Single tooth cross bite correction using piggy back wire technique: A case report

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ABSTRACT
Crossbite can be treated using both removable and fixed appliances. The report of acase using the Piggy Back wire approach to treat an anterior single tooth in a crossbitethat is locked out of arch form with a simple fixed partial appliance is covered in thispaper. Orthodontic treatment was initiated by creating space for the locked out incisorusing open coil spring and further corrected using MBT brackets and nitinol archwirefor alignment. Treatment objectives were achieved, and esthetics and occlusion weremaintainedpostoperatively.Treatmentobjectiveswereobtainedwithinashortdurationusingthistechnique,andthere wasanimprovementinpatients'smile.

Keywords: Anterior crossbite, Piggy back technique, fixed partial appliance, NiTiwire,opencoil spring

INTRODUCTION
A malocclusion in which one or more of the maxillary incisors occlude palatally withthemandibularincisors is known asananteriorcrossbite.[1]

Crossbite can be of dental or skeletal in origin. Early crossbite correction has alwaysbeen given a greater weightage and is recommended because of the fact that it willpreventfurthercomplicationsinmalocclusionandalsoifleftuntreatedwouldnecessitatemoreextensivetreatment.[2]

The use of tongue blades, reversed stainless steel crowns, fixed acrylic planes, bondedresincomposite slopes, and removable acrylic appliances with finger springs are just afewofthetreatmentoptions thathavebeensuggestedto correctanteriordentalcrossbite.[3–5]

Lee[6]summarizedfourconsiderationstomake beforedecidingatreatmentoption:

- Sufficientspace inthearchtorepositionthetooth
- Enoughoverbitetoholdthetoothinpositionafter correction
- Apicalpositionofthetoothincrossbiteisthesameasitwouldbeinnormalocclusion
- AClassIocclusion

In this report, the Piggy Back Technique is used to correctanterior single toothcrossbite.

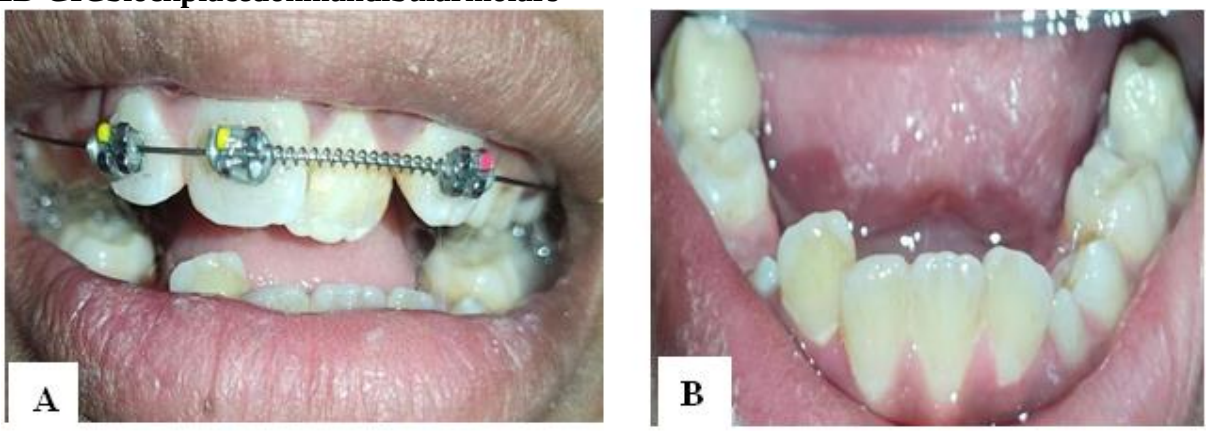
CASEREPORT
A 12 yr. old boy was referred to the Department of Pedodontics and PreventiveDentistry, with a chief complaint of irregular teeth and unaesthetic appearance. Hismedical and dental history was non- contributory. There was no history of an overretained primary tooth or a supernumerary tooth. Clinical examination revealed astraight profile with mild convex

profile. Intra oral evaluation showed Class I molarrelation bilaterally with mild crowding present in relation to lower anterior and 21 incrossbites with 31 and 32(Fig1)

