Concordance of Magnetic Resonance Imaging with final diagnosis in Müllerian Duct Anomalies: A twelve year study between June 2004 and July 2016 from an Australian Quaternary Paediatric and Adolescent Gynaecology Centre

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Background

• Magnetic resonance imaging (MRI) is the diagnostic imaging gold standard for Müllerian Duct anomalies.\textsuperscript{1-2}
  • Avoids invasive procedures.
  • Ability to detect renal and skeletal abnormalities.

• Multiple studies have shown good concordance of MRI diagnosis with clinical diagnosis of Müllerian Duct anomalies ranging from 78.2\% to 100\%.\textsuperscript{3-8}

Declaration of interests – none.
Background

• MRI limitations
  • Definitive initial diagnosis.
  • Implications can be clinically significant, life-threatening, potentially fatal.\textsuperscript{9-10}

• Two case series found MRI has limitations in characterising cervical abnormalities.\textsuperscript{9-10}

• A further study has reported a patient death related to inaccurate initial MRI diagnosis of cervical abnormality.\textsuperscript{11}
Objectives

• Define concordance of MRI diagnosis with final diagnosis in patients with Müllerian Duct anomalies.

• Understand and highlight limitations of MRI.

• Improve diagnosis and management.
Methods

• 51 MRIs of patients with suspected Müllerian Duct anomalies between June 2004 and July 2016 reviewed retrospectively.

• Initial MRI diagnosis was compared to final diagnosis based on clinical, surgical and histological findings.

• Concordance = anatomical features on MRI consistent with clinical, surgical and histological findings, otherwise considered discordant.

• Concordance was reviewed in detail for uterine, cervical and vaginal structures separately.

• All MRIs were reviewed with a radiologist experienced in reviewing Müllerian Duct anomalies in the paediatric and adolescent population.

<table>
<thead>
<tr>
<th>Anomaly</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class II-VI</td>
<td>27</td>
</tr>
<tr>
<td>Class I (MRKH)</td>
<td>15</td>
</tr>
<tr>
<td>Complete vaginal atresia</td>
<td>2</td>
</tr>
<tr>
<td>High vaginal septum</td>
<td>4</td>
</tr>
<tr>
<td>Vaginal stricture post reconstruction for congenital abnormality</td>
<td>1</td>
</tr>
<tr>
<td>Lower vaginal anomaly</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>51</strong></td>
</tr>
</tbody>
</table>
## Results

Concordance of MRI diagnosis with final diagnosis in Müllerian Duct Anomalies

<table>
<thead>
<tr>
<th>Structure/s</th>
<th>Concordance</th>
</tr>
</thead>
<tbody>
<tr>
<td>All structures</td>
<td>35/51 (69%)</td>
</tr>
<tr>
<td>Uterine</td>
<td>48/51 (94%)</td>
</tr>
<tr>
<td>Cervical</td>
<td>45/51 (88%)</td>
</tr>
<tr>
<td>Vaginal</td>
<td>40/51 (78%)</td>
</tr>
</tbody>
</table>

- 16 pts with discordance
- 12 pts single structure discordance
- 4 pts dual structure discordance

All structures concordance - MRI diagnosis was in complete agreement with final diagnosis for uterine, cervical and vaginal structures.
Results

Total Discordance (20)
12 single, 4 dual

Uterine (3/51)
- 2x Wrong Class reported
- 1x Non-communicating uterine horn not reported

Cervical (6/51)
- 5x Partial cervical agenesis not reported
- 1x Incorrect location of cervix reported

Vaginal (11/51)
- 7x Vaginal septa not reported
- 4x Vaginal septa reported but not present
Cervical Discordance = 6

5/6 cases – partial cervical agenesis

3/5 triad of uterine didelphys, obstructed hemivagina and ipsilateral renal anomaly + partial cervical agenesis

Ectocervix absent
Endocervix present

2/5 had complete vaginal atresia + partial cervical agenesis
Partial Cervical Agenesis

• Complicated by:
  • Pain
  • Obstruction
  • Re-accumulation of blood products
  • Severe septic shock
  • Multi-organ failure
  • Extracorporeal membrane oxygenation
• All required definitive surgical management.
• Emergency surgery was required in 3/5 cases.
Conclusions

• MRI concordance for Müllerian Duct anomalies at our institution:
  • 69% All Structures
  • 94% Uterine structures
  • 88% Cervical structures
  • 78% Vaginal structures

• Discordance mainly related to partial cervical agenesis and vaginal septa.

• Recognition of MRI limitations and consequent timely definitive surgical intervention, if there are clinical disparities, is crucial to preventing life-threatening morbidity and potential mortality.
References


2. Troiano RN. Magnetic resonance imaging of mullerian duct anomalies of the uterus. Topics in magnetic resonance imaging : TMRI. 2003; 14: 269-79.


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American Fertility Society Classification

Congenital anomalies of the female genital tract

I Hypoplasia/agenesis
   a. Vaginal
   b. Cervical
   c. Fundal
   d. Tubal
   e. Combined

II Didelphys
   a. Complete
   b. Partial

III Unicorne
   a. Communicating
   b. Non-communicating
   c. No cavity
   d. No horn

IV Bicornuate
   a. Complete
   b. Partial

V Septate
   a. Complete
   b. Partial

VI Arcuate

VII DES drug-related