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AUXILIARIES FOR IMPACTED CANINES: A REVIEW

Orthodontics

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ABSTRACT

Managing impacted canines presents a significant challenge for orthodontists, necessitating a multidisciplinary approach that incorporates accurate diagnosis and meticulous biomechanical planning, alongside a comprehensive orthodontic appliance. To ensure that the disimpaction process gives the desired results without compromising periodontal health, an effective mechanical system should encompass: 1) A passive auxiliary attachment unit that offers controlled rigidity for traction while safeguarding both the tooth and surrounding tissues. 2) A passive anchorage unit that ensures stable anchorage, preventing undesired movement of adjacent teeth. 3) An active auxiliary that exerts a gentle and continuous traction force across an extended range. This article provides an overview of auxiliaries for disimpacting canines, simultaneously offering a classification framework that outlines various passive and active auxiliaries. By selecting from the diverse array of disimpaction auxiliaries, orthodontists can tailor their choice to suit the specific requirements of individual case.

KEYWORDS

Impacted canines, Canine Disimpaction, Auxiliaries, Review

INTRODUCTION

The orthodontic management of impacted canines holds significant importance due to their role in establishing functional occlusion, enhancing facial appearance, and improving dental aesthetics.[1] Once a proper diagnosis of an impacted maxillary canine is made and its prognosis assessed, a surgical technique is employed to expose an adequate portion of the tooth. Simultaneously, an attachment is bonded while maintaining a moisture-free environment.

Subsequently, a gentle and continuous traction force, with a magnitude under 60 grams, is applied either immediately or during a subsequent orthodontic appointment. This force guides the canine into its proper position without causing any damage to the periodontal structures.[2]

The availability of advanced materials, digital imaging, and 3D printing has resulted in the creation of numerous effective orthodontic appliances and auxiliaries. These tools are designed for attaching necessary components and applying traction forces to impacted teeth. Given the limited existing literature on auxiliaries for canine disimpaction, this article serves as a comprehensive overview of the various options available. Its primary goal is to bridge the gap in knowledge in this specific area.

Canine Disimpaction Auxiliaries

A conventional bracket system alone might not fully achieve all the desired orthodontic tooth movements. In particular, additional auxiliaries are necessary for effectively repositioning canines. These auxiliaries can be broadly categorized as passive or active (insert Figure 1)

Passive Auxiliaries

Passive disimpaction auxiliaries, which facilitate canine traction without applying direct force, can be primarily classified into two types: 1) Attachment units and 2) Anchorage units (refer to Table 1).

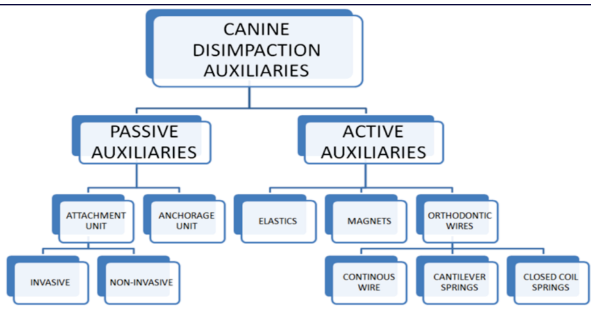

Figure 1: Classification of canine disimpaction auxiliaries

Table 1: Passive disimpaction auxiliaries

ATTACHMENT UNIT	ANCHORAGE UNIT
A) Invasive	Removable appliances
Lasso wire	Transpalatal arch and modification
Threaded pins	Modified Nance palatal arch
Bur hole with wire	Modified mandibular lingual arch
Bur hole with miniscrew	Quad- helix and modification
B) Non- invasive	Temporary anchorage devices (TADs)
Swaged crowns	Single TAD
Eyelets with soldered mesh	Two TADs
Bands	Bracket headed TADs
Bracket	Multi attachment appliance
Lingual button	Miniplates
Monkey Hook	Interarch technique
Multipurpose attachment	Benefit &Beneplate system
Titanium button with chain	3D printed metal device

Attachment unit

Passive auxiliaries that are directly affixed to the tooth to receive traction forces are referred to as attachment units. These can be categorized into two types: a) Invasive attachments and b) Non-invasive attachments.