Fig1-Pretreatmentintraoralphotograph

Themaxillaryandmandibulardentalmidlinewascoincidentwiththefacialmidline.A panoramic radiograph showed no evidence of bone or dental pathology and lateralcephalometricradiographicviewshowednoevidenceofbasalproblembetweenmandibular and maxillary arches.Space analysis showed that the maxillary arch had 2mm archlengthdiscrepancy.Thus, the best treatmentoption wasto create 2 mmspace for the maxillary left central incisor and correct the misalignment. Treatmentwas started in the maxillary arch by bonding MBT (preadjusted edgewise) brackets tothemaxillaryanteriorteethandmolarbandswithpreweldedbuccaltubetothemaxillary first molars. 0.016 NITI archwire was given for initial alignment of teeth.NiTi open coil springs were then cut in length that was twice longer than the distancebetween maxillary rightcentralincisor and leftlateralincisorand incorporated intothewiretoregain thelostspace.(Fig 2A)

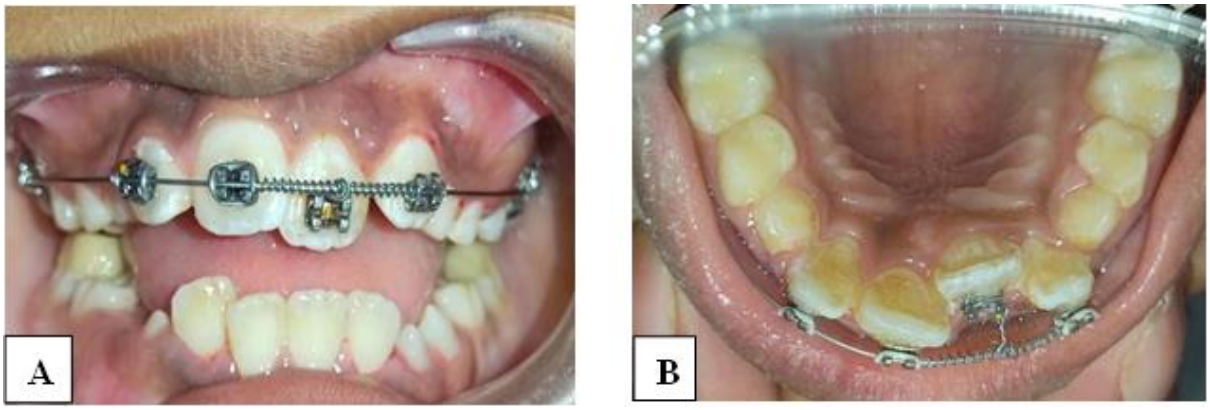
Fig 2A-Placement of brackets and wire and creating space for 21 using open coilspring, 2B-GICblockplacedonmandibularmolars



A GIC block was placed on the moreover posterior to raise the bite and clear theblocked incisor of any occlusal interference and the patient was instructed to wear theappliance full time.(Fig 2B)

After space creation, the maxillary left central incisor was also bonded with MBTbracket, and a 0.016” thermal activate nickel titanium archwire was used for labialmovementoftheincisor.(Fig 3A,B)

