest amount of arch perimeter anteriorly. In general, the difference in arch perimeter in these two studies was slightly less than 4 mm in the maxilla and 2.5-3.7 mm in mandible in comparison to a matched untreated control group. Our investigations have shown that in a borderline case of crowding (i.e., 3-5 mm mandibular tooth-size/arch-size discrepancy) these early expansion protocols are reasonable approaches to treatment. On the other hand if a patient has 7-10 mm or more of crowding in the mandible, a serial extraction approach may be in order.

**Shailesh Deshmukh**: Is there any place for serial extractions in your practice? Do you advocate any particular sequence?

**James McNamara**: In our private practice we have about 900 active patients, about 10 of whom are going through a protocol involving serial extraction at any one time. I use the size of the teeth as a guide to patient who requires serial extractions as the appropriate treatment. We know that in a serial extraction protocol, extractions are indicated when there is at least 7 mm of arch length deficiency in the mandible and usually this protocol is undertaken in patients who have well balanced faces. If a patient has a severe mandibular skeletal retrusion or severe mandibular prognathism, it is a good idea to use a serial extraction protocol.

Our studies at the University of Michigan have shown that the size of the central incisor in males of European ancestry is about 8.9 mm and in females is about 8.7 mm, with an standard deviation of 0.6 mm for both genders. So as a guideline, if we have a patient whose central incisor is 10 mm or greater in mesiodistal diameter, he or she would be a potential candidate for a serial extraction protocol. Obviously, the clinician has to take into account the size of all the teeth. But generally a serial extraction protocol is performed in patients who have large tooth size.

Typically we order the extraction of all four deciduous canines, followed 6-12 months later by all deciduous first molars. This protocol hopefully encourages the first premolars to erupt before the canines, so that they can be removed easily, later permitting the canines to erupt into the available arch space. In our serial extraction protocol, ultimately four first premolars almost always are removed.

**Shailesh Deshmukh**: Should we think in terms of aggressive sagittal correction of Class II malocclusion only in those patients with psychological or physiological concerns? Can we rely solely on expansion to allow for a sagittal shift of the mandible?

**James McNamara**: I have evaluated many treatments available for Class II malocclusion for over 35 years and have participated in the evolution of many types of functional appliances including the FR-2 of Fränkel, Bionator, Herbst and Twin Block appliances. In addition, my education at the University of California San Francisco was very strong concerning the use of extraoral traction. So I have seen many different ways of correcting the sagittal position of the maxillary and mandibular bony bases.

Today, the evidence seems to indicate that the most effective time in the maturation sequence of the generic Class II patient who does not have a very severe skeletal problem is during the circumpubertal growth period. The maturational stage can be determined by the level of cervical vertebral maturation (Fig. 8) or by dentitional stage, meaning the late mixed or early permanent dentition. So in most Class II individuals, if it is reasonable I will defer any type of Class II correction until the circumpubertal growth period.

If a patient has a “socially debilitating” Class II malocclusion, however, then I would not hesitate to intervene in a 7-9 year old child, either with extraoral traction or with an appliance such as the Twin Block (Fig. 9) or the FR-2 of Fränkel (or perhaps extraoral traction). I would not expect, however, to have an abundant increase in mandibular growth during that developmental stage. Rather, I would be attempting to make the patient socially acceptable from a psychological standpoint, hopefully leading to an improvement in his or her overall self image.
Figure 8 - CVM maturational stages. The six stages in cervical vertebral maturation. Stage 1 (CS 1): The interior borders of the bodies of all cervical vertebrae are flat. The superior borders are tapered from posterior to anterior. Stage 2 (CS 2): A concavity develops in the inferior border of the second vertebra. The anterior vertical height of the bodies increases. Stage 3 (CS 3): A concavity develops in the inferior border of the fourth vertebra. Stage 4 (CS 4): A concavity develops in the inferior border of the fourth vertebra. Concavities in the lower borders of the fifth and sixth vertebrae are beginning to form. The bodies of all cervical vertebrae are rectangular in shape. Stage 5 (CS 5): Concavities are well defined in the lower borders of the bodies of all six cervical vertebrae. The bodies are nearly square and the spaces between the bodies are reduced. Stage 6 (CS 6): All concavities have deepened. The vertebral bodies are now higher than they are wide. The greatest amount of mandibular lengthening normally occurs between CS 3 and CS 4. 

