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MR Evaluation of Various Uterine Anomalies

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Abstract: ***1.5 Tesla MRI, T1w axial, T2w axial, T1 sagittal , T2 sagittal, STIR axial, T1w coronal , T2w coronal, T1fat sat & contrast.***

Keywords: MR Coils, Uterus ,Septate, Bicorunate, Unicornuate , Didelphys , cervical & vaginal aplasia , MRKH syndrome

1. Introduction

Magnetic resonance imaging is a useful non invasive tool for demonstrating pelvic anatomy and pelvic abnormalities, including anomalies of the female genital system. An MRI can be more effective owing to its multiplanar capability and the best soft tissue contrast compared to any other imaging modalities and without the use of ionizing radiation. MR imaging has proved to be a helpful tool in the management of uterovaginal anomalies, particularly complex lesions.

This is an interesting study with patients presenting with various congenital anomalies of the uterus. A uterine malformation is a type of female genital malformation resulting from an abnormal development of the Mullerian ducts during embryogenesis. This study included patients in the age of twelve at one end and a premenopausal patient in the other end.

2. Materials and Methods

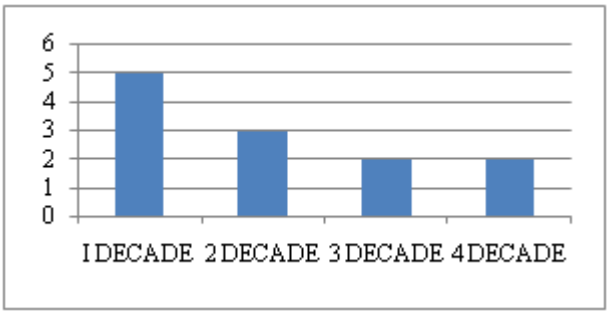
MRI plays a major role in the evaluation of uterine anomalies next to USG. All the patients who are referred from the OG department of our hospital are taken in this study and are subjected to USG as well as MR evaluation. The study includes totally fourteen patients in four months duration from January to April of this year. Out of this nine were in their teens and other five in the second to fourth decade. Among these patients two of them presented with associated pregnancy.

3. Case Study

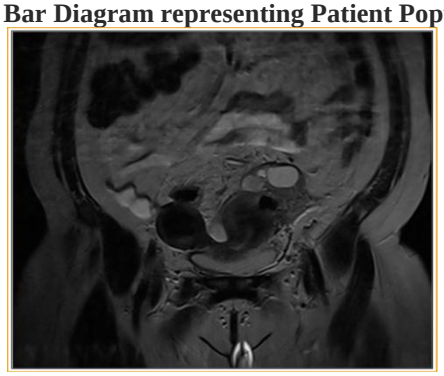
It is a prospective study. Age group of patients in this study ranges from twelve to forty seven years. The total population in this study is fourteen. The youngest in this study is twelve year old girl and oldest is 47 years female. Among these patients nine in their teen age group three in the second decade and one in third and other oldest in fourth decade. Of all the nine in their teens, seven patients presented with periodical lower abdominal pain and primary amenorrhoea. Other two presented for primary amenorrhoea.

Four patients presented with hematometrocolpos due to imperforate hymen, one patient presented with unicornuate uterus with non communicating rudimentary horn and hematosalphinx . One unicornuate uterus with cervical and vaginal aplasia. One patient with infantile hypo plastic uterus and streak ovaries, one patient with MRKH type II. (Associated crossed fused ectopia).

