Case Series

MAGNETICRESONANCEIMAGINGINDIAGNOSISANDCLASSIFICATIONOFMULLERIAN DUCT ANOMALIES: CASE SERIES

ABSTRACT

Background: Mullerian duct anomalies (MDAs) arise from the aberrant development of the uterus, cervix, and vagina, impacting the potential forsuccessfulconceptionandfull-termpregnancy.Thiscategoryencompassesadiverserangeofdevelopmentaldefects,leadingtoaspectrumofclinicalpresentations such as amenorrhea, infertility, recurrent miscarriages, intrauterine growth retardation, malposition of the fetus, preterm labor, andretainedplacenta.

Case(s): Inthisstudy,wepresent17casesofMDAwithawidearrayofclinicalmanifestations.Thevariedsymptomsincludedamenorrhea,infertility,repeated miscarriages, intrauterine growth retardation, malposition of the fetus, preterm labor, and retained placenta. Accurate categorization ofthesecasesiscrucialfordeterminingtheappropriatesurgicalintervention.Whileultrasonographyaidsintheinitialdiagnosisof MDA,ourfocusonaccurate classification necessitates the use of magnetic resonance imaging (MRI).

Conclusion: Our findings underscore the significance of MRI in precisely categorizing MDA, and facilitating effective management strategies. The17casespresenteddemonstratethediversespectrumofMDAmanifestations,emphasizingtheneedfortailoredsurgicalinterventionsforsuccessfulconception and optimal pregnancy outcomes. The use of MRI proves instrumental in guiding clinical decisions, offering a comprehensive understandingof MDA, and informing targeted interventions to enhance reproductive success.

Keywords: Magneticresonanceimaging,Mullerianductanomalies,Ultrasonography.

INTRODUCTION

Thepairofmullerianductsinfemalesisresponsibleforthedevelopmentofthefemalereproductivesystem,namely,fallopiantubes,uterus,cervix,andupperpartofthevagina.Incaseswherethereisabsenceorimpairedfusion(partial or complete) of the mullerian ducts, a number of developmentaldefects may arise [1], known together as mullerian duct anomalies (MDA).Developmental defects of the urinary tract, including renal agenesis, areoftenassociatedwithMDA[1-3].PatientswithMDAmightpresentwithdiversetypesofsymptomsdependingonthedevelopmentaldefect(s),ranging from primary amenorrhea to infertility [1-3]. Infertility andamenorrhea are the two most common symptoms for which patientsseek medical attention [4]. Although ultrasonography (USG) can diagnosedevelopmental defects to some extent, for exact identification of thedevelopmentaldefectsmagneticresonanceimaging(MRI)isessential,asitwouldpreventunnecessarylaparotomiesandsurgeries.BesidesUSG,hysterosalpingography(HSG)canberecommended;however, exposureofthepatienttocontrastmaterialsandradiation,andpoorcapacityofHSGto delineate the true extent of the developmental defects has led to limitedutility of HSG in the diagnosis of MDA [1-3].

Inrecentyears,MRIhasrevolutionizedthediagnosisofMDA.Ithas proven its worth as a powerful tool to correctly characterizedevelopmentaldefectsandtodelineatetheanatomicalrelationshipof the different organs of the female reproductive system with thesurrounding other structures (especially the urinary tracts) [1,4,5].Here,wepresent17casesofMDAwithdiversedevelopmentaldefects.

CASE DISCUSSION

Case 1

A 17-year-old female presented at the gynecology department withcomplaintsofprimaryamenorrheawithnohistoryofcyclicalpain abdomen.Shewasadvisedscreening USG which showed absence of uterus with normal bilateral ovaries. Next, MRI was advised. MRIscanning revealed aplastic uterus with partial vaginal agenesis andcomplete cervical agenesis (European Society of Human Reproductionand Embryology [ESHRE] U5a C4 V4). The patient was advised toundergo vaginoplasty by the gynecologists.

