Content available at: https://www.ipinnovative.com/open-access-journals

IP Indian Journal of Orthodontics and Dentofacial Research

Journal homepage: https://www.ijodr.com/

Review Article

Deep bite -An insight

Sonia Chauhan[1,*]

[1]*Dept. of Dental, Deendyal Upadhyay Zonal Hospital, Shimla, Himachal Pradesh, India*

ARTICLE INFO

Article history:
Received 26-06-2023
Accepted 07-08-2023
Available online 08-09-2023

Keywords:
Deepbite
Etiology
Diagnosis
Classification
Treatment modalities

ABSTRACT

Deep bite is one of the most common malocclusion which affects children and even adults leading to a number of oral health problems. Patients with deep bite encounter periodontal and temporomandibular problems. Deep overbite refers to the increase of overlap of maxillary incisors over mandibular incisors beyond normal coverage of 30-40%. There are many factors which lead to the development of deep bite like inherent and acquired factors. Inherent factors like tooth morphology, skeletal patterns, rotation of condyle affects the bite. Acquired factors like muscle habits, loss of posterior tooth support or lateral tongue thrust may affect the bite. Deep bite can be corrected by number of different methods which include intrusion of anterior teeth, extrusion of posterior teeth or a combination of both. In non-growing patients surgical treatment is a suitable option to achieve stable results.This article describes various appliances and their biomechanics involved for correcting deepbite malocclusion

1. Introduction

Class II Division 2 malocclusion was first recorded in 1912 in German literature as " Deckbiss".[1] Deep bite malocclusion is defined as a condition in which maxillary incisors excessively overlap the mandibular incisors vertically in centric occlusion.[2]

Deep overbite refers to coverage of mandibular incisors by maxillary incisors beyond 30-40%.[3] Prevalence of deep bite is 21% worldwide.[4] Several factors lead to development of deep bite which include incisor supraversion, excessive overjet, incisor angulation, molar infraocclusion, muscular habits like tongue thrust and skeletal growth pattern.

Ideal correction of deep bite requires proper diagnosis. Clinically successful results can be obtained with a number of treatment modalities which include intrusion of anterior teeth, extrusion of posterior teeth. For adult patient with skeletal deep bite surgical intervention for repositioning of dentoalveolar segment results in stable treatment outcome.

2. Etiology

The etiology of deep bite is classified into

1. Inherent factors
2. Acquired factors

1. Inherent factors

   (a) Shape of the tooth:[5] Patient with long clinical incisors crowns length than compared to individuals with short clinical length.

   (b) Skeletal Pattern:[6] Skeletal overbite is characterized by horizontal growth pattern. The anterior facial height is short especially the lower third of face whereas the posterior face height is long.

   (c) Condylar growth pattern:[7] Patient with deep bite have an upward and forward growth of condyle with reduced anterior facial height. If the

* *Corresponding author*.
E-mail address: chauhan.sonia2508@gmail.com (S. Chauhan).

https://doi.org/10.18231/j.ijodr.2023.028

condylar growth is greater than the vertical growth of molar area the mandible rotates anticlockwise resulting in deepening of bite.

2. Acquired Factors:[8]
   (a) Muscular Habits: Loss of vertical height of tooth is caused by muscular habits like clenching, hypertonic masticatory muscle activity.
   (b) Loss of posterior supporting teeth: Premature loss of posterior supporting teeth or extraction of molars or premolars without replacement leads to mesial drifting of adjacent teeth into extraction space resulting in bite deepening.
   (c) Lateral tongue thrust: Lateral tongue thrust leads to infraocclusion of posterior teeth which leads to deep bite.