As far as the generic Class II patient is concerned, I still prefer to evaluate the patient in the early mixed dentition. If there appeared to be a transverse discrepancy, I will intervene by initiating a simple rapid maxillary expansion using a bonded expander to widen the maxilla. At the end of the active expansion phase, the maxilla will be wide relative to the mandible, so that when the appliance is removed, the patient will tend to posture his or her jaw slightly forward in order to improve the occlusal relationship. We now have evidence that spontaneous correction of Class II malocclusion in fact may occur fairly routinely. Obviously if a spontaneous correct does not occur in a given patient, definitive Class II correction is initiated at the beginning of Phase II, typically using a stainless steel crown Herbst (Fig. 10) in combination with fixed appliance therapy.
Shailesh Deshmukh: What are your views on the use of functional appliances in patients with vertical problems? Is the use of active vertical correctors still given consideration in your practice?

James McNamara: Functional appliance therapy in a high angle Class II patient is something I consider. My current treatment of choice is the stainless steel crown Herbst appliance, which I have used fairly routinely since the early 1990s. We also have had good success when using the acrylic splint variety of the Herbst appliance (Fig. 11). I see no significant contraindication to using either type of appliance in a high angle patient.

I had some interest in the active vertical corrector (Fig. 12) in the late 1980s and carried out an unpublished clinical study and also a published study in monkeys. I became discouraged with the active vertical corrector because in both patients and rhesus monkeys, the repelling magnets actually often produced a skeletal asymmetry because the patient or the animal, instead of centering the magnets, moved the mandible to one side. So today, the active vertical corrector has no place in my practice. But we came to appreciate the value of posterior bite blocks, and that is one of the reasons I am so keen on the use of the acrylic splint expander. In fact, a recent study published by our research group in the Angle Orthodontist indicated that almost 1 mm of maxillary molar intrusion occurred during bonded expander therapy.

Shailesh Deshmukh: Recent literature indicates no role of mouth-breathing on the way the face grows. What is your opinion regarding this very contentious issue?

James McNamara: I have been involved in studies of neuromusculature function and craniofacial growth since my PhD work in the early 1970s. We also have been dealing with patients who have mouth-breathing problems not only in my private practice, but also in a study conducted at the Children's Hospital of Pittsburgh in the early 1980s. Our group published a paper evaluating over 200 children who were severely affected with nasal obstruction as documented by radiographic and clinical examinations. A relationship between nasal obstruction, 'mouth-breathing' as determined clinically by a physician, and enlarged tonsils with craniofacial form was identified. It is my belief that there is more of a correlation between altered respiratory function and altered craniofacial growth than has been shown in many of the studies that have been published to date. If I judge that a patient has a respiratory problem, I will send the patient for an ear, nose and throat evaluation after expansion if obvious signs of respiratory obstruction still are present. Respiratory problems should not be ignored by the practicing orthodontist. I wrote a review paper on this subject in the Angle Orthodontist in 1981 that may be of interest to your readers.

Shailesh Deshmukh: Where do we stand when we are asked by parents whether this early treatment approach is going to result in better or more stable results? What is a safe answer to this question?

James McNamara: Only now are we beginning to analyze long-term data regarding early intervention. I started using the bonded expander protocol in 1981,
and although we now have nearly 1200 patients in our treatment sample, accumulating long-term data on patients who are 20 years of age or older is challenging, especially when conducting a non-federally-funded project such as ours. The data we have analyzed thus far indicate that the protocols we have been using are reasonably stable in comparison to untreated controls. I would tell patients and parents that existing research seems to indicate that the treatment protocols seem to provide a stable result over the long-term as long as the patient wears the retainers after active treatment. We recommend full-time wear of retainers for one year and then nighttime wear indefinitely, a protocol that is prudent to use in all patients treated orthodontically for any type of malocclusion.