Case 2

A 24-year-old female with repeated history of spontaneous abortionswith the normal menstrual history presented at the gynecologydepartment.OnUSGscreening,twoseparateendometrialcavitieswithpossibility of bicornuate/septate uterus were revealed. Next, on MRI,a scan bicornuate uterus with a common cervical and vaginal canalwas made (ESHRE U3bC0V0) (Fig. 1). Patient was advised to undergoseptoplasty by the gynecologists.

Case 3

A 23-year-old female with a history of primary infertility for 2 yearspresented at the gynecology department. USG screening showed twoseparate endometrial cavities with possibility of bicornuate/septateuterus with a septate vagina. MRI scan revealed complete septateuterus with partial septate cervix with non-obstructive longitudinalvaginalseptum(ESHREU2bC1V1).Thepatientwasadvisedto undergoseptoplastybythegynecologists.Within2monthsoftheprocedure,thepatientconceived.

Case 4

A29-year-oldfemalewithahistoryofspontaneousmiscarriagesfor3yearsonUSGscreeningwasfoundtohavetwoseparateendometrialcavitieswithpossibility ofbicornuate/septateuteruswithtwoseparatecervix and vagina. MRI scanning revealed a complete septate uteruswithtwocervicesandtwovaginas(ESHREU2bC2V1).Thepatient was

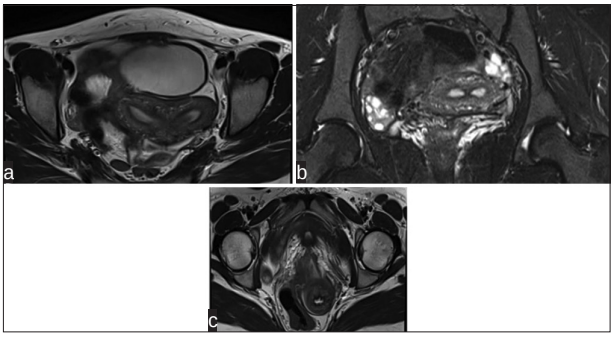

Fig. 1: (a) Axial T2-weighted image showing two separateendometrialcavitieswithincreasedinter-cornualdistanceandobtuseanglebetweentheuterinehornss/oBicornuate uterus. (b) AxialT2-weightedimageshowingnormalbilateralovariesand separate endometrial cavities as described. (c) Axial T2-weightedimageshowingacommoncervicalcanal.Acommon vaginalcanalwasalsonotedEuropeanSocietyofHumanReproduction and Embryology in this patient U3BC0V0

advisedtoundergoseptoplasty,cervicoplasty,andvaginoplastybythegynecologists. An extensive surgery was done successfully and post-procedure the patient conceived within 6 months.

Case 5

A 22-year-old female with ahistoryofprimaryamenorrheawith historyofcyclicalpainabdomen,onUSGscreening,showedthepossibilityoftwoseparate endometrial cavities bicornuate/septate uterus. Hematometraandleftovarianhemorrhagiccystswerealsodiagnosed.MRI scanningrevealed a partial septate uterus with a normal cervix and obstructingobliquevaginalseptumvaginaswithhematometra,hematosalpinx,andleft ovarian hemorrhagic cyst. (ESHRE U2aC0 V2/3) The patient wasadvisedtoundergoseptoplasty.Within3monthsoftheprocedure,thepatient started to have regular menstruation.

Case 6

A 20-year-old female with complaints of primary infertility for 2yearson USG screening showed the possibility of two separate endometrialcavities – bicornuate/septate uterus. Two separate cervixes were alsoseen. MRI scanning revealed two separate uteri with two cervices andtwo vaginas (ESHRE U3bC2V1). The patient was advised to undergometroplastywithvaginoplastyandcervicoplasty.Sheconceived within8 months of the surgery procedure.

Case 7

17-year-old female with a history of primary amenorrhea with nohistoryofcyclicalpainabdomenonUSGscreeningshowedauterus-likestructure which is smaller in size than the cervix and a cystic lesion inthe left ovary. MRI revealed unicornuate rudimentary uterus with normalcervixandvaginawasmade(ESHREU4aC0V0)withanendometriomaintheleftovary.Shewasadvisedtoundergometroplasty.Post-procedurewithin 8 months patient had an irregular menstrual cycle.

