A New Classification for Cloacal Malformation

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Paediatric Institute: National Quaternary referral centre

Paediatric Surgical centre with active neonatal unit:
Annual Neonatal admission about 350 and 250 neonatal surgical operations

Population 31 million
Reservations:
Measurements subjective
Measurements referenced at what age?
Ignores the other more important components and relationships of cloaca
1) entry of the rectal fistula
2) Significant Mullerian anomalies
3) Associated significant hydrocolpos
4) Anatomy and presence of a normal bladder neck

Cloaca common channel lengths

<table>
<thead>
<tr>
<th>Common channel length</th>
<th>No. patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 cm or less</td>
<td>43</td>
</tr>
<tr>
<td>1-3 cm</td>
<td>182</td>
</tr>
<tr>
<td>3-5 cm</td>
<td>128</td>
</tr>
<tr>
<td>5 cm</td>
<td>47</td>
</tr>
<tr>
<td>Common channel not known</td>
<td>90</td>
</tr>
<tr>
<td>Total</td>
<td>490</td>
</tr>
</tbody>
</table>

Levitt MA, Peña A.
Cloacal Malformation: A New Classification

Methodology:
Retrospective review personal series cloacal malformation 1991 - 2015
(includes redo –Cloacal reconstructions -5 )
Correlate the anatomy with a new classification system

1) Entry of the rectal fistula
2) Presence of significant Mullerian anomalies
3) Presence of significant hydrocolpos
4) Presence of a normal bladder neck and proximal urethra (before its entry to the cloaca)
Cloacal Malformation: Types 1 & 2

**Type 1**
- Bladder neck
- Urethral length
- Vagina
- Rectal fistula
- Levator muscle and sphincter complex
- Cloacal common channel

**Type 2**
- Normal bladder neck with urethra of at least 2 cm
- Rectal fistula enters vagina
- Urogenital sinus = common channel
Cloacal Malformation:
Type 3: Significant Mullerian anomaly

Type 3a

- Vaginal duplication
- Rectal fistula in between the vaginal duplication
Cloacal Malformation:
Type 3: Significant Mullerian anomalies

Type 3b

Mullerian agenesis
Cloacal Malformation:
Type 3 Significant Mullerian anomalies

Type 3c: Significant hydrocolpos Septated vagina and Uterine didelphys

Sagittal representation

Gross hydrocolpos
Vaginal duplication

Rectal fistula in between the vaginal duplication
Cloacal Malformation:
Type 3 Significant Mullerian anomalies

Type 3c: Significant Hydrocolpos, Uterine didelphys septated vagina
Cloacal Malformation: Type 4: Absent Bladder neck & Urethra

No bladder neck
### Cloacal Malformation: Results according to new classification

<table>
<thead>
<tr>
<th>Cloacal type</th>
<th>Numbers</th>
<th>Percentage of total cloacal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4</td>
<td>7.8%</td>
</tr>
<tr>
<td>2</td>
<td>12</td>
<td>23.5%</td>
</tr>
<tr>
<td>3a</td>
<td>22</td>
<td>43.1%</td>
</tr>
<tr>
<td>3b</td>
<td>5</td>
<td>9.8%</td>
</tr>
<tr>
<td>3c</td>
<td>2</td>
<td>3.9%</td>
</tr>
<tr>
<td>4</td>
<td>6</td>
<td>11.7%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>51</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>
Cloacal reconstruction

Type 1:
Only needs Posterior sagittal anorectoplasty (PSARP) with skin cut back

Type 2:
Usually also only needs PSARP prone position and rotation cuff of distal fistula reconstruct the introitus
Cloaca: Type 3.
(Type 3c. Needs drainage of hydrocolpos till reconstruction later)

- Abdominal component to free enough colon length
- Genital reconstruction
  
  In situ cutback and reconstruction of posterior vagina wall
  Introitoplasty & labioplasty.
  Cuff distal rectal stump, vascularised or free graft
Discussion and Conclusions

All patients can be classified according to the proposed new classification.
Surgical reconstruction can be planned according to the type.
Probably easier to compare results within each type of cloacal malformation.
### Cloacal Malformation: Proposed new classification

<table>
<thead>
<tr>
<th>Type</th>
<th>Bladder neck &amp; prox. urethra</th>
<th>Mullerian abnormalities</th>
<th>Entry of rectal fistula</th>
<th>Sig. hydrocolpos with hydronephrosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Normal bladder neck &amp; Proximal urethra</td>
<td>None</td>
<td>Into the cloacal channel, low</td>
<td>Nil</td>
</tr>
<tr>
<td>2</td>
<td>Normal bladder neck &amp; Proximal urethra</td>
<td>None</td>
<td>Recto vaginal fistula which distal vagina</td>
<td>Nil</td>
</tr>
<tr>
<td>3a</td>
<td>Normal bladder neck &amp; Proximal urethra</td>
<td>(Uterine didelphys and septated vagina) ESHRE/ESGE type U3 V1</td>
<td>Between the septated hemi-vaginas into the cloaca</td>
<td>Nil</td>
</tr>
<tr>
<td>3b</td>
<td>Normal bladder neck &amp; Proximal urethra</td>
<td>Absent or dyplastic uterus) ESHRE/ESGE Type U5</td>
<td>Into the cloacal channel high</td>
<td>Nil</td>
</tr>
<tr>
<td>3c</td>
<td>Normal bladder neck &amp; Proximal urethra</td>
<td>(Uterine didelphys and septated vagina) ESHRE/ESGE Type U3 V2</td>
<td>Between the septated hemi-vaginas into the cloaca</td>
<td>Hydrocolpos with hydronephrosis</td>
</tr>
<tr>
<td>4</td>
<td>Absent Bladder neck &amp; absent proximal urethra</td>
<td>Variable, usually has significant Mullerian anomalies</td>
<td>Rectal fistula enters the common cloacal cavity or bladder</td>
<td>Variable</td>
</tr>
</tbody>
</table>

Thank You.