3. Classification

1. Developmental Deep bite[6]
   (a) Dentoalveolar deep bite:
      i. Infraocclusion of molars: Characterized by large inter-occlusal space, lateral tongue thrust and small distance between maxillary and mandibular basal plane.
      ii. Supraocclusion of incisors: Characterized by deep Curve of Spee and less inter-occlusal space.
   (b) b) Skeletal Deep bite: It is of genetic origin. The anterior face height is short while the posterior face height is large. The normal ratio of upper to lower anterior face heightis 2:3 gets altered to 2.2.5 or 2.28.
2. Acquired Deepbit[6]
   It is acquired during the lifetime due to abnormal lateral tongue thrusting habit or due to drifting of the teeth into adjacent extraction space or due to wearing of tooth surface due to bruxism.
3. Akerly Classification[9]
   (a) Type 1: Mandibular incisors impinges against the palatal mucosa.
   (b) Type II: Mandibular incisors impinges into the palatal gingival margin of upper incisors.
   (c) Type III: Both maxillary and mandibular incisors incline lingually and impinges on the lower labial gingival and upper palatal gingival respectively.
   (d) Type IV: Wear facets on the palatal surface of the maxillary incisors and labial surface of mandibular incisors due to impingement of incisors over one another.

4. Diagnosis

Different diagnostic aids are:

1. Clinical examination
2. Study models
3. Cephalograms
4. Photographs

1. Clinical Examination[10]
   (a) Extraoral examination (Natural Head Position)
      i. Patient has short square face.
      ii. Edentulous appearance
      iii. Maxillary incisors hidden behind upper lip while speaking
      iv. Corners of the mouth are below occlusal line
      v. Distinct skin folds lateral to oral commissure
      vi. Posterior part of the face appears wide because of prominent mandibular angles
      vii. Obtuse /Normal nasolabial angle
      viii. Distinct chin button
      ix. Deep mentolabial fold
   (b) Intraoral Examination
      i. Broad maxillary arch
      ii. Flat palatal vault
      iii. Gingival recession with maxillary and mandibular incisorss seen
      iv. Dento-alveolar true deep bite (infraocclusion of molars)
         A. Partially erupted molars
         B. Large inter-occlusal shape
         C. Lateral tongue thrust
      v. Dento-alveolar pseudo deep bite (Over eruption of incisors)
         A. Incisal margin of incisors extend beyond functional occlusion plane
         B. Excessive Curve of Spee
         C. Molars fully erupted
         D. Small inter-occlusal space present
2. Study Models:
   (a) Excessive overbite
   (b) Exaggerated Curve of Spee in lower arch
   (c) Reverse curve of Spee of maxillary occlusal plane
   (d) Flat palatal vault
   (e) Maxillary arch is wider
3. Cephalograms:
   (a) Down Analysis[11] (1948)
      i. Mandibular plane angle - 21.9° ±3.24°
      ii. Y-axis -59.4 °±3.82°
      iii. Interincisal angle -135.4°±5.76In skeletal deep bite the mandibular plane angle and y-axis decreases while interincisal angle inreases.
   (b) Steiner Analysis[11] (1953)
      i. Mandibular Plane angle- 32°

ii. Interincisal angle - 131°
iii. In skeletal deep bite cases mandibular plane angle decreases and interincisal angle increases.

(c) Sassouni[11] (1969)
According to Sassouni each skeletal type is due to a positional deviation or dimensional deviation of skeletal structures.

i. Positional deviation: In deep bite cases the FH plane, the palatal, occlusal and mandibular plane are nearly parallel to each other and they converge far behind the patient's profile.
ii. Dimensional deviation:[12]
A. The posterior facial height is equal to anterior facial height
B. Lower anterior face height is equal to or smaller than the upper face height
C. Facial breadth is equal tototal face height
D. The mandibular symphysisis short vertically and broad anterposteriorly
E. Nasion is deep seated posterior to both frontal and nasal bones.

(d) Burstone Analysis[11] (1979)

i. Skeletal Deep bite- The upper incisor to nasal floor (30.5 ± 2.1 mm), lower incisor to mandibular plane (45 ±2.1 mm), upper molar to nasal floor (26.2 ± 2 mm) and lower molar to mandibular plane (35.8 ± 2.6 mm) value decreases.
ii. Dentoalveolar Pseudo deep bite: The upper incisors and to nasal floor and lower incisor to mandibular plane value increases while in true dentoalveolar deep bite the upper molar to nasal floor and lower molar to mandibular plane measurement decreases.