Case 8

A 6-year-old female with a history of urinary incontinence withdribbling, on USG screening, showed two separate endometrialcavities with non-visualization of cervix. MRI revealed bicorporealbicollisuteruswithpartiallyobstructinglongitudinalvaginalseptum. Urography showed ectopic insertion of the right ureter withhydrocolpos in the left vagina (ESHRE U3bC2V2). She was advised toundergometroplastywithseptoplastywithureteric reimplantation (not ureteroplasty).Sheisyettoundergosurgeryasarepeatedhistoryofurinary tractinfectionsmakesthe patient unfit for any surgery.

endometrial lining. MRI revealed a left unicornuate uterus with non-communicatingrightrudimentaryhorn.(ESHREU4aC3V0).Thepatientwasadvisedtoundergometroplasty.Sheisyettoundergosurgerydueto financial constraints.

Case 9

A 30-year-old female with a history of primary infertility for 5 years,onUSGscreeningshowedauterus-likestructurewithanill-defined

Case 10
Ultrasound scan was not done i/v/o. A 17-Year-old female presentedforMRIimagingforpost-traumaticworkupoftheurethralandvaginalstatus along with secondary amenorrhea for since trauma (2 years).USGwasnotdoneduetoalteredanatomyfollowingahistoryoftraumawith a history of ureteroplasty (kindly write the accurate surgery namew). Congenital anomaly of the uterus waspicked upon MRIscan. Aseptum wasseen separatingthe twocervicalcanals completely along with the septation of the proximal vaginalcanals into two halves. A portion of the septa was also seen to extendintotheuterinecavity.However,noobviousvisualizationoftheuterinesepta was seen. The inter-cornual distance was 3.2 cm and no obviousfundal indentation was seen. She was advised to undergo septoplasty.She is yet to undergo surgery due to financial constraints.

Case 11
A5-year-oldfemalewithahistoryofS1hemivertebraewasaskedfor a screening ultrasound to rule out associated anomalies. USGrevealednon-visualizationofuteruswithnormalbilateralovaries.MRIconfirmed uterine and cervical aplasia (ESHRE U5bC4). Urographicsequence revealed ectopic insertion of left ureter into urethra. Thediagnosis of Mayer-Rokitansky-Küster-Hauser (MRKH) Syndromewas confirmed. The patient was advised to undergo vaginoplasty andureteric reimplantation (not ureteroplasty).Sheisyettoundergosurgeryduetofinancialconstraints.

Case 12
A 17-year-old female with a history of primary amenorrhea on USGshowed a normal cervix with absent uterus. MRI revealed uterinehypoplasia with a normal cervix (ESHRE U5aC0V0). The patient wasadvised to undergo metroplasty. She is yet to undergo surgery due tounderlying dilated cardiomyopathy.

Case 13
A 26-year-old female came with complaints of primary amenorrheaandprimaryinfertility.ScreeningUSGrevealedabsenceofuteruswithnormalbilateralovaries.MRIconfirmedthediagnosisofaplastic uteruswith left rudimentary horn with cervical aplasia (ESHRE U5aC4V0)(Fig. 2). A diagnosis of MRKH Syndrome was made. The patient wasadvisedforassistedreproductivetechnology(ART)oradoption.Asshecould not afford ART, is waiting for adoption.

Case 14
A 36-year-old female with a history irregular menstruation witholigomenorrhea and repeated miscarriages, on USG revealed twoseparate uterine cavities and two cervices with hematometra andhematocolpos. Hysteroscopy was done to relieve hematometra andhematocolpos.

MRI confirmed diagnosis of bicorporeal uterus with double cervix andnormal vagina with residual hematometra (ESHRE U3C2V0) (Fig. 3).Patientwasadvisedformetroplastyandcervicoplasty;however,sheis yet to undergo the procedures due to financial constraints.

