Casereport

SURGICALREMOVALOFTRANSMIGRATED MANDIBULARCANINE:ACASEREPORT

ABSTRACT

Introduction: Mandibular canine transmigration is a rare occurrence and is an occasional diagnosis. Themajority of patients have no symptoms, and these canines are frequently discovered during a radiologicalexamination prior to orthodontic treatment. The exact aetiology is unknown, and treatment of impactedtransmigrated canine can be challenging for a practitioner if it is diagnosed at later stages. Early detectionof impacted canines and prompt treatment is utmost important to ensure facial harmony and improvedfunction.

Aims: To determine the management of rare case of an impacted mandibular canine that hadtransmigratedtotheoppositeside.

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Methodology: A patient with transmigrated mandibular canine with crowding in mandibular anterior teethwhereorthodonticrepositioningoftoothwasnotpossible,wassurgicallyremovedbyanintraoralapproachfollowed by placement of Platelet Rich Fibrin (PRF) in the defect and that was followed by orthodontictreatment.

Results: PRF placed in the defect enhanced the healing process as PRF is rich in growth factors thatpromotesearlyhealingandboneformation.

Conclusion: Therarephenomenonoftransmigrationofthemandibularcaninecrossingthemandibular midline should be carefully evaluated and proper treatment modality according to the case should beconsidered for the management. Early detection and treatment is necessary to preserve adjoining tissues,and dentition, resulting in improved aesthetic and function. Surgical removal of the transmigrated canineunderlocalanaesthesiaappearstobethebest formoftreatment

Keywords:Transmigration,MandibularCanine,SurgicalExtraction,Platelet RichFibrin(PRF)

1.INTRODUCTION

Toothimpaction,translocation,andtransmigrationcanoccurwhenteethdonotemergeintheproperplacein thedentalarch.An uneruptedtoothmaymigratetoalocationsomedistanceawayfromwhereitformed,butit

usuallyremainsonthesamesideofthearch.Theonlytoothinthedentalarchthathasbeenreportedtomigrate acrossthemidlineisthe mandibularpermanentcanine.[1]

Theterm"transmigration"wascoinedbyAndoetal.Thisappearstobethemostappropriatephrase. Transmigrationwasdefinedby Tarsitanoetal.asthephenomenonofanuneruptedmandibularcaninecrossing the midline. Joshi believed that the predilection of a canine to cross the barrier of the mandibular midline suture was more important than the distance travelled. Furthermore, the stage of transmigration of the tooth at the time of examination influences the distance travelled.[3]

In theirclinicalpractice,oralandmaxillofacialsurgeonscommonlyencountersuchclinicalentities.Caninesare themostimportantandfoundationalteethofthedentaljawsinthehumandentition.Theyareessentialfor maintainingthebeauty andfunctionalityof theface,thusanychangeintheireruptionisveryconcerningtothe patient.[2]

Transmigratedcaninesmaypersistasimpactedandremainasymptomatic,ortheymaycauserootresorption ofneighbouringteeth,causingdiscomfort,pain,andneuralgicsymptomsinthepatient.[3]Theincidenceof impactedmandibularcaninesis20timeslowerthanthatofmaxillarycanines.Theprevalenceoftransmigrated caninesinthemandiblerangesfrom0.14%to0.31%.[4]Clinicaloutcomesassociatedwithcanine transmigration includeatypicalretentionofmandibulardeciduouscaninesortheabsenceofmandibularpermanentcaninesin thedentalarch. Themajorityof thetime,thetransmigratedcanineswerelyinghorizontallybelow theapicesof theanteriorteeth.[5]Thispaperdescribesanuniqueexampleoftransmigratedmandibularcanineanditssurgical treatment.

2.CASEREPORT:

A15yearsoldfemalepatientwasreferredfromdepartmentoforthodonticsanddentofacialorthopaedicsin associationofradiographicfindingofhorizontallyimpactedpermanentcanineseekingorthodontictreatment.On clinicalexamination,therewasnoobviousfacialasymmetry,andTMJmovementswerewithinnormallimitswith adequatemouthopening.

Intraoral examinationrevealedoverretaineddeciduouscanineonlowerdentitiononrightsideofthejawwith allfourthirdmolarsmissingsidewithclassImolarrelationshipandanteriordeepbite,therewasnopainand tendernessonpalpation.Therewerenosignificantfindingsinthedentalormedicalhistories.

Apanoramicradiographrevealedimpacted43inmidlineofmandible.Conebeamcomputedtomography (CBCT)wasrecommendedtodeterminetheexactlocationofthemandibularcanine relativetoitsadjacenttooth andtoplanfuturetreatment.CBCTrevealedahorizontallytransmigratedmandibularrightcanine,withthecrown

passingthemidlineandapproachingtheoppositesidecanineandlyinghorizontallybelowtheapicesofthe mandibularanteriorteeth labially.