4. Photographs[13]

(a) Frontal View:

i. Lower third of face height is decreased.
ii. Short, square shaped face
iii. Wide posterior part of face, prominent mandibular angle
iv. Maxillary incisors hidden behind upper lip on smile
v. Upper lip curves downwards
vi. Corners of the mouth are below the occlusal line
vii. Decreased inter labial distance when teeth in centric relation

(b) Profile view:

i. Lower third of face height is decreased
ii. Obtuse naso labial angle
iii. Distinct chin button
iv. Deep mentolabial sulcus
v. Lips are redundant

5. Treatment Considerations[14]

1. Soft tissue Consideration

(a) Interlabial gap: Interlabial gap should be maintained at 2-3 mm with teeth in maximum occlusion. In order to correct a deep bite, extrusion of posterior teeth should only be attempted in case there is no interlabial gap.
(b) Isncision-stomion distance: It should be maintained at 3-4 mm as extrusion of posterior teeth leads to increase in this distance.
(c) Smile line: In patients with gummy smile extrusion of posterior teeth should be avoided to correct deepbite or else it will result in excessive gingival display.
(d) Lip length: In patients with short anatomic lip length the maxillary incisors are intruded to improve upper incisor lip relationship.
(e) Lip Tonicity: Permanent retention of teeth is required in patient with hyperactive upper and lower lip.

2. Skeletal Considerations:
In patients with short anterior lower face height extrusion of molars for correcting deep bite is the choice of treatment. Extrusion of molars in case of long anterior lower face height must be avoided.

6. Functional Consideration

Bite plate is usually used to correct deep overbite in adults by allowing the posterior teeth to extrude. However bite plate should be used cautiously because of undesirable side effects related to TMJ, musculature and poor stability of attained result.

7. Dental Considerations

Intrusion of upto 4 mm of upper incisors can be accomplished without significant root resorption but if more than 4 mm of intrusion is required then it can be combined with intrusion of lower incisors. Periodontal disease should be under control in adult patients before the start of orthodontic treatment.

8. Treatment Modalities

Deep bite can be corrected by the following methods

1. Intrusion of anterior teeth
2. Extrusion of posterior teeth
3. Combination of both
4. Proclination of incisors

5. Surgical

8.1. Removable Appliances:

1. Intrusion of anterior teeth
   (a) Sved bite plane:[15] Sved modified the bite plane to produce intrusion of maxillary and mandibular anterior teeth by covering $1/3^{rd}$ if the labial surface of maxillary anterior teeth with acrylic. The mandibular incisors engages the inclined plane on the palatal surface of maxillary bite plane.
   (b) Rubber Dam Elastics:[16] For intrusion of maxillary incisor an acrylic and wire appliance with hook soldered on the labial wire and cleats embedded in the palatal acrylic portion are retained with the help of $\frac{1}{4}$ inch rubber dam elastics for 3-4 weeks. The elastics should pass over the incisal edges of the maxillary incisors.
   (c) An Essix intrusion appliance:[17] It is made from a 1mm sheet of Essix plastic which is thermoformed over a high quality die stone cast. The sheet should extend 2-3 mm onto the gingiva. Elastic attatchment are made by cutting retentive tabs in plastic with a scalapel or bonding buttons directly to the prepared surface of plastic. Plastic covering is cut away from the teeth intruded.
2. Extrusion of posterior teeth:
   (a) Anterior bite plane: First used by Miller,[18] anterior bite plane is a thickened platform of acrylic, palatal to the upper incisors on which the lower incisor occlude leaving the posterior teeth out of occlusionby 1-2 mm. This appliance has to be used while eating. Growing patient respond better as compared to older patients.
   (b) Posterior Tongue Crib:[15] In case of lateral tongue thrust habit a posterior tongue crib intercepts the lateral tongue thrust by preventing the tongue from inserting into inter occlusal space

