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CHAPTER

The Spider Screw

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Anchorage control and patient compliance are two of the most critical factors affecting the final outcome of orthodontic treatment. Tooth movement—such as en masse anterior retraction, molar protraction, and intrusion of supererupted teeth—is difficult to achieve without suitable anchorage.¹⁻³ Molar intrusion is sometimes more difficult to achieve and frequently unpredictable because molars are multirrooted with a large root surface area and are located at the terminal aspect of the arch wire, which is less efficient for tooth movement than the intermediate zone of the premolars.⁴ It follows that a skeletal-based, as opposed to a dental-based, anchorage system that is independent of patient compliance would be of significant benefit to orthodontists. One such temporary anchorage device is the miniscrew implant (MSI), which is small, easy to place and use, and well accepted by patients and can be loaded immediately.⁵⁻⁹

THE SPIDER SCREW SYSTEM

The Spider Screw (HDC Company, Sarcedo, Italy) is a self-tapping, commercially pure titanium MSI that can be loaded immediately with forces in the range of 50 to 250 g.¹⁰⁻¹² Complete osseointegration is neither expected nor desired with this system. The Spider Screw anchorage system can be used to support a variety of orthodontic tooth movements in clinical situations involving mutilated dentitions, poor cooperation, or extraction cases requiring maximum anchorage.

The head of the Spider Screw is designed with internal and external rectangular slots 0.022 × 0.028-inch in size. The Spider Screw also has two round internal vertical slots 0.025-inch in diameter (Fig. 14-1). The extramucosal head of the screw is small enough to avoid soft tissue irritation yet large enough to accommodate orthodontic attachments. The different slots permit a variety of ways in which to connect the MSI to the orthodontic appliances. The internal rectangular slot is used to attach elastic or stainless steel ligatures in a

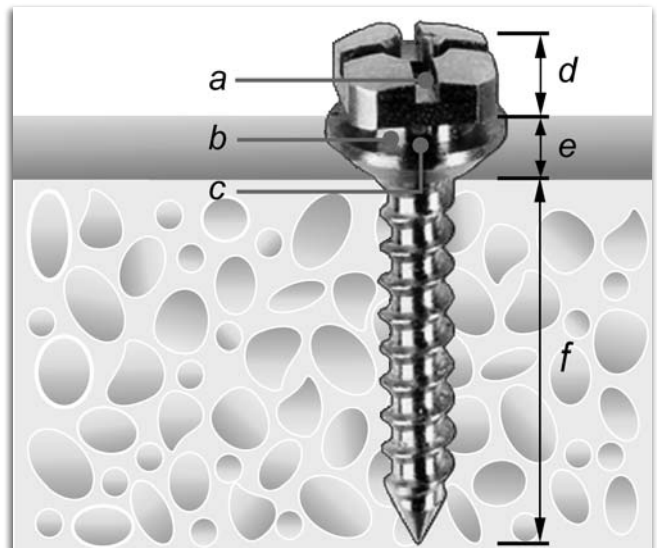


Fig. 14-1

Spider Screw anatomic features. (a) External rectangular slot, (b) internal rectangular slot, (c) internal round slot, (d) abutment head, (e) transmucosal collar, (f) threaded body.

manner that keeps the ties above the soft tissue to prevent soft tissue trauma. The slot size also allows use with the most commonly used orthodontic wires. The external rectangular slot is used mostly for placement of the MSI into bone and for attachment of rectangular arch wires. The vertical slot is used to ligate closed coil springs to the head of the MSI.

This system is available in either 1.5- or 2.0-mm diameters. The 1.5-mm diameter MSI comes in 6-, 8-, or 10-mm lengths, whereas the 2.0-mm diameter MSI comes in 7-, 9-, or 11-mm lengths. Spider Screws are dispensed in prepackaged, sterile, single-use blister packs.

The 1.5-mm diameter Spider Screw is available with either a short or long transmucosal collar (Fig. 14-2). The transmucosal collar length is determined by the depth of the soft tissue, whereas the MSI length is determined by the depth of the hard tissue. The 1.5-mm diameter MSI is indicated for placement in areas with limited space, such as in interradicular bone. The various Spider Screw lengths are placed in the following locations: 6 mm is placed in the anterior region from canine to canine, 8 mm is more adaptable and can be used most anywhere, and 10 mm is placed in the posterolateral region.

The 2.0-mm diameter Spider Screw is available in three different transmucosal collar and abutment head designs to accommodate the soft tissues: *low profile flat*, *low profile*, and *regular* (Fig. 14-3). These variations provide multiple options to ensure proper adaptation of the soft tissues, thereby minimizing the possibility of inflammation. The low-profile flat screw has a short transmucosal collar and a flat head profile for use in the thin soft tissues in the anterior part of the mouth. The low-profile screw has a longer transmucosal collar and a flat head for use in the thick soft tissues of posterior segments. The regular design has an intermediate length transmucosal collar and a higher profile head and when combined with a resin core can be used as a temporary prosthetic abutment.

TREATMENT PLANNING

Every treatment plan requires careful evaluation of the forces necessary to elicit the desired movements and of the anchorage necessary to support these forces. The most frequently used anchorage systems involving extraoral traction or intraoral elastics are associated with several problems. For example, intraoral elastics cause undesirable effects³ and necessitate appliance placement in the lower arch even when not required by the treatment objectives. In addition, extraoral traction

or intraoral elastics depend on patient cooperation. Moreover, many adults avoid orthodontic treatment because of esthetic limitations of conventional anchorage. Skeletal anchorage provides a solution to achieve sagittal and vertical movement without cooperation and without compromising the final orthodontic result. Skeletal anchorage also allows appliance placement in one arch or one segment only.

Treatment planning must include a careful choice of Spider Screw size and location, as well as the manner in which the Spider Screw will be used: indirect anchorage, direct anchorage, or prosthetic anchorage. For indirect anchorage, the reactive segment is attached to and stabilized by the MSI, and the reactive segment is used

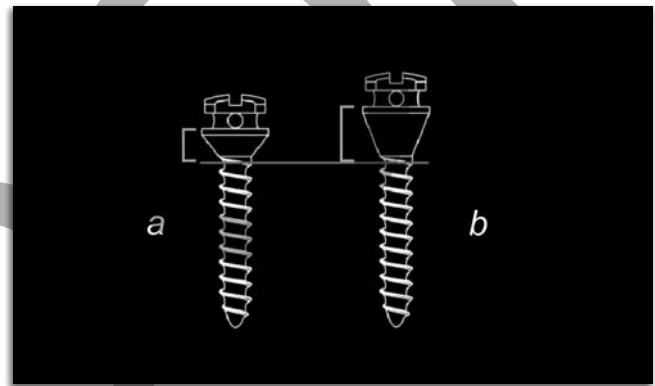


Fig. 14-2

Design characteristics of 1.5-mm diameter Spider Screw. (a) Short transmucosal collar, (b) long transmucosal collar. Note that gold bracket indicates transmucosal collar.