Case 15
A 17-year-old female presented with primary amenorrhea. ScreeningUSG revealed the presence of a rudimentary uterus-like structure with ill-defined endometrial lining with normal bilateral ovaries. MRI confirmeduterine hypoplasia with only two rudimentary horns joined through aseptum in the midline s/o complex uterine anomaly. A blind-ending distalvaginal pouch was seen (ESHRE U6C4V4). The patient was advised formetroplasty,cervicoplasty,andvaginoplasty.Thefirsttrialsurgeryfaileddduetoinfection.Atpresent,sheiswaitingforasecondtrialofsurgery.

Case 16
A 30-year-old female presented with a history of recurrent abortions.ScreeningUSGrevealedthepresenceoftwouterinecavitieswith

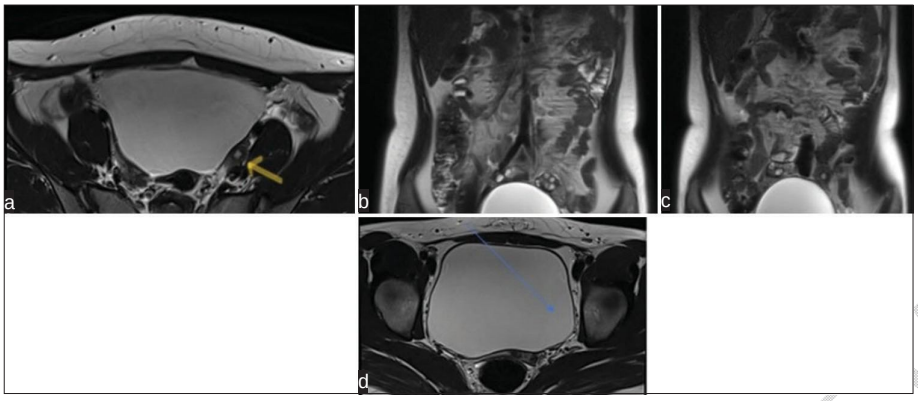

Fig.2:(a)AxialT2-weightedimageshowingrudimentaryleftuterinehorn(arrow)withuterineaplasia.(bandc)CoronalT2-weightedimagesshowingnormalbilateralovarieswith leftrudimentary uterine.(d)AxialT2-weightedimage showingcervicalaplasia; normalvagina was seen. ESHRE-U5aC4V0

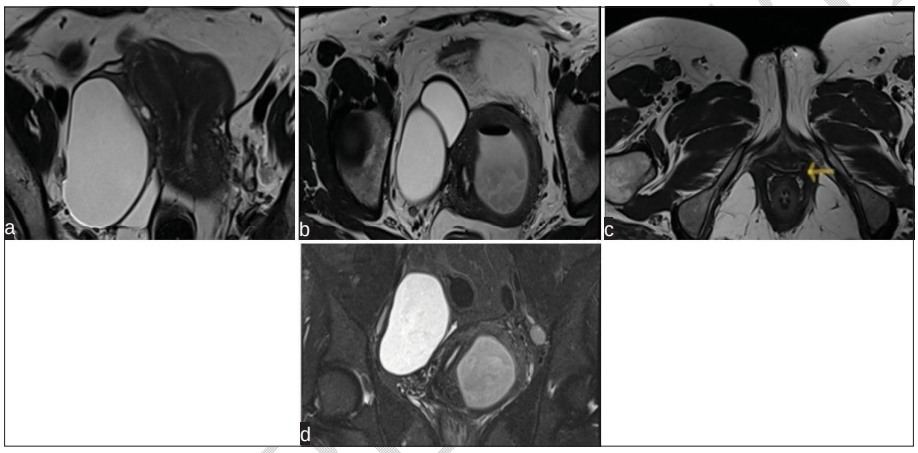

Fig.3:(a)AxialT2-weightedimageshowstwoseparateuterinecavitieswithobtuseanglebetweenuterinehorns.(b)AxialT2-weightedimage shows two separate cervical cavities with hematotrachelos in the left cervical cavity. Note is made of right endometrioma. (c) Asinglevaginalcanalisnotedwithminimalhematocolpos(arrow).(d)CoronalT2-weightedimageshowingtwoseparatecervicalcavities with bilateral endometriomas ESHRE-U3C2V0

normal bilateral ovaries with possibility of septate and bicornuateuterus. MRI revealed a partial septate uterus with the normal cervix,vagina, and bilateral ovaries (ESHRE U2aC0V0). The patient wasadvised for septoplasty.