8.2. Myofunctional appliances

1. Activator: Originally given by Viggo Andresen[19] in 1908 activator are used in deep overbite cases with infra occlusion of molars by allowing extrusion of molars. This is achieved by loading the palatal surfaces above the area of greatest convexity in maxillary and below the area of greatest convexity in mandible. In case of deep bite due to supraocclusion of incisors, the intrusion of incisors is achieved by loading the incisal edges of anterior teeth with acrylic. The labial bow is active and should be the area of greatest convexity to aid in intrusion of incisors.
2. Bionator**:** Bionator was developed by Wilhelm Balters.[6] Balters reduced the acrylic bulk of activator thereby making it less bulkier to wear. Deep bite due to infra occlusion of molars can be successfully managed with bionator by grinding away of acrylic in the buccal interocclusal region thereby allowing eruption of molars and premolars. It does not work if overbite is due to supra occlusion of incisors
3. Functional Regulator:[19] Functional regulator is a removable tissue born appliance developed by Rolf Frankel. According to him deep overbite due to infreocclusion or lingual tipping of molars is caused due to disturbance in vertical development of molars by the cheeks rather than by tongue. The acrylic buccal shield holds the cheek away and allows spontaneous up righting of molars and premolars and leveling of the curve of Spee.
4. Twin Block:
5. Twin Block was introduced by Scottish orthodontist, William Clark[20] in 1977. It is a two-piece appliance with separate maxillary and mandibular components which incorporates a guide plane that allows forward positioning of mandible. Deep overbite is corrected by trimming the occlusal cover of maxillary block occluso-distally by 1-2 mm to encourage eruption of lower molars and premolars. This prevents lateral tongue thrust and leveling of curve of Spee.

8.3. Orthopedic appliance:[21]

1. Cervical pull appliance which consists of face bow, neck pad and force element is used for correction of deep bite cases. The inner bow engages the buccal tube on maxillary first molar and a vertically downward component of force is generated by an elastic module which engages the outer bow to neck pad. This leads to extrusion and distalizationof molars thereby rotating the mandible in a clockwise direction leading to bite opening. It should be worn 14-16 hours per day.

8.4. Fixed appliance therapy

1. Modified Nance Appliance:[22] Nance Appliance with a bite plane allows immediate bracket placement on lower teeth, maintains vertical dimension in patients with early loss of primary teeth, TMJ cases.
2. Bonded bite plane with composite resin:[23] Composite bonded bite plane can be used in Class I, Class II Div 1 and Class II Div 2. It causes intrusion of maxillary and mandibular molars.

8.5. Correction of deep bite with Begg's technique

1. Anchor bends:[24] 0.016" and 0.018" SS arch wire are used for bite opening, 30-50 ° anchor bend in 0.016"

SS maxillary arch wire and lesser degree of anchor bends in 0.018" SS maxillary arch wire is used for progressive intrusion of central and lateral incisors. The anchor bends are given 3 mm mesial to the molar tube.

2. Gable bend: It is placed distal to canine and maintains bite opening attained in earlier stages of treatment. It causes relative intrusion of canine and progressive intrusion of lateral and central incisors.
3. Hocevar's modification:[25] In this modification bends on both side of canine are given which causes intrusion of central incisor but extrusion of canine and lateral incisors.
4. Kameda's modification:[26] In Kameda's modification both the anchor and gable bends are given causing canine and premolars to extrude while the lateral and central incisors intrude.
5. Magnitude of intrusion force: According to Ricketts[27] the recommended forces for intrusion of incisors and canine is 15-25g and 60g respectively.