Invasive attachments are those that cause damage to the crown or root of the impacted tooth. Examples of invasive attachment units include lasso wires (cervical neck wires), threaded pins, bur holes with wires, and bur holes with miniscrews. A method introduced by Hyadar SG et al[3]involves the use of a bur hole with a microscrew, which eliminates the need for attachment bonding. This method entails drilling a hole that is 1.5 mm deep and 0.9 mm wide using a diamond bur on the palatal surface of the impacted tooth. A microscrew (diameter of 1 mm) with a ligature chain is then inserted into the bur hole. This approach effectively eliminates the most common complication associated with invasive methods, i.e., bond failure.

Non-invasive attachments are attachments that are bonded onto the crown of an impacted tooth following surgical exposure. Ensuring proper isolation after surgical exposure when bonding a non-invasive attachment is a pivotal step in achieving a successful disimpaction rate for impacted canines. Among the array of non-invasive attachments for canine disimpaction, commonly utilized options include eyelets with soldered mesh, Begg brackets, and lingual buttons. A study conducted by Becker A et al[4]yielded a conclusion that eyelet attachments soldered onto mesh exhibit a higher success rate in comparison to conventional brackets. However, it's worth noting that when disimpacting highly impacted canines, brackets or buttons bonded onto the exposed crown can potentially induce tissue irritation and ulceration.[5]

The Multi-Purpose Attachment (MPA), introduced by BhumaVashi and Nikhil Vashi[5], presents a notably discreet and non-invasive attachment option. This attachment can be easily fashioned within a clinical setup using band material. The process involves creating a lumen on one side of a small band material strip to accommodate the ligature wire, while a mesh is positioned on the opposite side for bonding purposes. The attachment of an MPA onto an impacted tooth results in minimal tissue irritation and ulceration due to its low-profiledesign.

Another noteworthy attachment is the Multiple Monkey Hook with Button, conceived by S Jay Bowman and Aldo Carano.[6] This auxiliary boasts a straightforward 'S' shape, featuring open loops on each end. These loops enable seamless connection to a bondable lingual button or the secure attachment of elastics and elastomeric chains. Additionally, the Titanium Button with Chain, developed by Dr. NezarWattedet al[7], stands out as a more robust non-invasive attachment. This attachment offers an effective control system, enhancing the precision and efficiency of traction for impacted canines.

Anchorage unit

Passive anchorage units, which prevent or minimize the unintended movement of other teeth when traction force is applied to the impacted tooth, are referred to as anchorage units. An overview of different anchorage units is provided below:

Removable Appliances: Retentive removable appliances with soldered hooks on the clasps' bridge offer an excellent anchorage base for applying gentle elastic traction to disimpact impacted canines, all while avoiding any potential root damage to adjacent incisors. It's worth noting that upper removable appliances tend to provide better resistance against dislodgment during traction force application, although lower removable appliances can facilitate a slightly more vertically directed force vector.[8]However, prior research highlights certain drawbacks associated with these appliances, including their reliance on patient compliance and the restricted ability to control unwanted tooth movement.[9]

Transpalatal Arch and Quad Helix: In the management of highly impacted canines, the integration of a Transpalatal Arch (TPA) alongside a buccal stainless-steel spring proves effective in curbing both molar rotation and palatal displacement of the upper first molar during traction.[10] This mechanism serves to preserve the alignment and positioning of the molars. To amplify these efforts, a modified TPA featuring a soldered cantilever has been implemented, allowing for the application of vertical force to strategically displace the impacted crowns away from the neighboring incisor root.[11]Similarly, modified Quad Helix like the Quad Helix with an additional palatal arch crafted from beta-titanium wires[12] and Quad Helix Canine System with additional buccal and lingual arm with eyelets[13]serves a dual role. Not only does it facilitate the application of vertical traction force for the impacted canines, but it also offers the distinct advantage of augmenting the expansion of the maxillary arch.[12]