Thereweretwosurgicaloptions:anextraoralapproachthroughthelowerborderofthemandibleoranintraoral labialapproachthroughthemucobuccalfold.Becauseanextra-oralapproachwouldrequireasub-mental incision of at least an inch in length and was aesthetically unsuitable, the intraoral labial approach was .The chosen.Intraoralmethodappearedtobemoreconservative.Beforetheprocedure,thepatientwasgiven1gof Amoxicillinorallyasaprecaution.Localanaesthesiacontaining2%lignocaineand1:80000adrenalinewas injectedasaLeftinferioralveolarnerveblockusingsterileprotocols.Ano.15bladewasusedtomakean incisionfrom1stpremolaronrightsideto2ndpremolaronleftside,andafullthicknessmucoperiostealflapwas reflected.Thesymphysisregionwasexposedall thewaytothelowerborderofmandible.

Thebonewascutwitharoundburno.4,andawindowwascreated toexposethecrownofthecanine,followed bysectioningofthetoothbeneathwithastraightburtillthecement-enameljunction.Thecrownwasdividedand luxated,removedfirst,followedbytheremovalof therootwithminorluxation.Copiousirrigationwithbetadine andnormal salinewasdonetoflushtheemptysocket.Dentalfollicleassociatedwiththeimpactedcaninewas thoroughlyremovedandemptysocketwasinspectedfor anyremnants.

Meanwhile,patientbloodwasdrawnfromtherightante-cubitalveinandcentrifugedat10,000rpmfor10minutes toproducePlateletrichfibrin(PRF),whichwastheninfusedintothedefectcreatedandsurgicalclosurewas performedwith3-0silk andpressuredressingwasadministeredorally.Thepatientwasprescribedanalgesics forthreedays,withintermittenticeapplicationfortheinitial24hours.Theswellingandpainwasminimal3days postsurgery.Theremovalofthesuturesontheseventhpost-operativedayrevealedgoodhealingwithnopost-operativecomplications. Thepatientreceivedorthodontic treatment,anda 1-month post-operative orthopantomogramrevealedagoodamountofboneatthedefect site,withon-goingorthodontictreatmentand healthytissue.

Figureno1:Preoperativeintra-oralview

Figureno.2:PreoperativeOPGshowingTransmigratedCanine

Figureno3:Intraoralexposureofcanine

Figureno. 4:Extractedmandibularimpactedcanine

Figureno.5:Emptysocket

Figureno6: BloodwithdrawnforPRF

Figureno7:PRF

Figureno8:Suturesplaced

Figureno9:Postoperative1st day

Figureno10:Postoperative3rd day

Figureno.11:1st monthpost-operativeorthopantogram

DISCUSSION:

Caninesareconsideredtoplaysignificantaestheticandfunctionalrolesin humandentition.Impaction, translocation,and, inparticular,transmigrationinvolvingmandibularcaninesareuncommon.Thereisrelatively littleresearchonmandibularcanineimpactions.Therehavebeenfewreferencestodiagnosticcriteriaorsurgical managementoftheseteeth.Thescarcityoftheseimpactionsismostlikely toblameforthescarcity ofmaterial inthisarea.[2,6]

Panoramicradiographs,inadditiontoocclusal radiographs,areroutinelyrecommendedtodetecttransmigrated canines.Otherinvestigationmethodsincludelateralcephalograms,CBCT,and,inrarecases,computed tomography(CT).WiththeintroductionofCBCTintothefieldofdentistry,itisnowpossibletoaccurately localiseimpacted caninesand associated vitalstructures,aswellasdetectrootresorptionofadjacent teeth.[7]

Mupparapuproposedaclassification systemfortransmigratedteeth,categorisingthem intofivetypesbasedon thepositionofthe teeth inthejawandthepatternofmigration.

• Type 1: Canine impacted mesioangularly across the midline, labial, or lingual to the anterior teeth with thecrownportionoftoothcrossingthemidline.

•Type2:Caninehorizontallyimpactednear theinferior borderofthemandiblebelowtheapicesoftheincisors.

•Type3:Canineeruptedeithermesialor distaltotheoppositecanine

•Type4:Caninehorizontallyimpactedneartheinferiorborderofthemandiblebelowtheapicesofthepremolarorm olarontheoppositeside.

•Type5:Canineispositionedverticallyinthemiddlewiththelongaxisofthetoothcrossingthemidline

Followingthis classification,ourcasefallsintothetype2category.[8]

Themajorityofthetime,transmigratedcaninesareasymptomatic,thoughfollicularcystdevelopment surroundingtheimpactedtooth, chronicinfection, andfistulaformationhavebeendocumented.[9]Inourcase,the patientwasaccidentallydiagnosedwith impactedcaninedespitetheabsenceofclinicalsymptoms.