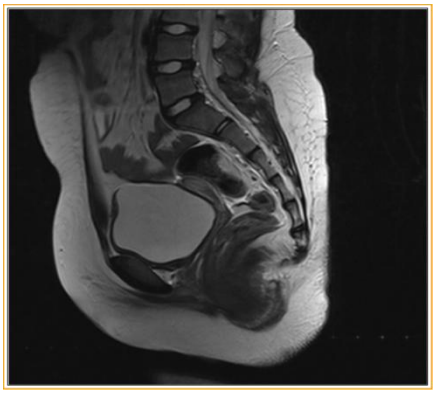
Among the three patients in the second decade one with cervical and vaginal aplasia , second patient bicornuate uterus and a vaginal cyst, third patient septate uterus with associated 7 weeks pregnancy in one side of uterus. The patient in the third decade is a G2P1L1A1 with uterus didelphys, and pregnancy in the right side uterus and around 11 weeks fetus.The patient in the fourth decade is premenopausal patient presented with abnormal vaginal bleeding. P2L2 , undergone sterilisation and is a proven case of uterus didelphys with associated hydrosalphinx.



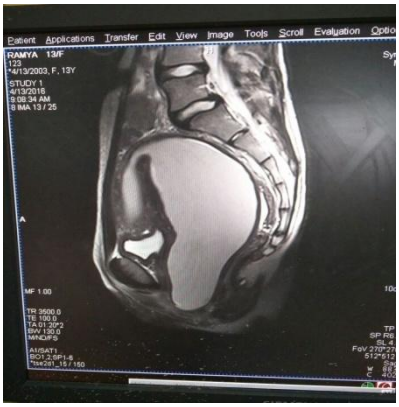
Bar Diagram representing Patient Population In Decades