Modified Mandibular Lingual Arch: The modified mandibular lingual arch, featuring soldered vertical hooks,[14] emerges as a pivotal player in anchorage provision for traction, thereby facilitating the vertical eruption of palatally impacted canines. This design boasts exceptional versatility, enabling swift and effortless alteration of traction direction. Consequently, this adaptability mitigates the potential deleterious repercussions such as root resorption of neighboring teeth. Moreover, this approach permits traction force application prior to arch alignment and leveling, thereby contributing to a reduction in overall treatment duration. However, it's crucial to acknowledge that traction exerted by elastics from the lingual arch presents certain inefficiencies. This is attributed to the limited distance available for elastic activation and the consequential interference with tongue movements.[15]

The Modified Nance Appliance: Sahee Park et al[16] made modifications to the Nance appliance by adding a bracket to the resin button. This alteration allows for a change in the direction of traction force without requiring the removal of the appliance. Additionally, this modification provides effective anchorage control, promotes periodontal health, and enhances compliance among young patients.

Temporary anchorage devices (TADs): The effectiveness and predictability of orthodontic treatment have significantly improved with the integration of TADs. While using conventional tooth-borne anchorage devices during canine disimpaction, reactionary tooth movement can be observed in the treated arch. These movements encompass the intrusion of the anchorage tooth/teeth and the palatal movement of the anchorage unit. This effect is particularly pronounced when applying buccal traction to palatally impacted canines.[17]Several authors have incorporated TADs into their mechanical disimpaction systems, primarily to provide anchorage for traction before alignment, effectively preventing undesired tooth movement and root damage. Furthermore, TADs facilitate the repositioning of the canine, mitigating root obstacles.[17-22]

Miniscrews, microimplants, bracket-head miniscrews,[19] a double anchorage system with two TADs, a mixed anchorage system (combining TADs with additional support from the molar), anchorage plates, interarch traction technique[21] (which involves interradicular TADs placed on the mandibular arch based on the position of the impacted maxillary tooth), and the Benefit &Beneplate system[22]can all serve as anchorage options for canine disimpaction. Employing a single TAD for canine disimpaction won't suffice to stabilize the cantilever in all three dimensions. Therefore, either two TADs (forming a double anchorage system) or a mixed anchorage system can enhance the stability of the miniscrew during the activation and deactivation of springs.[17]

Palatally impacted canines situated close to incisor roots can be effectively disimpacted using the "Canine First Technique" developed by Bocchinoet al[20]at the University of Naples "Federico II". This approach involves a surgical orthodontic procedure that utilizes a cantilever spring and TADs to move the canine away from neighboring incisor roots. A miniscrew (1.48× 11mm or 1.3/1.2 × 8 mm) placed in the palatal safe zone (5mm away from the embrasure between the premolar and first molar) serves as the anchorage point, while a TMA cantilever spring inserted into the miniscrew applies distalization and extrusion forces to the crown, thereby shifting it away from the incisor roots.

3D-Printed Metal Device: This innovative device is designed based on digital models generated from Cone Beam Computed Tomography (CBCT) and intraoral scanning data. It is fabricated using Selective Laser Melting technology and biocompatible Cobalt-chromium alloys. The device design features a 3D metal framework with a semi-circular structure indicating the location for surgically exposing the crown. Additionally, a metal projection is incorporated for attaching intraoral elastomeric chains for traction purposes. The utilization of 3D design offers multiple benefits, including enhanced accuracy, reduced operating time, and minimized errors during the surgical exposure procedure. However, it's important to note that potential adverse effects such as soft tissue irritation can arise with the use of this device.[23]

Active Auxiliaries:
Active auxiliaries are instrumental in applying the necessary traction force to impacted canines, effectively guiding them into their appropriate positions within the dental arch. These auxiliaries can be broadly categorized into three types, contingent on the material employed: a) Elastics b) Magnets and c) Orthodontic wires. Table 2 outlines the active auxiliaries utilized for canine disimpaction.