To someextent,thepersistentretentionoftheprimarycanineisaconsistentsignthatresultsinthedetectionof itsimpactedpermanentsuccessor.Theleftcanineismoreaffectedthantherightcanine,andfemalesaremore likelytobeaffectedthanmales. AccordingtoJoshietal,therootresorptionoftheprimarycanineiscomparativelyslowduetotheabsenceofthedeveloping permanentmandibularcaninebeneaththeprimary canine, asourpatienthadretaineddeciduouscanineontherightsideofthemandible.[3]

Thenervesupplyfromtheareaoforiginisretainedby thetransmigratedcanine.Asaresult,anaesthetizingthe nerveoftheinvolvedsidetowheretheimpactedcanineislocatedismandatory,especiallyunderlocal anaesthesia.Henceforththis justifiesadministrationofleftinferior alveolarnerveblockinourpatient.[2]

Iftransmigratedcanineisdiscovered at alatestage,management becomesextremelydifficult.Treatmentoptions includeorthodonticrepositioning,surgicalextractionoftheabnormallypositionedcanine,toothtransplantation, andsurgicallyexposingthecaninewithorthodonticalignment.[10,11]Becausethemandibulararchwascrowdedin ourcase,andthepositionofthetransmigratedcaninewasnearthelowerborderofthepatient'smandible, orthodonticrepositioningwasnotanoption,sosurgicalremovalofthetransmigratedteethwasthetreatmentof choice.Henceforththetransmigratedwassurgicallyremoved,andthedefectsitewasinfusedwithPRFforfaster healing.PRF containsvariousgrowth factorsthatpromoteearlyhealingandrapidboneformation.Becauseour patientwasyoungandrequiredimmediatetreatment,werecommendedthistreatmentasthebestavailableoption.

CONCLUSION:

Theerraticandelusivephenomenonoftransmigrationofthemandibularcaninecrossingthemandibularmidlineis described in the dental literature. Some of the previously reported cases of transmigration canine in whichextractionofthecanine was electedastreatmentofchoiceare as follows:

A caseofbilateralcaninetransmigrationwithkissingphenomenonwasdescribed,whichwastreatedsurgically andyieldedexcellentresultsbyincorporatingPlateletRichFibrinalongwithboneallograftintheosseousdefect, aidingboneregenerationandhealingwhichissimilartothiscase,asPRFisusedaloneinthiscasetoaidbone regeneration.[12]

Inacasesequence,sevencasesofcaninetransmigrationwasreporteddduringorthodontictreatment,oneofwhich involvedthemaxilla.Apanoramicradiographisanessentialtoolintheearlydiagnosisoftransmigrationand wasrecommendedincasesofretaineddeciduousormissingteethforproperpatientmanagement.Itwasalso concludedthatintransmigrationcases,conebeamcomputedtomographycanhelpassessthree-dimensional location,labialandlingualdisplacement,androotresorption.[13]

Inacaseseries,clinicalandradiologicalcharacteristicsoftransmigratedcaninesinaSpanishpopulationwas evaluated,intotal,52patientshadtransmigratedcanines,resultingina0.76%prevalence.Therewere28women and24 meninthissample.Whenatransmigratedcaninewasfound,aCBCTscanwasperformedto evaluatethe clinicalandradiologicalvariables associatedwithcaninetransmigration.Theleftwas themostcommonsideof transmigrationascomparedtotherightside.AccordingtotheMupparapuclassification,correspondedtotypeIV

(42.30%), type II (36.53%), type I (15.38%), and type V (5.76%), with no type III transmigrations found. Only17.30% of cases had clinical manifestations, and 11.53% of radiological findings revealed the presence of toothcysts,whichwereconfirmedbyhistopathologicalstudies.[14]

Aconebeamcomputedtomographystudyconductedinthe past,wasto examineand evaluate themaxillaryand mandibularimpactedandtransmigrantcanines,theirrelationship withneighboringtissuesandpathology.itwas concludedthattransmigrationincidencewasstatisticallyhigherinthelowerjawascomparedtotheupperjaw. Incasesofimpactedortransmigratedcaninealongwithadetailedclinicalexamination,CBCTisofagreat importanceforcorrecttreatmentplanningandminimizingfuturecomplications afterthesurgicalremovalofthe impactedcanine.[15] Radiographic examination using panoramic radiographs is essential for diagnosing impactedcanines, and newer technologies such as CBCT make it very effective for precisely diagnosing transmigratedcanines.

Acaseof transmigratedcanineassociatedwiththedentigerouscystwasreportedthatdevelopsinthecanineof animpacted,embedded,unerupted,ordevelopingtooth.Theradiographicevaluation,wasprimarilybasedonthe panoramicradiograph,tocorrectlydiagnosethecaseofdentigerouscyst.Treatmentofchoiceforthisreported case wasearlydetection,surgicalremovaloftransmigratedcanine andcystic enucleation.[16]

Earlydetectionandtreatmenthelptopreservesuchcanines,adjoiningtissues,anddentition,resultinginimprovedaesthetic and function. Furthermore, the canine occasionally migrateswithoutany pathology, but in rare cases, acystorodontomesupplementssuchteeth.Theaetiologyofthisphenomenonisunknown.Inthemajorityofcases,surgical removal of the transmigrated canine under local anaesthesiaappearstobe the best form of treatment. Acompletediagnosticandtherapeuticmethod, as wellas sound.

CONSENT:

Asperinternationalstandardoruniversitystandard,patient(s)written consenthasbeencollected and preserved bytheauthor(s).

Ethical Approval:

As per international standard or university standard guideline participant consent and ethical approval has been collected and preserved by the authors.

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