Case 17

A 27-year-old female presented with a history of primary infertilityand dysmenorrhea. USG revealed the presence of two uterine cavitieswith normal ovaries. Cervix was not visualized clearly. MRI revealed apartialseptateuteruswithapartialseptatecervixandbilateralovaries(ESHRE U2bC1V0). The patient was advised septoplasty. She hasrecently undergone successful surgery and is planning for pregnancy.

The clinical features of all the cases are depicted in Table 1.

DISCUSSION

In this case series, we have prospectively investigated 17 cases withsuspicion of MDA with MR imaging. MRI scan has correctly delineatedthe wide array of developmental defects of MDA in these cases alongwith accurate identification of any other structural defects in all thepatients.Itistobenotedthatmanyofthedevelopmentaldefectsof MDAcanbepickedupbyUSGand,MRIremainstobetheimagingtechniqueof choice as it is the most accurate non-invasive imaging techniqueavailable till date. MRI unlike USG and HSG can correctly classify theuterovaginal developmental defects of MDA, besides picking up otherdevelopmentaldefectsinsurroundingstructureslikethe ureteror

urethra; also, it gives clear idea about the external contour of uterinefundus,shapeoftheuterinecavity,andcanalsodelineatethechara cterof the septa, if any [6-8].

Although MDA are uncommon, 7% of the general female populationand up to 25% of the females presenting with infertility or frequentmiscarriages, but it can be treated to some extent [4]. Therefore, todecide the treatment course and the chance of successful conception,accurateclassificationofMDAisessential.MRimaginghaspro vento be an essential tool for accurate classification of MDA. The mostcommon classification system used worldwide was developed by theAmerican Society of Reproductive Medicine. As per this classification,the developmental anomalies in MDA can be hypoplasia or agenesis(class I: vaginal, cervical, fundal, tubal, and combined), unicornuate(class II: communicating, non-communicating, no cavity and no horn),didelphus(classIII),bicornuate(classIV:completeandpartial),sep tate(class V), arcuate (class VI), and DES-related (class VII) [1,8-10].

Class I cases show typical MRI findings like the presence of fibrousbands joining Müllerian remnants of both sides and meeting at thetriangular-shapedsofttissue(continuouswiththevagina)andlocatedinthemiddleju stabovethebladder.ClassIIcasestypicallyshowonMRIscans the presence of banana shaped uterine horn with one fallopiantube and deviated to on side. On T2-weighted images, non-functioningrudimentaryhornshowshomogenouslowsignalintensity;o nthe