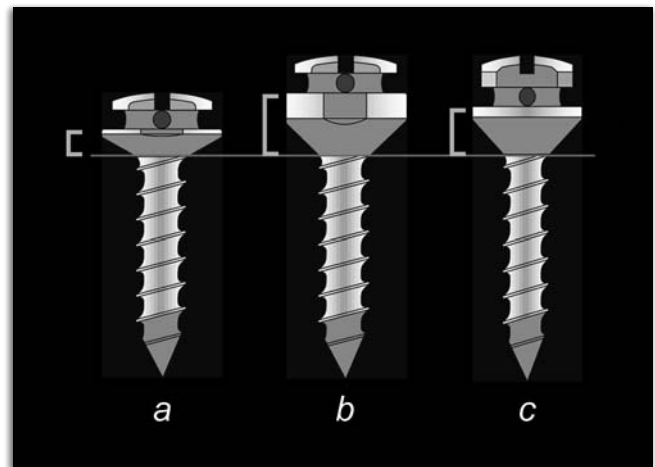


Fig. 14-3

Design characteristics of 2.0-mm diameter Spider Screw. (a) *Low profile flat* with short transmucosal collar and a flat head profile, (b) *low profile* with longer transmucosal collar and a flat head, (c) *regular* with intermediate-length transmucosal collar and a higher profile head. Note that gold bracket indicates transmucosal collar.

to move the active segment. For direct anchorage, the active segment is attached directly to the MSI for tooth movement (see Chapter 1). For prosthetic anchorage, the MSI is placed in the edentulous alveolar ridge and temporarily is restored. The restoration is then used for orthodontic anchorage and is removed afterward. The placement location dictates the ability to control retraction, protraction, extrusion, or intrusion of teeth. The placement of the Spider Screw requires a location that has sufficient bone depth to accommodate the MSI length and at least 2.5 mm of bone width to

protect the local anatomic structures.^{6,10-12} Typical insertion sites include the maxillary tuberosity, the mandibular retromolar area, edentulous ridges, interradicular sites, the palatal vault, and the alveolar processes above the root apices in the anterior region.

For example, a patient presented with an upper dental midline discrepancy to the right side and an interincisal diastema (Fig. 14-4, *A* to *D*). The treatment plan was designed to close the diastema while reopening space for the missing maxillary left first molar to achieve a bilateral Class I canine relationship. Skeletal

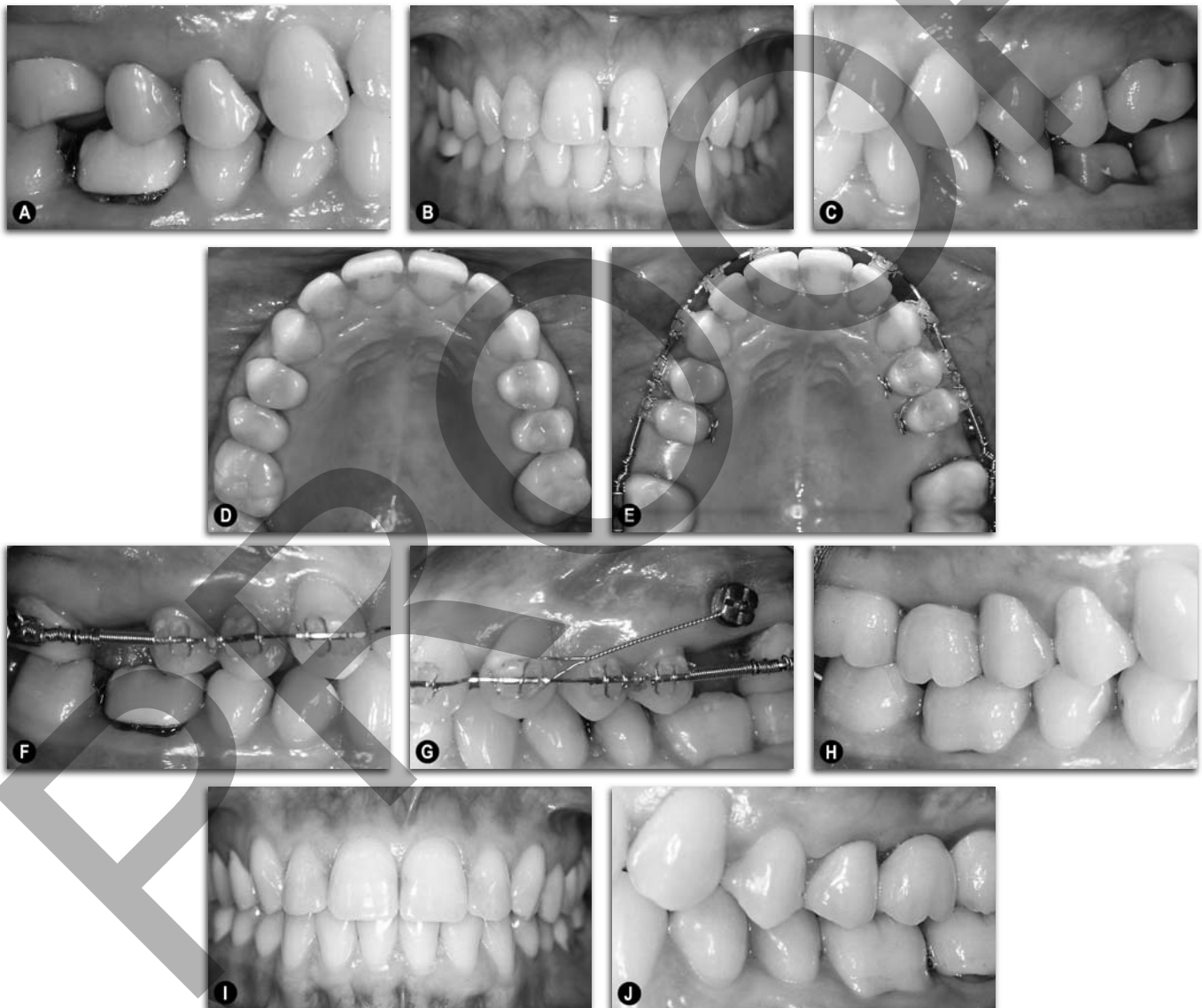


Fig. 14-4

Spider Screw indirect anchorage to distalize maxillary left second molar for replacement of missing first molar. **A**, Pretreatment right buccal photograph. Note Class III canine relationship. **B**, Pretreatment anterior photograph. **C**, Pretreatment left buccal photograph. Note Class I canine relationship. **D**, Pretreatment maxillary occlusal photograph. **E**, Progress maxillary occlusal photograph after molar distalization. **F**, Progress right buccal photograph. Note that reciprocal space opening was used. **G**, Progress left buccal photograph. Note that the Spider Screw was ligated to the canine, which provided indirect anchorage to distalize the second molar. **H**, Posttreatment right buccal photograph. **I**, Posttreatment anterior photograph. **J**, Posttreatment left buccal photograph.

anchorage became the option of choice because the patient rejected extraoral traction and mandibular appliances. Treatment proceeded as follows (Fig. 14-4, *E* to *G*). The maxillary right third molar was extracted, and anchorage was provided by placement of a Spider Screw (2.0-mm diameter, 9 mm long) in the residual space between the maxillary left second premolar and left second molar. The Spider Screw was used as indirect anchorage in this case. A 0.012-inch metal ligature extending from the Spider Screw to the maxillary left canine resisted the forward movement of the canine from the compressed open coil spring. On the patient's right side, a compressed open coil spring was used to distalize the first molar while the reactive force corrected the Class III premolar and canine relationship and shifted the maxillary midline as the diastema closed (Fig. 14-4, *H* to *J*).