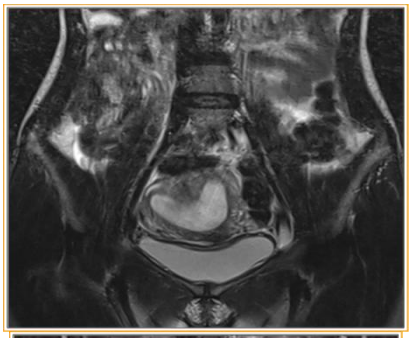
T2W CORONAL SEQUENCE ,UTERUS DIDELPHYS & FIBROID IN RIGHT SIDE UTERUS

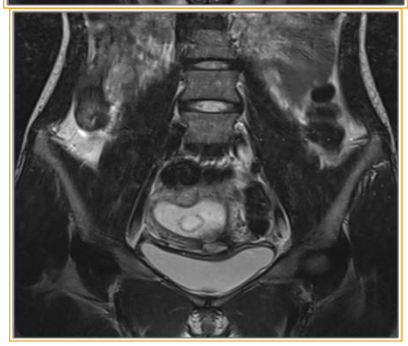


SAG T2W MRI SHOWING INFANTILE HYPOPLASTIC UTERUS

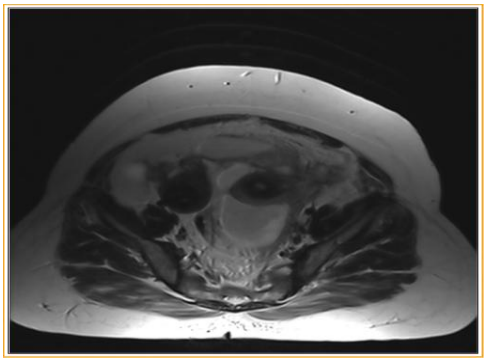


Sag T2W MRI with Hydrometrocolpos& Hydrosalphinx

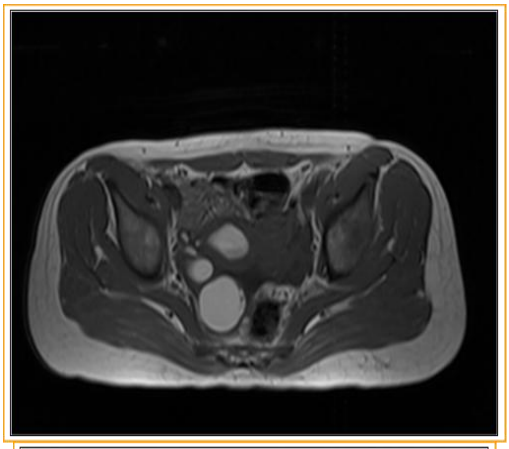


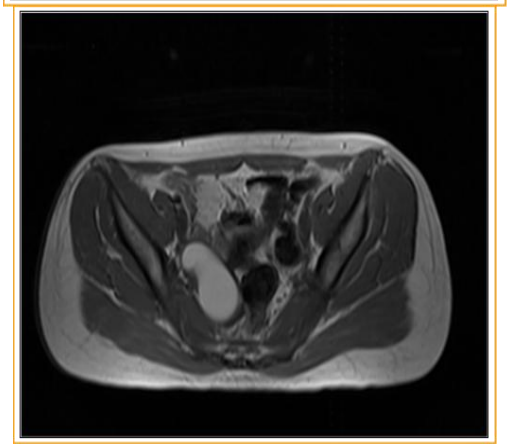


T2W Coronal MRI with Sepate Uterus & GSAC In Right

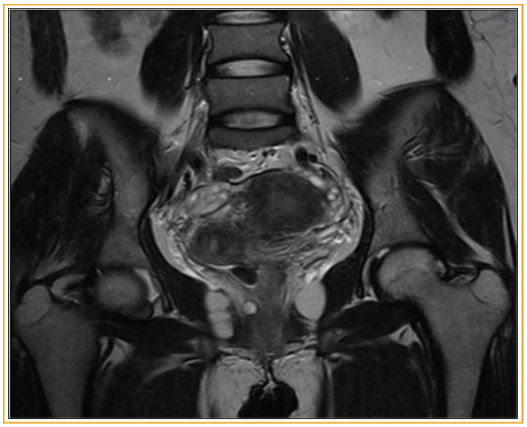


Axial T2W MRI - Uterus Didelphys & Left Hydrosalphinx

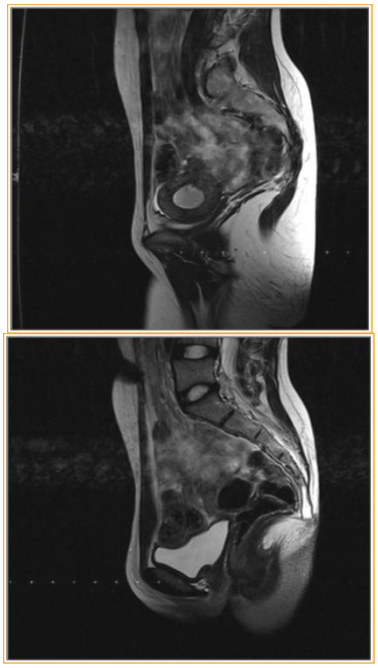




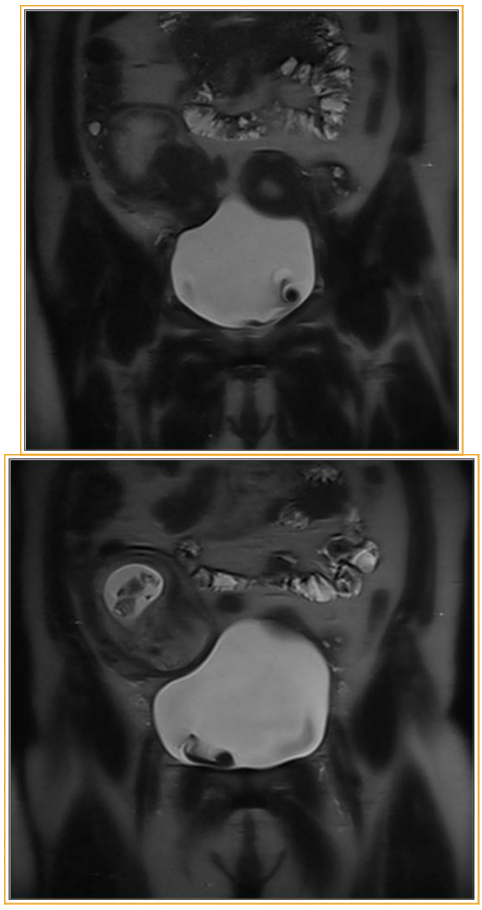
Axial T1W MRI – Unicornuate Uterus & Right Hematosalphinx



T2W Coronal MRI with Bicornuate Uterus ,Vaginal Cyst



T2W SAG MRI with Unicornuate Uterus With Hematometra, Cervical & Vaginal Aplasia



T2W Haste Coronal with Uterus Didelphys & 11 Weeks Fetus In Right Side Uterus

MR Imaging Findings in Utero Vaginal Anomalies.