Table1:Descriptionofthe cases

S. No.	Age(years)	Chiefcomplaint	Ultrasonographyfindings	Magneticresonanceimagingfindings	Otherinvestigations	Advice
1.	17	Primaryamenorrheawith no history of cyclical painabdomen	Absence of uterus withnormalbilateralovaries	Aplasticuteruswithpartialvaginal agenesis andcomplete cervical agenesis(ESHRE U5a C4 V4)		Toundergovaginoplasty
2.	24	Repeated history ofspontaneousabortionswith normal menstrual history	Twoseparateendometrialcavitieswithpossibilityof Bicornuate/ septateuterus	Bicornuate uterus withcommoncervicalandvaginalcanal was made (ESHRE U3bC0V0)		Advisedtoundergoseptoplasty
3.	23	History of primaryinfertilityfor2years	Twoseparateendometrialcavitieswithpossibilityof Bicornuate/septateuteruswith septatevagina	Completeseptateuteruswithpartial septate cervix withnon-obstructivelongitudinalvaginal septum was made (ESHREU2bC1V1)		Advisedtoundergoseptoplasty;post-procedurepatientconceived within2 months
4.	29	Historyofspontaneous miscarriages with 3abortions	Twoseparateendometrialcavitieswith possibility ofBicornuate/septate uteruswithtwoseparatecervix and vagina	Completeseptateuteruswithtwocervicesandtwovaginaswasmade(ESHREU2bC2V1)		Advisedtoundergoseptoplasty,cervicoplasty,andvaginoplasty. Post-procedurepatientconceivedwithin6 months
5.	22	History of primaryamenorrheawithhistoryofcyclical pain abdomen	Showedpossibilityoftwoseparateendometrialcaviticesbicornuate/septateuterus. Hematometraandleftovarian hemorrhagic cyst	Partial septate uteruswithnormalcervixand obstructingobliquevaginalseptum;hematometra,hematosalpinx, and leftovarian hemorrhagic cyst. (ESHREU2aC0 V2/3)		Advised to undergoseptoplasty.Patientstartedtohavenormalmenstrualcyclewithin3monthsoftheprocedure.
6.	20	Complaintsofprimaryinfertility for 2 years	Possibility of twoseparateendometrialcavities– bicornuate/septate uterus. Twoseparate cervix were also seen.	Twoseparateuteruswithtwocervicesandtwovaginaswasmade (ESHREU3bC2V1)		Advised to undergometroplasty withvaginoplastyand cervicoplasty.Patient conceived within 8 monthsofprocedure
7.	17	History of primaryamenorrheawithnohistoryof cyclical pain abdomen	Showed a uterus-likestructure which issmaller in size thanthecervixanda cystic lesionintheleftovary.	Unicornuaterudimentaryuteruswithnormalcervixandvagina was made (ESHREU4aC0V0)with endometriomaintheleftovary		Advisedtoundergo metroplasty. Patienthadirregular menstrual cycle 8 monthspost-procedure
8.	6	History of urinaryincontinencewithdribbling	Twoseparateendometrialcavitieswithnon-visualizationofcervix.	Bicorporeal bicollis uteruswith partially obstructinglongitudinalvaginalseptumwasmade	Urographyshowedectopicinsertion of the rightureter withhydrocolposin the left vagina(ESHREU 3bC2V2)	Advisedtoundergo metroplastywith septoplastywithureteroplasty. Patientisstillwaitingforsurgeryasrepeatedepisodesofurinarytractinfectionsmakesthepatientunfitforanysurgery
9.	30	History of primaryinfertilityfor 5years.	Showedauteruslikestructurewithanill-definedendometriallining	Leftunicornuateuteruswithnon-communicatingrightrudimentaryhorn(ESHREU4aC3V0)		Advised to undergometroplasty Patientisstillwaitingfor the surgeryduetofinancial constraints

10.	17	History of secondaryamenorrheapost-trauma(2 years)	Not Done due toalteredanatomyfollowingtraumawithureteroplasty	Congenital anomaly of theuteruswaspickedup.Aseptawas seen separating the twocervicalcanalscompletely along with septation of theproximal vaginal canals intotwo halves. A portion of theseptawas also seento extendintotheuterinecavity.However,noobviousvisualizationoftheuterine septa was seen. Theinter-cornualdistancewas 3.2cmandnoobviousfundalindentationwasseen.	Initially planned forvaginoplasty;followingMRI findings, wasadvised to undergoseptoplasty.Patient is still waiting for thesurgeryduetofinancialconstraints

(*Contd*...)