Miniscrews can be incorporated into treatment planning when it is difficult to achieve the desired results with traditional anchorage. Miniscrews are particularly useful in adult cases when there are compromised periodontal conditions or partially edentulous arches. Miniscrews are also useful for molar intrusion because intrusion of supererupted molars can create undesirable effects in open bite cases.⁴ Another patient presented with a malocclusion characterized by supereruption of the maxillary left second premolar, first molar, and second molar toward the edentulous ridge in the mandibular left quadrant (Fig. 14-5, *A*). The supereruption created an esthetic problem and precluded the possibility of prosthetic treatment in the mandibular left quadrant. Anchorage for intrusion in the maxillary left quadrant was provided by two Spider Screws. One (1.5-mm diameter, 10 mm long) was placed in the interradiolar bone between the maxillary left first and second premolars, and a second (2.0-mm diameter, 11 mm long) was inserted distal to the maxillary left second molar. The segmental orthodontic appliance

consisted of brackets with a sectional 0.016 × 0.022-inch arch wire. Two 150-g closed coil springs were attached directly from the Spider Screws to the appliance to initiate intrusion (Fig. 14-5, *B*). In the final 2 months of treatment, a bracket was placed on the maxillary left second premolar for intrusion using an elastic from the mesial Spider Screw. Appliance placement was limited to three teeth in the maxillary left quadrant to achieve the desired results (Fig. 14-5, *C*). Routine home care and periodic professional hygiene with scaling and root planing were performed during orthodontic treatment.¹³⁻¹⁵

Another use of MSIs is in patients with multiple missing teeth in whom adequate anchorage is not available. In these cases, Spider Screws can be used to create temporary prosthetic anchorage. For example, a patient presented with a missing maxillary central incisors and a semiankyrotic maxillary right lateral incisor resulting from facial trauma (Fig. 14-6, *A*). Traditional orthodontic treatment was initiated; however, the maxillary right canine and lateral incisor further intruded (Fig. 14-6, *B*). The decision was then made to use skeletal anchorage. Two Spider Screws (2.0-mm diameter, 11 mm long, regular head) were placed in the central incisor positions (Fig. 14-6, *C* and *D*) and were built up with a resin core to create a temporary prosthetic abutment usable for orthodontic treatment. The MSIs were used to extrude the right lateral incisor, avoid intrusion of the adjacent teeth, and temporarily replace the central incisors for esthetics (Fig. 14-6, *E*). After luxation of the right lateral incisor, the Spider Screws were used to facilitate the completion of orthodontic treatment without side effects (Fig. 14-6, *F*). Upon completion of orthodontic treatment, the temporary crowns attached to the Spider Screws were left in place until definitive dental implants and final restorations were placed.



Fig. 14-5

Spider Screw direct anchorage to intrude supererupted maxillary posterior teeth. **A**, Pretreatment left buccal photograph. **B**, Progress left buccal photograph. Note Spider Screws were used directly to intrude molars using closed coil springs. **C**, Posttreatment left buccal photograph.

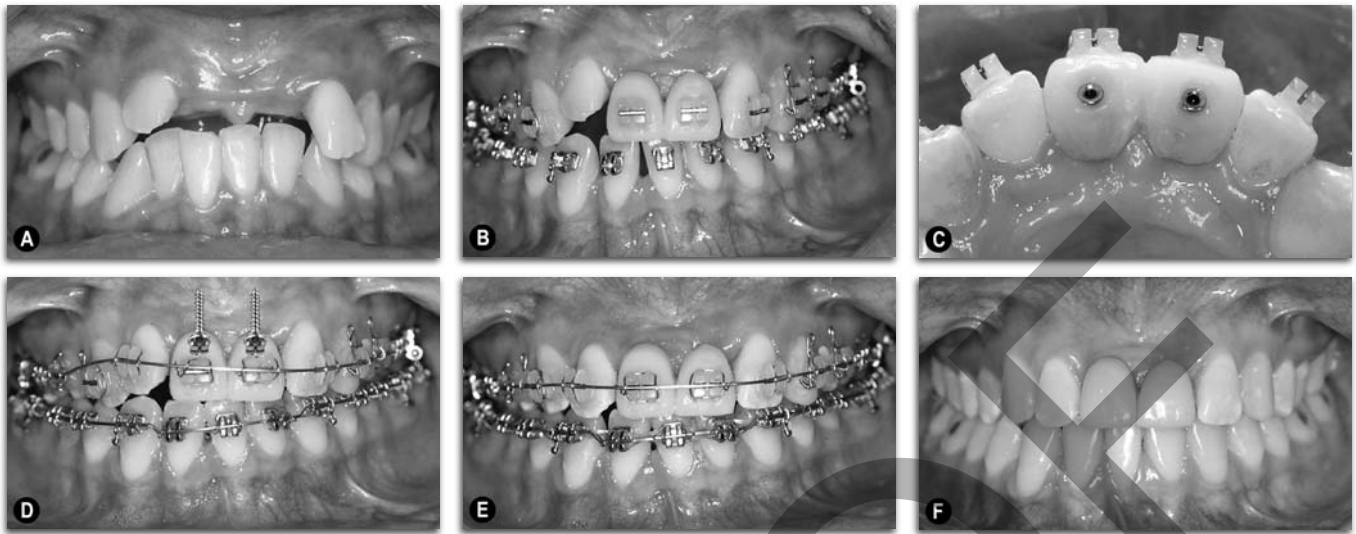


Fig. 14-6

Spider Screw prosthetic anchorage to replace missing central incisors and extrude semiankyrotic lateral incisor. **A**, Pretreatment anterior photograph. **B**, Progress anterior photograph after side effects occurred. Spider Screws were then placed in the missing incisor positions. **C**, Progress anterior occlusal photograph with Spider Screws in place. **D**, Progress anterior photograph during initial leveling. **E**, Progress anterior photograph during detailing phase. **F**, Posttreatment anterior photograph.