8.6. Correction of deep bite with edgewise technique:[28]

1. In order to intrude teeth, 2 bends in the range of 10-15° should be given on either side of the incisors to be intruded in the opposite direction. This will cause the wire segment to lie below the plane of arch wire and then it is raised to engage into the bracket.
2. Correction of deep bite with Pre-adjusted appliance:[29]
3. L F Andrews introduced first preadjusted edgewise appliance in 1970. In 1989, Bennett and McLaughlin modified straight wire appliance. Deep overbite can be effectively controlled with pre adjusted appliance when certain principles are observed.
4. Extrusion should be avoided and anterior bite planes should be used in beginning of treatment in low angle cases. Light initial forces should be used to avoid bite deepening and second molars should be banded from the beginning of treatment. Gentle forces should be used of Class II elastics. Bite opening curves should be used when necessary.

8.7. Correction of deep bite with segmented arch technique

1. Three piece intrusion arch:[30,31] A three piece intrusion arch consists of 0.018 x 0.025 SS segment with 2-3 mm of distal extension below centre of resistance of anterior teeth placed passively in the anterior bracket and 0.017 x 0.025" TMA tipback springs which applies an intrusive force. An intrusive force perpendicular to the anterior segment and applied through centre of resistance of anterior teeth will intrude the incisor segment. If the intrusive force is placed further distally and a small distal force is applied simultaneous intrusion and retraction of anterior teeth occurs.
2. Ricketts utility arch:[32] Intrusion utility arch is made from 0.016 x 0.022" blue elgiloy. In the maxillary utility arch a tip back of 45°, distolingual rotation of 10-20° and an expansion of 1 cm in each side is done. Stabilization of molars is done by use of Quad Helix, lingual arch or transpalatal arch. In mandibular utility arch a 5-10° labial root torque will counteract the forward tipping action with intrusion arches.
3. Mulligan intrusion arch:[33] Mulligan's intrusion arch is made using round 0.016" SS. After leveling the wire is placed with a tip back bends or "V" bends for intrusive action on incisors and extrusive action on molars.
4. Simultaneous intrusion and retratraction appliance-KSIR:[32] It was given by Varun Kalra and is made of 0.019 x 0.025 TMA archwire with closed 7 mm x 2 mm U loops at extraction sites. Its main indication was cases with deep bite and excessive overjet. A 90° V-bend is placed at the level of U-loop between the first molar and canine to prevent tipping into extraction spaces. A 60° V-bend located posterior to the centre of interbracket distance produces clockwise moment on the 1^{st} molar to augment molar anchorage. To prevent the buccal segment from mesiolingual rotation a 20° antirotation bend is placed distal to U-Loop. Thhe loop is activated at every 6-8 week interval and exerts an intrusive force of 125g on anterior segment.
5. The Connecticut Intrusion arch:[34,35] It was fabricated by Ravindra Nanda from NiTi Alloy and is available in 2 sizes 0.016 x 0.022 and 0.017 x 0.025". The CIA is inserted into auxillary molar tube and anteriorly makes a contact point at the incisors. A V-bend just mesial to molar tube exerts an intrusive force of 40-60 gm on incisors.

8.8. Correction of deep bite with equiplan-Quad helix:[36]

1. Dr JMS Pato developed the appliance in 1992 by attaching a planes equiplan to a quad helix or transpalatal bar. This appliance simultaneously expand the palate and open the bite at the same time by intending the anterior teeth and extruding the posterior teeth.

8.9. Lingual arch for intrusion and uprighting lower incisor[37]

1. This appliance consists of 0.036" lower lingual arch soldered to the first molar bands with four elastic chains attached to anterior bridge of lingual arch. If teeth are to be intruded then elastic chain should come off the lingual arch on the labial side.

8.10. Correction of deep bite with mini screw anchorage system[38]

1. To intrude the upper incisors, the miniscrews are placed between the incisors and canines after leveling and alignment in order to maximize the inter radicular space at placement site. To prevent tipping of the upper incisors labially the end of arch wire should be cinched

8.11. Correction of deep bite with magnets[39]

1. Samarium cobalt magnets are used as attracting magnets which help in extruding the posterior segment in deep bite cases. 120g of force is generated which may be controlled by operator by adjusting the air gaps.