Table1:(*Continued*)

S. No.	Age(years)	Chiefcomplaint	Ultrasonography findings	Magneticresonanceimaging findings	Otherinvestigations	Advice
11.	5	HistoryofS1hemivertebrae was asked for a screeningultrasound to rule outassociatedanomalies	Nonvisualizationof uterus with normalbilateralovaries	Uterineandcervicalaplasia(ESHREU5bC4) A diagnosis of Mayer-Rokitansky-Küster-HauserSyndrome was made	Anurographic sequencewas alsotakenand ectopicinsertionof leftureterinto urethrawas seen	Advisedtoundergo vaginoplastyandureteroplasty. Patientisstillwaitingfor thesurgeryduetofinancialconstraints
12.	17	Historyofprimary amenorrhea	Showednormalcervix with absent uterus	Uterinehypoplasiawithnormalcervixwasmade(ESHREU5aC0V0)		Advisedtoundergo metroplasty. Patientisstillwaitingfor the surgery duetounderlyingdilated cardiomyopathy. WasadvisedforARToradoption.
13.	26	Complaints of primaryamenorrheaandprimaryinfertility.	Showedabsenceofuteruswithnormalbilateralovaries.	Aplasticuteruswithleftrudimentary horn withcervicalaplasia (ESHREU5aC4V0) A diagnosis of Mayer-Rokitansky-Küster-HauserSyndrome was made		Patient cannot affordARTandiswaitingforadoption.
14.	36	History of repeatedmiscarriagesandirregularmenstrual history witholigomenorrhea	Twoseparateuterinecavitiesandtwo cervices withhematometraandhematocolpos	Bicorporeal uterus withdoublecervixandnormalvagina with residualhematometra was made.(ESHREU3C2V0)	Hysteroscopy wasdone torelievehematometraandhematocolpos	Advisedformetroplastyandcervicoplasty. Patientcannotaffordthe surgery and iscurrently trying to gather funds
15.	17	Presentedwithprimary amenorrhea	Rudimentaryuteruslike structure with ill-definedendometriallining with normalbilateralovaries	Uterine hypoplasia withonlytworudimentaryhornsjoined through a septum inthemidlines/ocomplexuterineanomaly Ablindendingdistalvaginalpouch was seen (ESHREU6C4V4)		Advisedformetroplasty,cervicoplastyandvaginoplastyPatientunderwentone trial of failed surgeryduetoinfectivecomplications and iswaiting for a second trialof surgery
16.	30	Historyofrecurrent abortions	Presenceoftwouterinecavities with normalbilateral ovaries withpossibility of septate andbicornuateuterus	Partialseptateuteruswithnormalcervix,vagina,andbilateralovarieswasmade(ESHREU2aC0V0)		Advisedforseptoplasty Patient is waiting forsurgery
17.	27	HistoryofprimaryinfertilityanddysmenorrhEa	Presenceoftwouterinecavities with normalovaries. Cervix was notvisualizedclearly.	Partialseptateuteruswithpartial septate cervix andbilateral ovaries (ESHREU2bC1V0)		Advisedforseptoplasty Patient has recentlyundergonesuccessful surgeryandisplanningforpregnancy.

other hand, functional rudimentary horn after puberty shows highsignalintensityonbothT1andT2images,suggestiveofhematometra.

Class III cases, on MRI, show widely spaced two divergent horns withpreservedendometrium;ontheoutersidedeepmidlinefundalcleftis usually seen complete with two separate cervixes. There is alsoduplicationofthevaginapickedupMRI,withthehemovaginalseptumblockingonofthehornsofuterususuallywithhighsignalintensityonT1images(duetopresenceofblood).InClassIVpatientscleftof>1cmindepthonMRIisidentifiedontheouteraspectofthefunduswitha gap of more than 4 cm between the cornu. In Class V cases, an MRIscan helps in the delineation of the character of the septum, as basedon the nature of the septum, surgical approach is chosen. A fibrousseptum with low signal intensity at T2-weighted images requireshysteroscopicresection,whereasamuscularseptumwithintermediate

signal intensity at T2-weighted images will require transabdominalapproach.ClassVIcasesonMRIscanshowauterusofnormalsizewithnormalexternalappearance,exceptforsmooth-appearingsofttissueatthe fundus encroaching within the uterine cavity.