PRESURGICAL ORTHODONTICS

Although TAD placement usually does not require presurgical orthodontics, it may be necessary to diverge roots orthodontically in order to create adequate space for interradiolar placement in some cases. For example, in select cases with Class II malocclusions, the maxillary first molars are distalized into super Class I positions before miniscrews are placed mesial to the first molars. The MSIs are then used as anchorage for retraction of the remaining teeth.

SURGICAL PROCEDURE

The surgical armamentarium for Spider Screw insertion includes a slow-speed contraangle handpiece, a pilot drill (1.2 mm for 1.5-mm diameter screw, 1.5 mm for 2.0-mm diameter screw) with depth stops according to screw length, a contraangle adapter, and a hand screwdriver. Every effort must be made to avoid contact with local anatomic structures. When it is necessary to insert the MSIs close to anatomic structures, such as the tooth roots, the maxillary sinus, or neurovascular structures, a surgical template fabricated from orthodontic wire and acrylic resin should be used to precisely locate the insertion point in the bone to avoid adjacent structures.¹⁰⁻¹² The acrylic fits over the occlusal surfaces of the teeth near the surgical site. The wire is embedded in the acrylic and is bent so that it corresponds to the point of screw placement (Fig. 14-7, *A*). Long cone radiographs are taken to visualize the surgical template relative to the

adjacent anatomic structures (Fig. 14-7, *B*). To obtain additional information in the vertical plane, notches are cut into the wire at selected heights. These notches are then visible on the radiographs and can be used to determine the insertion site. Once the insertion site has been determined, the surgical site is prepared while keeping the surgical template in place during the entire procedure.

First, the intraoral tissues are cleaned with 0.2% chlorhexidine, and then the region is anesthetized with local anesthetic. For the 2-mm screw the contraangle handpiece is used to create a 1.5-mm diameter pilot hole (Fig. 14-8, *A*). A slow-speed of 60 to 100 rpm is maintained to *feel* the transition from cortical to medullary bone and to minimize bone overheating. Sterile saline solution is used to cool the site. No incision is required in keratinized gingiva. However, a small 5-mm incision can be made, if necessary, in mobile mucosa before placing the pilot hole. Once the pilot hole has been prepared, the selected screw is removed from its sterilized package with the contraangle adapter and is inserted into the pilot hole at approximately 20 to 30 rpm (Fig. 14-8, *B*).

When the MSI is placed adjacent to tooth roots, we suggest using a small quantity of local anesthetic to anesthetize the soft tissue and bone only. This leaves the periodontal ligament and tooth root sensitive and minimizes the possibility of contacting the tooth root with the pilot hole or screw. Because the screw is

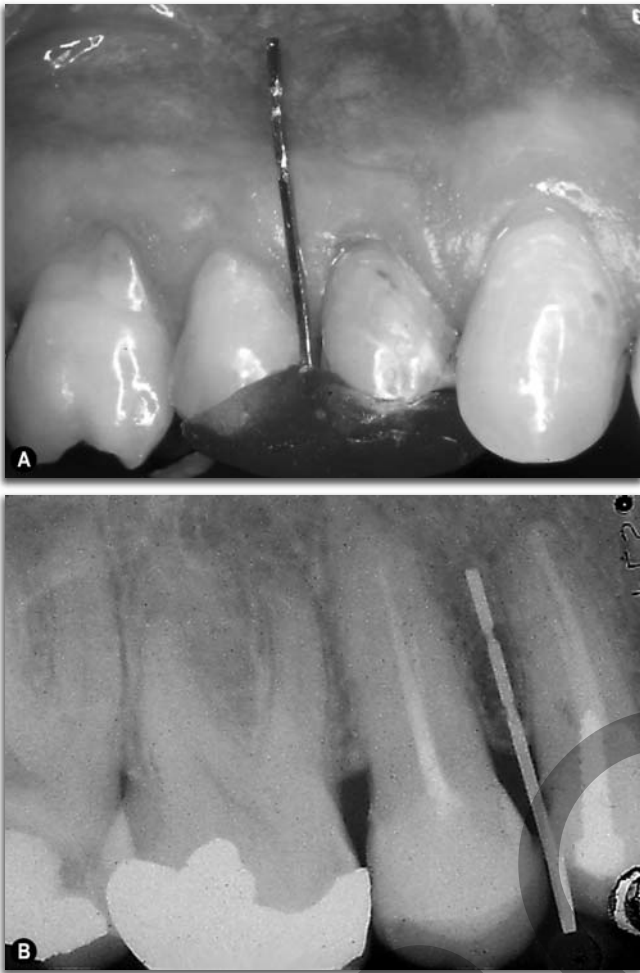


Fig. 14-7

Surgical template. **A**, Acrylic adapted over teeth with wire bent to anticipated MSI site. **B**, Periapical radiograph confirming MSI position.

maintained only by mechanical retention, it should be placed perpendicular to the direction of the applied forces. If it appears that the bone support is inadequate, it is advisable to use a longer screw to reach the opposite cortical plate, thereby providing bicortical stabilization. If a screw is inserted in bone of poor quality, it should be loaded immediately to promote mechanical stability. If the screw has minor mobility, light forces applied immediately⁷ often cause a slight inclination of the MSI in bone and favor better stabilization. The final placement is achieved with a hand screwdriver until the collar of the screw reaches its ideal position in the surrounding tissue.

Immediately after MSI placement, an antiinflammatory is prescribed and a 0.2% chlorhexidine rinse is advised for the next 7 days. Subsequently, the patient is instructed to follow routine hygiene procedures; the same around the MSI as around the teeth. It should be

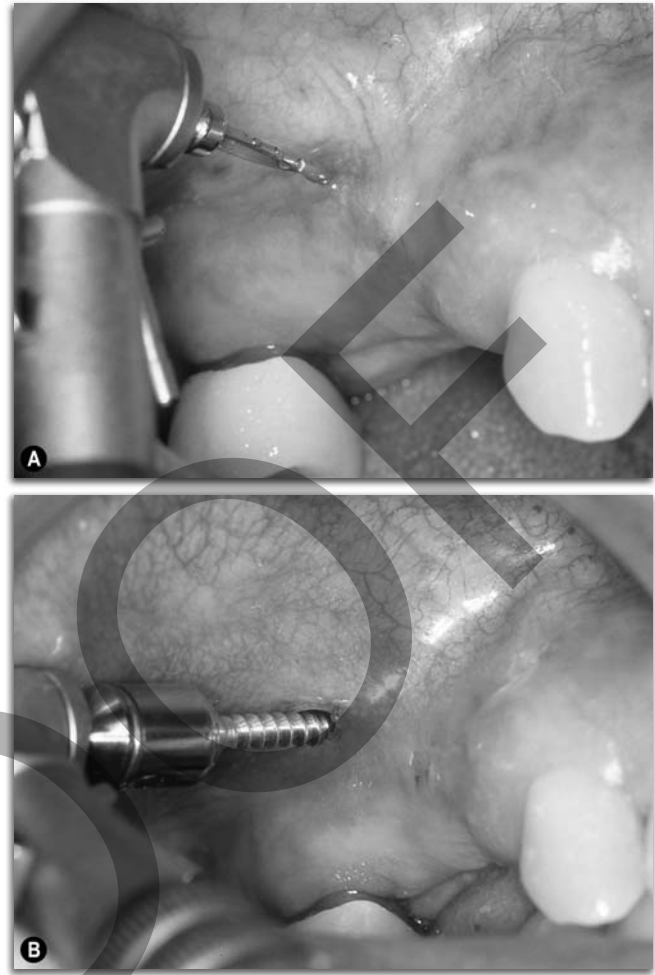


Fig. 14-8

Spider Screw placement protocol. **A**, Pilot hole preparation with 1.5-mm drill. **B**, Spider Screw (2.0-mm diameter) insertion with slow-speed contraangle handpiece.