Table 2: Active disimpaction auxiliaries

ACTIVE AUXILIARIES	
1) Elastics	
2)Magnets	
3)Orthodontic Wires	
A) Continuous wire	B) Cantilever spring
Active Palatal Arch	Canine extrusion spring
Light Auxiliary Labial Arch	Ballista Spring
Piggy back NiTiArchwires/	TMA Fishing rod
Two Arch Wire Technique	TMA Box Loop
Australian Helical Archwire	K-9 Spring
	Modified K-9 spring
	Kilroy Spring
	Modified Kilroy I Spring
	Canine extrusion auxiliary
	Modified reverse torquing auxiliary
	Extrusion spring by Oppenhuizen
	Easy Cuspid system
	Modified uprighting spring
	Shoulder Spring
C) Closed coil spring	
NiTi Closed coil spring	
Easy Way-Coil (EWC) System	

Elastics: Employing intraoral elastomeric chains in conjunction with fixed appliances, along with a stiffer 0.019×0.025 inch stainless steel archwire, proves effective in applying the necessary traction force.[24]This technique is facilitated by connecting intraoral elastics with a lumen size that delivers a force within the range of 40-60 g. These elastics are attached to soldered hooks on removable appliances,[7] lingual arches,[14] and TADs[18] all of which contribute to aligning the impacted canines into their appropriate occlusal positions. Notwithstanding its benefits, elastic traction does present certain drawbacks. Force degradation, up to 50% within a 24-hour period, is a notable concern, as is the challenge of attaining precise control over the direction of force.[25,26]

Magnets: The application of attractive magnetic forces for canine traction was initially detailed by Sandler PJ et al[27,28] In their approach, a smaller 3×3×1 neodymium-iron-boron bracket was bonded within composite resin to the exposed impacted canine, while a larger magnet (5×5×2)was embedded in the acrylic of an upper removable appliance. Another magnetic system was introduced by Vardimon et al,[29]involving an edgewise magnetic bracket (neodymium-iron-boron prism shape coated with parylene) affixed to the impacted crown. Complementing this, an intraoral magnet (cylindrical neodymium-iron-boron shape coated with parylene) was embedded in the upper removable appliance. This innovative configuration generates an attractive force ranging from about 0.2 to 0.5 N, effectively facilitating the traction of impacted teeth.

Magnetic traction for impacted canines presents operator-friendly advantages, as it eliminates the need for wire manipulation while promoting a more physiologic eruption through the application of low, gradually increasing continuous force.[28]The strength of the attractive magnetic force is inversely proportional to the square of the distance between the magnets. Consequently, as the distance increases, the force magnitude diminishes, potentially resulting in inadequate force for effective disimpaction. Moreover, if not protected by an acrylic coating, magnets might corrode intraorally.[30]

Orthodontic wires: Utilizing orthodontic wires with a low load deflection rate and a substantial range of action is the preferred approach for constructing active auxiliaries that exert extrusive force on impacted teeth. These auxiliaries, fashioned from sturdy orthodontic wires, can take the form of a continuous wire, wire segments such as cantilevers, or closed coil springs.

Continuous Wire: Continuous wire auxiliaries are fashioned from orthodontic wires and are linked to one or more brackets on either side of the impacted tooth. However, it's important to note that many methods employing continuous wire auxiliaries for traction necessitate an additional stiffer base archwire. This addition is aimed at minimizing the undesired movement of adjacent teeth. Consequently, the application of eruptive force can only commence after the bracket system is equipped with a rigid base archwire. Regrettably, this can extend the overall treatment duration.[31,32]

Active Palatal Arch: The active palatal arch is a removable, horse-shoe shaped device crafted from 0.020-inch stainless steel (SS), featuring Omega loops on both sides. To ensure seamless insertion into the lingual sheath without friction, the free ends are doubled. By employing a single activation, this device can exert vertical force on highly positioned bilateral impacted canines, effectively displacing them away from adjacent incisor roots.[33]