8.12. Correction of deep bite with orthodontic and surgical management[40]

Surgical treatment options in deep bite cases are:

1. Orthodontics and inter positional genioplasty.
2. Orthodontics and inferior onlay mandibuloplasty.
3. Orthodontics and mandibular advancement.
4. Orthodontics and total subapical mandibular advancement.
5. Orthodontics and inferior repositioning of maxilla and mandibular advancement.
6. Orthodontics and combined maxillary and mandibular surgery.

9. Retention and Relapse

After completion of orthodontic treatment a maxillary removable retainer with a bite plane is needed for several years to maintain the correction.[13] The maintainance of overbite depends upon torque or axial inclination of incisors. If the maxillary and mandibular incisors are relatively upright they will have a tendency to overerupt after appliance removal.[41] Patients with vertical growth pattern have a lower tendency for relapse as compared to horizontal growth pattern.[42]

10. Conflicts of Interests

The author has no financial interests or conflicts of interests.

11. Source of Funding

None.

References

1. Walkow TM, Peck S. Dental arch width in Class II Div 2 deepbite malocclusion. *Am J Orthod Dentofacial Orthop*. 2002;122(6):608–13. doi:10.1067/mod.2002.129189.
2. Bishara SE. Textbook of Orthodontics. WB Saunders; 2002.
3. Ghafari JG, Macari AT, Haddad RV. Deepbite- Treatment options and challenges. *Semin Orthod*. 2013;19(4):253–66. doi:10.1053/j.sodo.2013.07.005.
4. Lombardo G, Vena F, Negri P, Pagano S, Barilotti C, Paglia L, et al. Worldwide prevalence of malocclusion in the different stages of dentition: A systematic review and meta-analysis. *Eur J Pead Dent*. 2020;21(2):115–22. doi:10.23804/ejpd.2020.21.02.05.
5. Bjork A. Prediction of mandibular growth rotation. *Am J Orthod*. 1969;55(6):585–99. doi:10.1016/0002-9416(69)90036-0.
6. Graber TM, Rakosi T, Petrovic G. Dentofacial Orthopedic with functional appliances. St Louis, Mosby Co; 1985. Available from: https://books.google.com/books/about/Dentofacial_Orthopedics_with_Functional.
7. Schudy FF. The rotation of the mandible resulting from growth: Its implication in orthodontic treatment. *Angle Orthod*. 1965;35(1):36–50.
8. Moyers RE. Handbook of Orthodntics. Mosby, Chicago; 1988.
9. Nasry HA, Barclay SC. Periodontal lesion associated with deep traumatic overbite. *Br Dent J*. 2006;200(10):557–61.
10. Nanda SK. Growth patterns in subjects with long and short faces. *Am J Orthod Dentofac Orthop*. 1990;98(3):247–58.
11. Athanasiou A. Orthodontic Cephalometry. Mosby-Wolfe; 1995.
12. Sassouni V. A classification of skeletal facial types. *Am J Orthod*. 1969;55(2):109–23.
13. Proffit WR, Fields HW, David MS. . Contempotrary Orthodontics.5th edn. Mosby-Elsevier; 2013.
14. Nanda R. Biomechanics and esthetic stratergies in clinical Orthodontics. Elsevier Saunders publishers; 2005. p. 31–155.
15. Muir JD, Reed RT. Biomechanics and esthetic stratergies in clinical Orthodontics. Elsevier Saunders publishers; 1979.
16. Arici S. An easy way of intruding an upper central incisor. *Br Dent J*. 2004;197(9):543–4.
17. Armbruster P, Sheridan JJ, Nguyen P. An Essix intrusion appliance. *J Clin Orthod*. 2003;37(8):412–22.
18. Geiger A, Hirshfeld L. Minor tooth movements in general practice. Mosby Co; 1966.
19. Graber TM, Neuman B. Removable Orthodontic appliances. Philadelphia: WB Saunders Co; 1984.
20. Clark WJ. Twin Block Functional Therapy application in Dentofacial Orthopedic. Mosby-Wolfe; 1995.
21. Baumrind SE, Molthen R, Miller WE. Distal displacement of the maxilla and the upper first molar. *Am J Orthod*. 1979;75(6):630–40. doi:10.1016/0002-9416(79)90095-2.
22. Northcutt ME. The bite plate Nance appliance. *J Clin Orthod*. 1996;30:396–400.
23. Philippe J. Treatment of deep bite with bonded biteplanes. *J Clin Orthod*. 1996;30(7):396–400.
24. Jayade VP. Refined Begg's for Modern Times. Hubli, India: A.V. Jayade; 2001.
25. Hocevar R. Orthodontic forces system: individualized treatment with open minded "begg" technique amj. *Am J Orthod*. 1982;81:277–91.
26. Kameda A. The Begg technique in Japan 1961-1979. *Am J Orthod*. 1982;81(3):209–27.
27. Ricketts RM, Bench RW, Gugino CF. Bioprogressive therapy. Denver: Rocky Mountain Orthodontics; 1980.
28. Renfroe EW. Edgewise technique. Lea and Febiger Philadelphia; 1975.
29. Bennett J, Mclaughlin R. Management of deepbite with a preadjusted appliance system. *J Clin Orthod*. 1990;24(11):684–96.
30. Shroff B, Yoon WM, Lindauer SJ, Burstone CJ. Simultaneous intrusion and retraction using a three piece base arch. *Angle Orthod*. 1997;67(7):455–61. doi:10.1043/0003-3219(1997)067<0455:SIARUA>2.3.CO;2.
31. Shroff B, Lindauer SJ, Burstone CJ. Segmented approach to simultaneous intrusion and space closure: biomechanics of the three-piece base arch appliance. *Am J Orthod Dentofacial Orthop*. 1995;107(2):136–43. doi:10.1016/s0889-5406(95)70128-1.
32. Bench RW, Gugino CF, Hilgers JJ. Bioprogressive therapy mechanics. *J Clin Orthod*. 1978;12(3):192–207.
33. Mulligan Common sense mechanics.Part -12. *J Clin Orthod*. 1980;14(8):546–53.