recalled that osseointegration is neither expected nor desired for this anchorage system. Although some studies have reported a certain degree of osseointegration with immediately loaded MSIs, we have found no difficulty in removing the Spider Screws to date.^{16,17}

ORTHODONTIC MECHANICS

The Spider Screw is connected to the teeth by force modules or ligatures attached to the orthodontic screw head. When spring forces are placed on the Spider Screw, it is best to secure them with a metal ligature attached to the vertical slot in order to avoid accidental detachment. The internal rectangular slot also helps to maintain elastic and ligature ties away from the soft tissues and avoids trauma to them. Forces applied to the miniscrew can vary from 50 g up to 200 g and occasionally 300 g, depending on the quantity of bone and the desired orthodontic movements.^{4,10-12} In sites of less

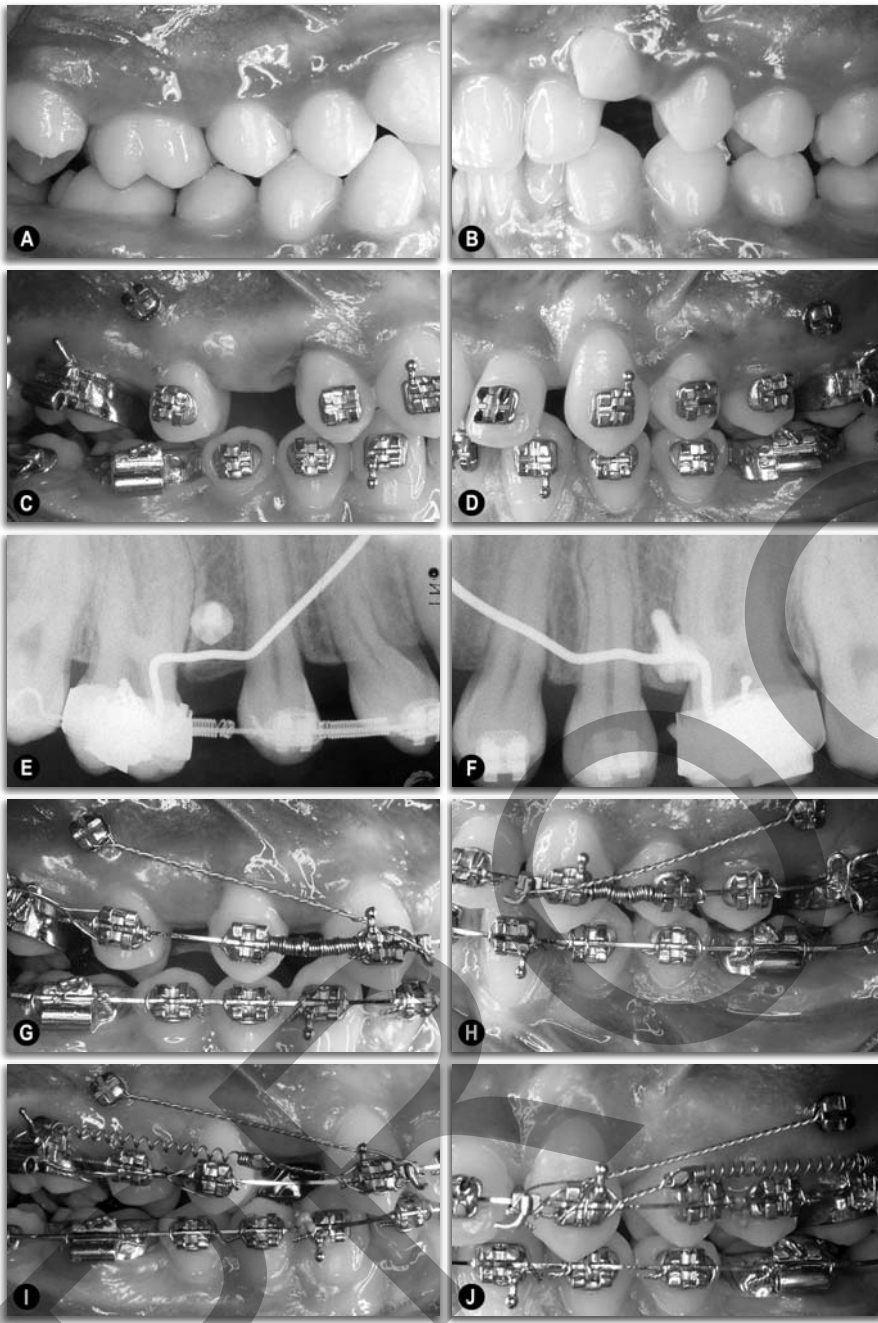


Fig. 14-9

Indirect anchorage to distalize the buccal segments in a Class II malocclusion. **A**, Pretreatment right buccal photograph. **B**, Pretreatment left buccal photograph. **C**, Progress right buccal photograph after maxillary first molar distalization. **D**, Progress left buccal photograph after maxillary first molar distalization. **E**, Right bitewing radiograph after maxillary first molar distalization. **F**, Left bitewing radiograph after maxillary first molar distalization. **G**, Progress right buccal photograph. Note right canine was ligated to Spider Screw to distalize first premolar. **H**, Progress left buccal photograph. Note left canine was ligated to Spider Screw to distalize first and second premolars. **I**, Progress right buccal photograph. Note right canine was directly retracted with Spider Screw via closed coil spring. **J**, Progress left buccal photograph. Note left canine was directly retracted with Spider Screw via closed coil spring.

bone quality, the force applied should be decreased as necessary.

Miniscrew implant anchorage can be indirect, direct, or via prosthetics. In Class II noncooperative patients, indirect anchorage is generally used. For example, in a Class II patient (Fig. 14-9), two Spider Screws (1.5-mm diameter, 9 mm long) can be inserted mesial to the maxillary first molars after distalization of the molars to a Class I relationship (Fig. 14-9, *C* to *F*). In this case the Spider Screws are used to retract the teeth anteriorly into the created space. An 0.016 × 0.022-inch rectangular wire with stops mesial to the first molars and hooks mesial to the canines was inserted. Indirect anchorage mechanics were used to retract the premolars and canines. On the right side, a metal ligature was placed from the MSI to the canine, and a 150-g open coil spring was placed between the first and second premolars in order to distalize the second premolar (Fig. 14-9, *G* and *J*). On the left side a metal ligature was placed to the hook, and a 150-g open coil spring was extended from the molar to the canine (Fig. 14-9, *H* and *I*).