Light Auxiliary Labial Arch: The concept of the light auxiliary labial arch was introduced by Korhnhauseret al.[34]This design incorporates a buccal auxiliary spring crafted from 0.014/0.016 stainless steel (SS) wire. It features a vertical loop with a helix at its extremity, positioned opposite to the prepared canine space. This assembly is then attached in a piggyback manner to all brackets using a basal archwire (with a gauge less than 0.020 round or 0.0175 x 0.025 rectangular), mirroring the exact shape of the maxillary base archwire. The auxiliary spans from the distal end of the second premolar on the impacted side to the contralateral canine bracket. Extending from molar to molar will make it more secure and convenient to use. In its passive state, the loop points vertically downward toward the mandibular teeth. A steel ligature is employed to connect the helix to the attachment on the canine, generating an extrusive force.

Two Archwire Technique / Piggyback NiTi Archwires: The two archwire technique, also known as piggyback NiTi archwires, involves utilizing two archwires: a stiffer base archwire and an auxiliary traction archwire (0.014 NiTi). The inherent flexibility and expansive range of NiTi archwires facilitate their early engagement with displaced canines, imparting a gentle, continuous force to encourage the eruption of impacted teeth.[35,36]This technique entails fastening the NiTi archwire to a button or gold chain affixed to the impacted canine. Prior to attachment, the archwire is deflected by approximately 3–4 mm in the direction of the chain. However, akin to elastics, achieving precise directional control over force with NiTiarchwires is also challenging.[31]

Australian Helical Archwire: The Australian Helical Archwire, developed by Hauser C et al,[32]is crafted from Australian Special Plus 0.016-inch wire. This innovative design features three helices, with two helices serving as stops positioned near the brackets of adjacent teeth. These stops function to preserve the space created for the impacted canine. A third helix is strategically placed in the bridge at a lower level, between the stoppers, to enhance resiliency. Activation of this auxiliary is achieved by twisting the ligature connecting the helix to the attachment on the tooth. The incorporation of helices imparts ample elasticity and an extended range of action, while effectively preventing force decay. Notably, the Australian Helical Archwire obviates the need for a stiffer base archwire. As a result, eruptive force can be applied at an earlier stage, thereby reducing the overall treatment duration.

Cantilever Springs:
Cantilever springs constitute a mechanical system featuring a posteriorly fixed anchorage point and an anteriorly free end, which is attached to the impacted tooth. This arrangement facilitates precise force orientation, offering gentle and continuous force application across all three planes while maintaining a low load deflection ratio. Importantly, cantilever springs impose fewer adverse effects on adjacent teeth compared to continuous wires used for orthodontic traction.[17]

The biomechanics of cantilever springs for canine disimpaction are thoroughly elucidated in an article authored by Steven J. Lindauer and Robert J. Isaacson.[37] An exemplary illustration of a one-couple appliance system is the Canine Extrusion Spring. In this configuration, a segment of the spring inserted into the molar tube exerts both a moment and intrusive force, while the free end, secured to the impacted tooth via a point contact, applies extrusive force exclusively.

Nonetheless, this system can lead to certain side effects. These include mesial tipping and intrusion of the first molar, along with the introduction of a third-order moment (buccal root torque) on the extruding canine.To mitigate these effects, connecting molars with a transpalatal arch (TPA) and engaging adjacent teeth with a stiffer archwire are recommended. Additionally, the third-order moment on the canine can be minimized by directing the spring into the canine bracket, rather than relying on a point contact for attachment.

Ballista Spring System: The Ballista Spring System, devised by Harry Jacoby[15] encompasses a cantilever spring fabricated from 0.014, 0.016, or 0.018-inch wire. This innovative system is complemented by an anchorage unit, featuring two molar bands equipped with a triple tube, alongside two first premolars fitted with edgewise brackets. These components are interconnected palatally through a soldered 0.045-inch round wire and a TPA. The cantilever spring configuration comprises a horizontal part that accumulates energy during activation and a vertical portion culminating in a loop at the free end. This loop, in turn, is fastened to the attachment on the impacted crown using elastic thread.