Fig3(A,B)-Engaging21usingNiTi0.016”wireafter spacecreation

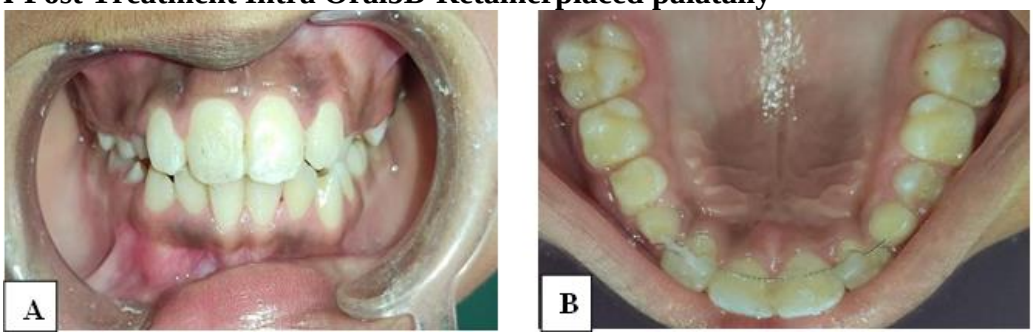


A 0.019”x 0.025” ss wire was again placed as the base wire and a 0.014” HANT wasplaced from canine to canine in the maxillary arch. The 21 was bonded with thebracket and the HANT wire was tied on the bracket with an elastic module. Therigidity of the heavyss wirewasusedfor thestabilization of thearchwhile theflexible HANT wire pulls the palatally placed incisor outward to the occlusion arch(Fig 4). This is called the Piggy back wire technique, where two wires are placed oneheavier andtheotherlighter wireinthebracket slot.

Fig 4- Piggy Back Wire With 0.019x 0.025” ss, as a main arch wire And 012 nitiPlacedadditionallyWith theInvolvementof21.

Both the wires properties are used in unison to achieve the latter into position. After 6weeks the incisor was brought into position. Final alignment was done with 0.016 nitifollowedby16x25nitiandthen17x25ssforthecorrectcrownandrootpositioning.Thetreatment wascompletedin28 weeks(Fig5A,B)

Fig 5 A-Post Treatment Intra Oral5B-Retainerplaced palatally



Follow up of 6 months was done and no clinical or radiographic problems wereobserved.

DISCUSSION

An improper labiolingual connection between one or more maxillary and mandibularincisor teeth is referred to as anterior crossbite. Both removable and fixed appliancescan be used to

treat crossbites that have dental origins. However, correcting incisorcrossbite with removable appliances requires a lot of patient cooperation and takeslongertimethan with fixedappliances. The fixed partial appliance in this case report made use of preadjusted MBT bracketswhichhavetheadvantageofbeingversatile,deliveringlightcontinuousforces.Besides,lack of space for the labial movement of the incisor in crossbite added to theuse of open coil spring. NiTi springs display excellent spring back and a long range ofsuperelasticity with a constant load for a large deflection, thereby delivering a morecontinuous force.[7]Once space is created, brackets will move the blockedout toothinto alignment without arch form distortion.Disocclusion beyond freeway space isnecessary for labial movement of an upper central incisor with the help of posteriorbiteplane.NiTiarchwireswereusedmainlybecauseofversatilepropertiesofsuperelasticity and shape memory which are helpful to align severely malpositionedteeth.[8]

The appliance used here provides complete control over the arch form and allowsthree-dimensional controlontheteethinvolvedincrossbitewiththehelpofacontinuousarchwire.Asaresult,itismoreeffectiveandofferspropertoothpositioningandarchalignment.Additionally,nolabcostisrequired,and simplyrequires chairside time to fix the appliance. Patient cooperation is necessary duringplacement and removal of this appliance, additionally for maintenance. The otherdisadvantages of removable appliances like they allow only for tipping movements ofteeth,which interferes in speech, eating, as well incorrect tooth movement caused byimproperactivationcanbeovercome with afixed appliance.[9]

The casereported heretook 6 months forcrossbite correction. Given that the teethwas locked out of arch form the use of open coil springs offers us with a quick andcomfortable approach compared to disking the teeth or use of expansion screws andotherremovableappliances.Inaddition,theuseofprefabricatedandpreadjustedMBT brackets used judiciously along with NiTi wires can serve as an innovativeprovisionin thefieldofinterceptiveorthodontics.

CONCLUSION

The results were acceptable and steady while the treatment objectives were obtainedwithin a short duration using this technique and there was an improvement in patientssmile.Based on the situation at hand the operator with his/her unique knowledge mustchoosethe techniquewhichwould gettheresultconferringminimal problems.

CLINICAL SIGNIFICANCE

No technique is best or perfect.After having carefully weighed the pros and cons, thistreatmentoptionisasimpleandeffectivemethodtocorrectanteriorcrossbite,particularlyforteethlocked out ofthearchform.

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Nil.

CONFLICTSOFINTEREST

Thereare noconflictsofinterest.

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