Spider Screws also offer reliable direct anchorage for retraction of groups of teeth or individual teeth (Fig. 14-10). To retract and simultaneously intrude teeth, MSIs should be located above the occlusal plane. In that position, power arms are inserted into the vertical slots of the brackets. This moves the point of force application closer to the center of resistance and makes possible pure translation or bodily movement of the teeth and minimizes the intrusive component of the orthodontic force.

Biomechanically, the vertical MSI position should be determined relative to the occlusal plane and depends on the type of tooth movement desired. For



Fig. 14-10

Direct anchorage to retract anterior teeth en masse. **A**, Progress right buccal photograph. **B**, Progress anterior photograph. **C**, Progress left buccal photograph. Note closed coil springs are attached directly from Spider Screw to power arm through canine bracket.

intrusion and retraction, the MSIs should be placed as high in the vestibule as possible (Figs. 14-11 and 14-12). When only retraction is the main objective, the MSIs should be placed closer to the occlusal surface of the teeth. When intrusion cannot be tolerated, the MSIs should be used indirectly. In this type of case, the canine is ligated directly to the MSI, and then the first molar is used to attach a horizontal force to retract the incisors directly (Fig. 14-13).

Facial inclination of the clinical crowns tends to occur with intrusion. Control can be achieved by torquing arch wires or with transpalatal bars. Alternatively, crown control can be maintained by the placement of a palatal miniscrew and the application of palatal and facial forces simultaneously (Fig. 14-14). Precise intrusion occurs quickly when using proper forces (Fig. 14-15). It is important, however, to prevent inflammation, eliminate pockets, and establish a sound periodontal environment before intrusion is attempted. Good home care, professional cleaning, and scaling and root planing are necessary during treatment.¹³⁻¹⁵

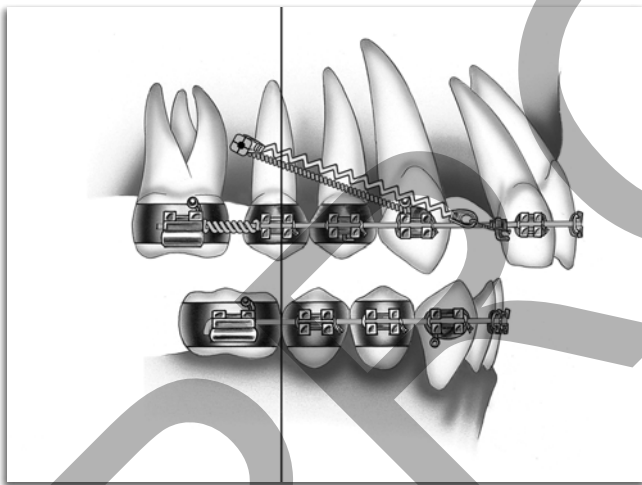


Fig. 14-11

Diagram illustrating direct anchorage mechanics for simultaneous intrusion and retraction of anterior teeth using Spider Screw system.

The regular Spider Screw can be used in edentulous areas both as anchorage and as a provisional prosthesis simultaneously (Fig. 14-16, *A*). To fabricate the temporary abutment, a prefabricated resin core is secured to the head of the regular Spider Screw by a small screw. The resin core is then shaped into a tooth form and is cemented in place (Fig. 14-16, *B*).¹⁰⁻¹² For example, in a Class II malocclusion characterized by a missing upper right second premolar and first molar, a temporary four-unit bridge extended from the maxillary right first premolar to the maxillary right second molar. The maxillary right lateral incisor was rotated, and a carious lesion was present on its distal surface (Fig. 14-17, *A* and *D*). The treatment plan was to create



Fig. 14-12

Direct anchorage for simultaneous intrusion and retraction of anterior teeth using Spider Screw system. **A**, Progress right buccal photograph. **B**, Progress anterior photograph. **C**, Progress left buccal photograph.

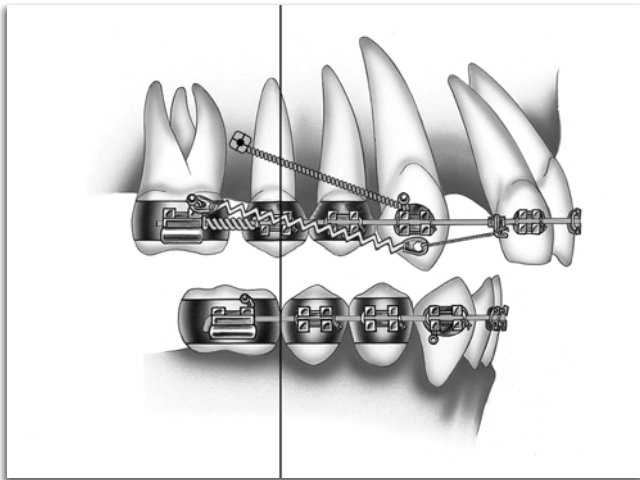


Fig. 14-13

Diagram illustrating indirect anchorage mechanics for retraction without intrusion of anterior teeth using Spider Screw system.

a Class I canine relationship by retracting the upper right canine and then rotating the lateral incisor so that it could be restored properly. The bridge was removed, and a Spider Screw (2.0-mm diameter, 11 mm long) was inserted into the edentulous ridge in the second premolar position where it served as an abutment for a three-unit temporary bridge in the maxillary right quadrant (Fig. 14-17, *G* to *J*). Brackets were placed on the maxillary teeth, and a segmental 0.016 × 0.022-inch stainless steel wire was inserted. The maxillary right first premolar and canine were retracted by 150-g elastic forces applied on the buccal and palatal surfaces (Fig. 14-17, *B* and *E*). The maxillary right lateral incisor was then rotated into proper alignment. At the completion of orthodontic treatment, the Spider Screw was removed and the final prosthetic reconstruction was placed (Fig. 14-17, *C* and *F*).