MRIscanforClassVIIcasescanpickupdifferenttypesofimages,mostcommonly being T-shaped uterus. Other than the above-mentionedclassification, another classification is there, the European classificationof MDA. As per this classification, following main classes are there,normal uterus (U0); dysmorphic uterus (U1: t shaped, infantilis, andothers); U2, septate uterus (U2; partial and complete); bicorporealuterus (U3; partial, complete, and bicorporeal septate); hemi-uterus(U4; with rudimentary cavity, and without rudimentary cavity); aplasticuterus(U5;withrudimentarycavity,andwithoutrudimentarycavity);for still unclassified cases (U6) [1,8-10].

Depending on the classes, the treatment modalities are decided. Thus,accurate classification with MRI is essential to ensure the successfulmanagement of individual cases. However, it has to be remembered thatthe classification system is just a framework, not all the cases will fitintoit.Themajorityofthepatientsinourcaseseries(n=15)presentedwith complaints of amenorrhea (primary, most commonly) alongwith infertility; only two cases (n=2), two girls of 6 years and 5 years,respectively,presentedwithurinaryincontinencewithdribblingofuri neandS1hemivertebrae,respectively.Sevenpatientswithseptateuterus(casenos.2,3,4,5,10,16,and17)wereadvisedseptoplastyfollowingthefinal diagnosisandcategorizationofMDAwithMRimaging.Ofthesepatients, two patients (case nos. 3 and 4) have successfully conceived afterprocedure,onepatienthasstartedmenstruating(caseno.5),threepatients(casenos.2,10,and16)areyettoundergosurgery,andonepatient(caseno.17) hasundergonesurgerysuccessfullyandplanningforpregnancy.

Another seven patients were advised metroplasty (case nos. 6, 7, 8, 9,12, 14, and 15), along with vaginoplasty (in n=2 patients case nos.6,and 15) and cervicoplasty (n=3, case nos. 6, 14, and 15). Two patientswere diagnosed as with MRKH Syndrome; the 26-years-old patient(case no13) (aplastic uterus, left rudimentary horn, and normal bilateralovaries) was advised for ART or adoption and the second patient aged5 years (caseno. 11) was advised vaginoplasty and urethroplasty (as leftureterwasinsertedinurethra).Onepatientwas(caseno.1)wasadvisedon lyvaginoplastyasshehadaplasticuteruswithpartialvaginalagenesisand complete cervical agenesis. Like our cases, Guo X and her colleagueshavereportedacaseoftwinpregnancyinawomanwithseptateu terusfollowing metroplasty [11]. Again, in another case like ours, SelvarajandSelvarajalsoreportedcasesofsuccessfultermpregnancyinse venwomenwithsecondaryinfertilityandsixcasesofsuccessfulpregnancyi n primary infertile women [12]. In another systematic review byCarrera*etal*.,theimportanceofmetroplastyhasbeenoutlinedtoreducemi scarriage in partial and complete uterine septum [13].

Thus, all these findings suggest that with appropriate managementmany of the patients of MDA can conceive; however, it should bestressed that for choosing timely surgical intervention accurateclassification of the developmental defect is essential and for that MRIscanisessential.Moreover,correctclassificationwithMRIscancanals oavoid unnecessary surgical interventions and patient can be advisedaccordingly for adoption or ART.

CONCLUSION

MDA comprises of wide variety of developmental anomalies withdifferent presenting features. Although MDA can be initially detectedwith HSG or USG; these two investigations are incapable of accuratelycategorizeMDAanddelineateotherstructuralanomalies,ifany. MRIisthe imaging technique of choice for MDA, as it can accurately classifydevelopmental anomalies and therefore guide the clinician to choosethe best treatment modality for the patient. Female infertility can beattributed to MDA, and in many cases of MDA appropriate surgery canlead to successful conception. Furthermore, in some cases, surgerycannot lead to conception. Thus, correct classification of individualcases with MRI is essential for not only successful conception throughappropriate surgery but also for avoidance of unnecessary surgicalintervention.

PATIENTCONSENTSTATEMENT

Nopersonalinformationhasbeenshared.However,consentwastakenverb allyforincludingimagesandprofessionalinformationinthepaper.

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