Dysgenesis of Mullerian Ducts: Hypoplasia, Agenesis.

A hypoplastic uterus is diagnosed on the basis of its small size and reduced intercornual distance (<2 cm). The zonal anatomy may be poorly differentiated in T2-weighted images of infantile uteri. In agenesis of the müllerian duct derivatives (Mayer-Rokitansky-Kuster-Hauser syndrome), no identifiable uterine tissue or the upper two-thirds of the vagina could be seen.

Vertical Fusion Defect

Transverse vaginal septum: A transverse vaginal septum could be in a high, middle, or low position. It is more common in the upper vagina.

Obstructed hymen: Obstructed hymen is also considered a vertical fusion defect. Sagittal MR images document the exact site of vaginal obstruction.

Lateral fusion defects

A. Symmetric nonobstructive form of lateral fusion defects

Unicornuate uterus: A unicornuate uterus is banana-shaped and slender, without the usual rounded fundal contour, and is usually laterally deviated. The corpus uterus is generally smaller, if present, a solid rudimentary horn can be observed as a soft-tissue mass with signal intensity similar to that of myometrium.

Cervical agenesis: No identifiable cervix in MR images. Hematometria may be seen if there is functioning endometrium in the uterine body.

Septate Uterus: The outer fundal contour is convex or flat or has a slight indentation less than 1 cm deep. The intercornual distance is within the normal range. The intercornual angle measures less than 60°. These findings are best seen in oblique long-axis images. The uterine septum may be composed of muscle or fibrous tissue. A muscular septum has intermediate signal intensity with all pulse sequences, isointense to myometrium. A fibrous septum usually has a lower intensity with all sequences. Mixed muscular and fibrous septa have also been described. If the septum reaches the internal os, it is complete if it terminates above the internal os, it is a partial septum.

Bicornuate uterus: Two uterine bodies and a single cervix are present in bicornuate uterus. The fundal cleft is greater than 1 cm in depth. The cleft is best visualized on oblique long-axis images of the uterus. The intercornual distance is increased (>4 cm) in bicornuate uteri. The tissue separating the two horns usually demonstrates signal intensity identical to that of myometrium with all pulse sequences.

Bicornuate bicollis is a term that describes a bicornuate uterus with double cervices. It can be distinguished from didelphic uterus because some degree of fusion has occurred between the lower uterine segments. Arcuate uterus with a convex or flat external contour and a mild impression on the endometrial cavity is considered the mildest form of bicornuate uterus.

Didelphic uterus*:* Two uterine bodies and two cervices are present in didelphic uterus. The uterine horns are widely splayed with a deep fundal cleft, and the intercornual angle

is more than 60°. Vaginal septa are most commonly associated with this type of uterine anomaly.

B. Asymmetric obstructive form of lateral fusion defects
Unicornuate uterus with a noncommunicating rudimentary horn. An obstructed rudimentary horn with functioning endometrium may be distended by blood or blood products. Retrograde menstruation into the fallopian tube may lead to associated hematosalpinx. Unilateral obstruction of a cavity of a double uterus. This is a unique syndrome consisting of a didelphic obstructed hemivagina and ipsilateral renal agenesis.

4. Conclusion

MR plays a major role in evaluating the uterine anomalies especially the complex uterovaginal anomalies. More common presentation is not attaining menarche and periodic abdominal pain without menstruation. Infertility is the common presentation in people in the reproductive age group. But in this small study of ten patients three has conceived one in the early first trimester and the other in the early second trimester and oldest patient in this study was in the perimenopausal age and had two live children. So uterine anomaly is not always an inhibiting factor for begetting children and medical miracle can happen any time.

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