REMOVAL PROCEDURE

Spider Screw anchorage does not depend on osseointegration. One study has demonstrated that 2-mm diameter implants placed in beagle dogs and used for intrusion had less than 25% osseointegration.⁹ The forces applied were similar to those used in clinical practice, and the screws were easily removed. In clinical practice the screws are also easily removed, indirectly suggesting minimal Spider Screw osseointegration. Other studies also indicate that in spite of the presence of a certain degree of osseointegration, the smooth surface of the screw facilitates easy removal.¹⁷ To remove the miniscrew, simply unscrew it with the appropriate screwdriver. Removal can usually be accomplished without anesthesia, and healing takes place in a few

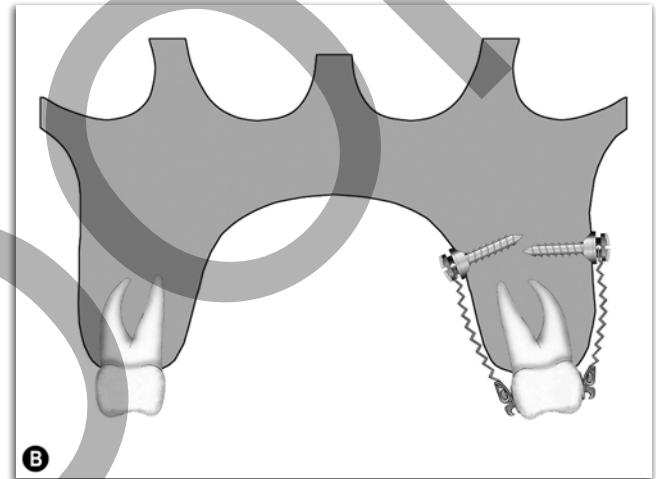
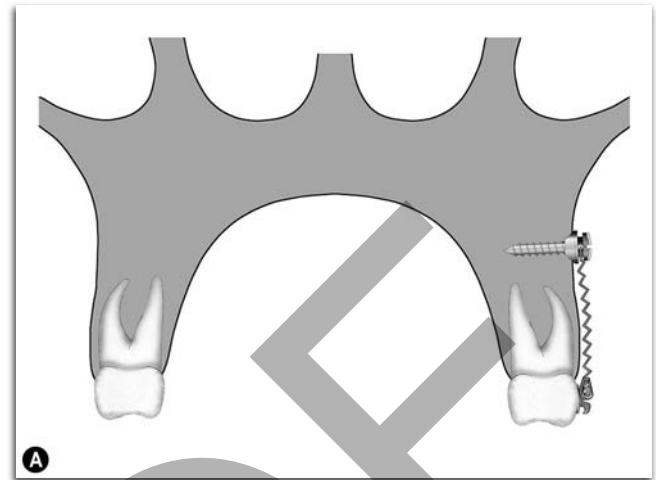


Fig. 14-14

Diagram illustrating torque control with Spider Screws. **A**, Facial tipping would occur during intrusion with a Spider Screw on the facial surface only. **B**, Pure intrusion would occur during intrusion with a Spider Screw on the facial and palatal.

days (Fig. 14-18). A 0.2% chlorhexidine rinse is usually recommended for the first few days after removal.

POTENTIAL COMPLICATIONS

One possible complication is inflammation of the periimplant tissues, especially in areas of frenum tissue or muscle tissue.^{18,19} These problems can be controlled with proper oral hygiene and topical application of a 0.2% chlorhexidine rinse. Sometimes, insertion of the MSI high in the vestibule creates mucosal complications. In these cases, the clinician should attempt to use anchorage mechanics that requires minimal adjustments at the abutment head of the screw. In the event of MSI mobility, it can be replaced with a longer and larger-diameter MSI. If this is not sufficient, another site for placement should be chosen. If, during insertion of the MSI, the periodontal ligament is inadvertently contacted,

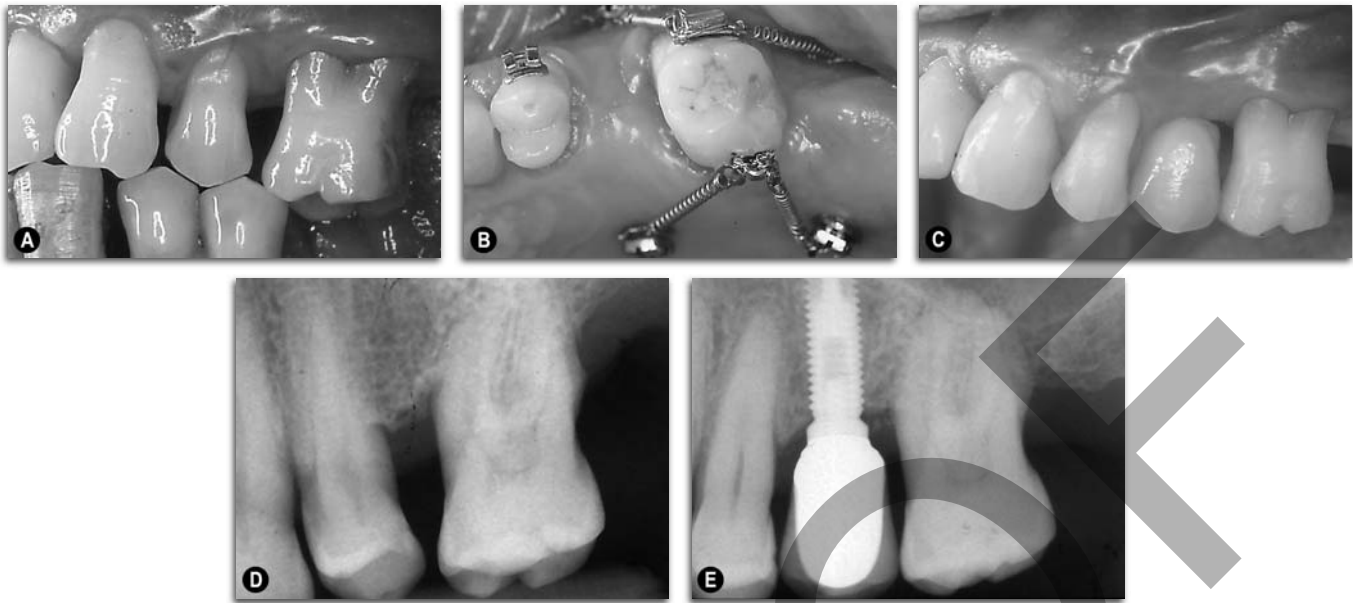


Fig. 14-15

Direct anchorage to intrude and distalize supererupted maxillary second molar into normal position. **A**, Pretreatment left buccal photograph. **B**, Progress left occlusal photograph of Spider Screw mechanics. Note two Spider Screws are used on both the facial and palatal surfaces to control torque and tip. **C**, Posttreatment left buccal photograph. **D**, Pretreatment bitewing radiograph. **E**, Posttreatment bitewing radiograph. Note bone level improvement.