Shailesh Deshmukh: With all the evidence-based research in recent times and you being one of the foremost personalities leading this development, according to you, will functional appliances have any role to play in the coming years? This question is very important since you were the pioneer in propagating the use of these appliances in USA—especially the FR appliance of Fränkel.

James McNamara: I have been using functional appliances for over 35 years, starting with the activator under the direction of Dr. Egil Harvold at the University of California, San Francisco during my orthodontic program and then the FR 2 appliance later in the early 1970s. I was taught the intricacies of appliance FR-2 management directly by Rolf Fränkel of the former German Democratic Republic (East Germany). At the time I began using functional jaw orthopedics, the key question was whether it was possible at all to lengthen the mandible a clinically significant amount. Today, the question of significant short-term changes has been answered in the affirmative.

I was very optimistic about the long-term changes produced by functional appliances in the 1970s and 1980s, but I am much more guarded in my outlook today. We know that in a controlled experimental situation, such as the study by McNamara and Bryan published in the AIO-DO in 1987 that dealt with long-term changes in the mandibular length produced by a functional protrusion type of appliance), the length of the mandible was about 7 mm longer in length than was seen in the controls (for comparison, most surgical mandibular advancement procedures in humans are in the 5-7 mm range).

Today, the best data regarding the long-term effects of functional appliances are those on the Herbst appliance by Pancherz and associates as well as by other clinical investigators. As mentioned above, virtually all investigators who have studied this appliance have documented an increase in mandibular length in comparison to untreated controls during the treatment period. But over the long-term the net gain in mandibular length may only he 1-2 mm over what one would expect to see without any treatment, an amount that is much less that I would have anticipated finding 10-15 years ago.

Then why use the Herbst appliance, or any functional appliance for that matter? I had the opportunity to talk with Hans Pancherz at Ann Arbor during a seminar with our residents in 2001. His answer to this question was simply that “you get the growth when you need it.” In other words, the functional appliance changes the occlusion from Class II to Class I not only by dentoalveolar change but also by a true skeletal change in the mandible. But over time, the increase in mandibular growth tends to become incorporated into the overall length of the mandible so that the final length of the mandible may be only slightly longer that would have occurred without treatment.

From my perspective, functional appliance therapy will always have a place in the orthodontic armamentarium as long we recognize that functional jaw orthopedics is not the panacea for every short mandible. Today, if I were to conduct an initial examination on a 12 year old female patient in our practice, and their chief complaint was not only a Class II malocclusion but also a retruded chin, I would not hesitate to treat that patient with a Herbst appliance. But I also would suggest the possibility of an advancement genioplasty if mandibular skeletal retraction continued to be a significant problem after treatment. If the patient had true mandibular skeletal retraction, however, orthognathic surgery might be the first treatment option.

With regard to the long-term effects other FIO appliances such as the FR-2 appliance of Fränkel or the Twin Block, we only now are accumulating long-term data; so the jury is still out on that question. It may be that using an appliance that produces more skeletal and less dentoalveolar changes might lead to an improved long-term treatment effect on the length of the mandible.
Shailesh Deshmukh: Would you mind giving us an insight into what type of research are you into at the present time at the University of Michigan? Any new long term studies in the offing?

James McNamara: We are working with a number of individuals around the globe with regard to assembling data bases on various Class II and Class III treatments, with the emphasis on long-term treatment outcomes. We also are continuing our studies of Cervical Vertebra Maturation, applying this method to new and previously evaluated treatment samples, in collaboration with my colleagues Tiziano Baccetti and Lorenzo Franchi from the University of Florence.

In addition, we are beginning studies on microimplants with a number of clinicians throughout the world, particularly with Drs. Kyung, Sung and Park at Kyungpook National University in Daegu, Korea. Microimplants appear to have very promising future in orthodontics, opening new treatment possibilities for our patients.13

Shailesh Deshmukh: Professor McNamara, it has indeed been an immense pleasure and honor talking to you and listening to your views regarding early treatment and other issues. Many thanks to you for sharing your valuable experience with readers in the Indian subcontinent. We hope that you can make a trip to India in the near future.

References