The Ballista Spring System presents several advantages, including the provision of a precisely controlled and continuous force while safeguarding the roots of adjacent teeth from damage. Notably, this system also boasts improved aesthetics, as it eliminates the need for bonding anterior teeth until the impacted tooth's crown fully emerges.

Sectional Archwire with Adjustment and Tie Loops (TMA Fishing Rod)[31,38]: This auxiliary is designed as a sectional archwire crafted from 0.017×0.025-inch Titanium-Molybdenum Alloy (TMA) wire. It encompasses distinct elements: an anterior traction loop positioned at the free end, situated opposite the space intended for the canine; a posterior securing loop in proximity to the molar tube; and an adjustment loop situated 3 to 4 mm mesial to the molar band. Activation of this spring involves buccal and vertical bending in proximity to the securing loop. The utilization of TMA offers the advantage of reducing the load deflection rate and extending the range of action, obviating the need for frequent activations. However, this approach is not without limitations. The potential for distortion of the long cantilever spring and irritation to the buccal mucosa are noteworthy disadvantages of this technique.[34]

Titanium Molybdenum Alloy (TMA) cantilevers and Box loops: The segmented mechanics devised by Patel et al[39] entails the use of 0.017 × 0.025-inch TMA cantilever spring for initial extrusion, followed by a 0.017 × 0.025 inch TMA box loop for canine extrusion and to effectuate both first and second-order corrections. A posterior anchorage unit comprising a 0.019 × 0.026 inch stainless steel segmental wire and a 0.036 inch stainless steel TransPalatal Arch (TPA) is also employed.

K-9 Spring and its modification: The K-9 Spring shares a design similarity with the Ballista Spring, with the distinguishing factor being the material used for its fabrication, ie. 0.017 ×0.025 inches TMA wire. This material selection offers the advantage of facilitating activation twice as much as stainless steel wires, while concurrently delivering a lighter eruptive force. The K-9 Spring generates a subtle yet effective combination of extrusive and distalizing forces on the canine.[40] Shastriet al[41] modified K-9 spring with buccal crown torque in the horizontal arm that is inserted only to the molar and second premolar bracket. This reduces the overall treatment time by incorporation of spring during alignment phase itself and buccal crown torque helps to counter the reactionary force on the anchorage unit.

Kilroy Spring and its Modification: The Kilroy Spring, a straightforward removable auxiliary, is fashioned from 0.016-inch stainless steel wire. It features four helices situated in the same plane to engage with the base archwire, alongside a central vertical loop containing a perpendicular helix within its passive configuration. This spring's versatility is underscored by several attributes. Firstly, the magnitude of the force can be adjusted by bending the vertical loop closer to or away from the impacted tooth. Secondly, the direction of force can be tailored by shortening the vertical loop, achieved by folding the terminal helix back onto itself, thereby introducing more lateral force. Lastly, the Kilroy Spring has the capability to sustain, open, or close the canine space by expanding or constricting the width of the vertical loop.[42]

Kilroy I Spring: Specifically engineered for palatal impaction, this spring exerts both vertical and lateral forces to facilitate effective canine disimpaction. Kilroy II Spring: Tailored for buccally impacted teeth, this spring predominantly delivers vertical eruptive forces, with a lesser emphasis on lateral forces. Sharma et al[43] introduced a modification to the Kilroy Spring. This modification involved increasing the basal width of the vertical loop to ensure its clearance in the palatal direction, thereby eliminating the necessity for deciduous canine extraction during the application of initial traction force for palatally impacted canines. This adjustment holds significant advantages, as it enhances patient aesthetics and preserves the canine space. Utilizing the lateral incisor as anchorage, however, necessitates the application of additional palatal root torque for the lateral incisor, which can lead to root damage by the end of the treatment.[44]

Similarly, canine extrusion auxiliary,[45] modified reverse torquingbegg auxiliary with power arms engaged to the impacted canines and extrusion spring by Oppenhuizen[46]utilizes anterior teeth as anchorage for applying traction force to the impacted canine.