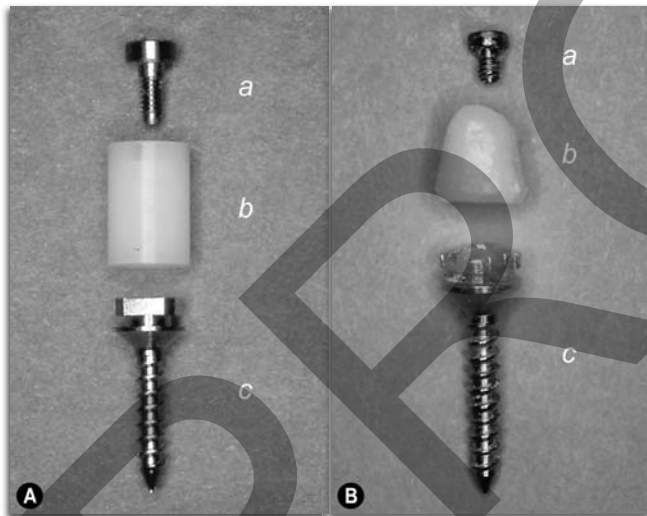


Fig. 14-16

Fabrication of tooth-shaped abutment on Spider Screw. **A**, Original components. (a) Long abutment screw, (b) untrimmed acrylic abutment, (c) Spider Screw *regular*. **B**, Adjusted components. (a) Short abutment screw, (b) trimmed and adjusted acrylic abutment, (c) Spider Screw *regular*.

the patient will show symptoms of pain to percussion or mastication. If a root is contacted during insertion, the patient will develop sensitivity to hot and/or cold. In these cases, the MSI should be removed; antiinflammatory and antibiotic therapy may be initiated.

SUMMARY

The Spider Screw is versatile and can be placed intraorally in any location with sufficient bone and is immediately loadable after placement. The simplicity of surgical insertion makes the Spider Screw a viable anchorage option in the conventional orthodontic practice. Through the use of a surgical guide, it can be placed precisely and dependably in areas of reduced space approximating important anatomic structures. MSIs of 2.0-mm diameter and up to 11 mm long can be used in areas of bone that have reduced quality or quantity. The variety of transmucosal heights and the specifically designed orthodontic head controls tissue trauma and inflammation while simultaneously providing ease of use by the orthodontist.

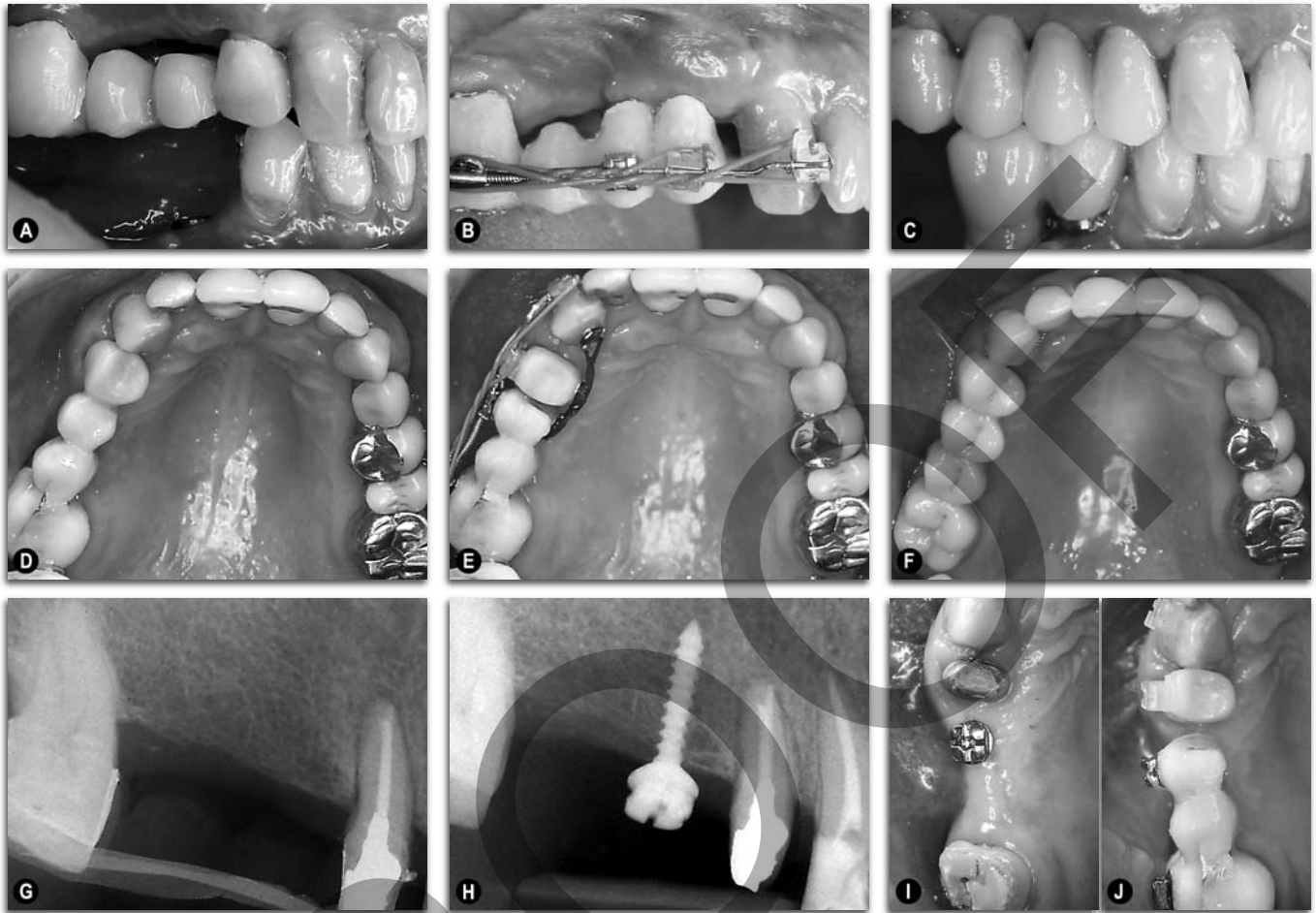


Fig. 14-17

Spider Screw prosthetic anchorage to correct Class II malocclusion with missing maxillary right second premolar and first molar with rotated right lateral incisor. **A**, Pretreatment right buccal photograph. **B**, Progress right buccal photograph. Note that four-unit bridge has been replaced with three-unit bridge attached to Spider Screw mesially. This allows retraction of anterior teeth into the created space. **C**, Posttreatment right buccal photograph. **D**, Pretreatment maxillary occlusal photograph. **E**, Progress maxillary occlusal photograph. Note that canine is being retracted into created space. **F**, Posttreatment maxillary occlusal photograph. **G**, Pretreatment periapical radiograph of four-unit bridge. **H**, Progress periapical radiograph with Spider Screw in place. **I**, Progress maxillary occlusal photograph. Note four-unit bridge has been removed, Spider Screw is placed in the second premolar position. **J**, Progress maxillary occlusal photograph with new three-unit temporary bridge anchored to Spider Screw.



Fig. 14-18

Spider Screw removal procedure. **A**, Spider Screw removal with manual screwdriver. **B**, Left buccal photograph immediately after Spider Screw removal. **C**, Left buccal photograph 7 days after Spider Screw removal. Note healed soft tissue

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