34. Nanda R, Marzban R, Kuhlberg A. The Connecticut intrusion Arch. *J Clin Orthod*. 1998;35(12):708–15.
35. Kalra V. Simultaneous intrusion and retraction of the anterior teeth. *J Clin Orthod*. 1998;35(9):535–40.
36. Pato JMS, Saboia SVM, Pato BJM, Pato JMM. The Equiplan- Quad Helix combination in deep bite cases. *J Clin Orthod*. 2002;36(8):434–6.
37. Senior W. A lingual arch for intruding and uprightinglower incisors. *J Clin Orthod*. 2003;37(6):302–6.
38. Carano A, Velo S, Corvatic I, Poggio P. Mini-screw Anchorage System in maxillary alveolar bone. *J Ind Orthod Soc*. 2004;37:74–84.
39. Blechman AM. Magnetic force systems in orthodontics. *Am J Orthod*. 1985;87(3):201–10. doi:10.1016/0002-9416(85)90041-7.
40. Proffit WR, White RP. Surgical Orthodontic treatment. St. Louis: Mosby-Year Book; 1990.
41. Zachrisson BU. Important aspect of long term stability. *J Clin Orthod*. 1997;31(9):562–83.
42. Pollard D, Akyalcin S, Wiltshire WA, Wellington J. Relapse of Orthodontically corrected deepbite in accordance with growth pattern. *Am J Orthod and Dentofac Orthop*. 2012;141(4):477–83.

Author biography

Sonia Chauhan, Medical Officer

Cite this article: Chauhan S. Deep bite -An insight. *IP Indian J Orthod Dentofacial Res* 2023;9(3):152-158.