The Easy Cuspid System, developed by Alberto Caprioglio,[47] is a modified version of the Jones Jig. This innovative device comprises a distal arm featuring a soldered double terminal end, encompassing a larger end inserted into a molar headgear tube and a smaller end placed into an auxiliary tube. A hook is positioned at the soldered junction. The mesial arm, fashioned from a soldered 0.017 ×0.025 inch stainless steel wire, incorporates a helix that is bent to create a crossover wire. This helix not only enhances elasticity but also stabilizes the basal archwire, which is threaded through this structure. Extending from the free end of the crossover wire, a second helix is fashioned to secure a chain onto the impacted canine.

Modified Uprighting Spring: The modified uprighting spring, constructed from 0.016-inch AJ Wilcock wire, features a distinctive configuration. This auxiliary includes an active arm culminating in a helix at its free end. The assembly comprises a stem, which is inserted into a molar auxiliary tube, along with a coil positioned perpendicular to the stem.[48]

Shoulder Spring: The Shoulder Spring, developed by Dr. Celebi and Dr. Bicakci[44] is fabricated from 0.016-inch Australian wire. This auxiliary comprises a rectangular frame that encircles both premolar and molar brackets. It also incorporates a helix designed to deliver a consistent force, along with an active arm featuring a hook at its free end. The spring's design is optimized by the inclusion of a stiffer rectangular base archwire, which is threaded through the helix and securely affixed to the bracket system.

Nickel Titanium Closed Coil Spring: The utilization of a stretched 0.009" × 0.041" Nickel Titanium (NiTi) closed coil spring, such as the Jones Jig, can be instrumental in generating a light and continuous extrusive force of approximately 80 grams over an extended duration. In this approach, the loops present at the spring ends are eliminated, and the spring is extended to twice its original resting length. Subsequently, small hooks are fashioned from the ends of the spring and connected to attachments. Despite its benefits, it is important to note that the use of Nickel Titanium Closed Coil Springs does present certain challenges. Difficulties in maintaining oral hygiene, potential soft tissue irritation, and limitations in achieving precise control over tooth movement are among the key drawbacks associated with this approach. These considerations should be carefully weighed when considering the application of NiTi Closed Coil Springs in orthodontic treatments.[49]

Easy-Way-Coil (EWC) System: Michael Schubert[50]introduced the Easy-Way-Coil (EWC) system, which offers a distinctive approach to canine disimpaction. This system incorporates a 3 cm long stainless steel traction closed coil spring. A lingual button with an adhesive base is attached to the spring using ligature wire. One notable advantage of the EWC system in comparison to Nitinol (NiTi) closed coil springs lies in the steel spring's malleability. This characteristic allows for precise bending of the spring's end to form an eyelet, which facilitates seamless connection to the attachment on the impacted tooth.

CONCLUSION

Managing impacted canines poses a significant challenge for orthodontists. Successful management relies on employing appropriate biomechanical techniques and conducting scientific assessments for accurate diagnosis. These factors are pivotal in achieving favorable outcomes, including well-aligned canines within the arch, canine-guided occlusion, aesthetics, proper gingival level, and maintaining periodontal integrity.

In the pursuit of effective canine management, an array of auxiliaries is at the orthodontist's disposal. These auxiliaries are designed to attach to the impacted tooth, offering the necessary force and anchorage for disimpaction. A crucial consideration is the application of gentle and sustained force in the desired direction, ensuring the desired tooth movement while minimizing adverse effects on neighboring teeth. Additionally, it's imperative that the chosen device is both patient-friendly and easy for the operator to manage. Given the diverse options available, selecting the most suitable auxiliary for each individual case is essential. By carefully assessing the unique requirements of each situation, orthodontists can leverage the wide range of canine disimpaction auxiliaries to optimize treatment outcomes.

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