The diagnosis and management of Caesarean scar pregnancies

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Declaration of Interest

- Conflict of interest – None

Topics to cover

- Diagnosis
- Natural history
- Review of treatments reported in the literature
- Body of evidence from King’s & UCH cohort of scar pregnancies

Diagnosis: AEPU 2013 case

- 32 year old
- 2 x previous LSCS
- PV bleeding in early pregnancy
- 6/60 TVS – ‘sac at level of CS scar’
- No mention of placenta at 12/40 scan
- Anomaly scan 20/40 low lying placenta
- 22/40 collapsed at home

Diagnosis: cautionary tale

- Blue light to A&E – c/o severe backache & diarrhoea
- Shocked on arrival & PEA arrest 10 minutes later
- 18 mins CPR until output obtained
- Emergency laparotomy – ruptured uterus due to placenta percreta, hysterectomy & 8l blood loss
- Acute renal & hepatic failure, necrotising pancreatitis, ischaemic colitis, second laparotomy D2
- 15 days on ITU
- Intra-abdominal collections & pneumonia
- Inpatient for two months
English Literature

Diagnosis: scar implantation

Diagnosis: scar implantation

Diagnosis: scar implantation

Diagnosis: scar implantation
No absolute consensus on diagnostic criteria
- Empty uterine cavity
- Discontinuity of the anterior uterine wall on longitudinal section of the uterus
- Gestational sac located anteriorly at the level of the internal os covering the visible or presumed site of the previous lower uterine segment Caesarean section scar
- Demonstrable peritrophoblastic blood flow & degenerating trophoblast
- Disruption of endometrial / myometrial interface by trophoblast

Additional features:
- Placental lacunae
- Wedge shaped gestational sac
Case reports of the natural history of ongoing CSP prospectively diagnosed in the first trimester.

<table>
<thead>
<tr>
<th>Study</th>
<th>n</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abraham</td>
<td>7</td>
<td>71 CSIMJ, APH 35/40, emergency CS, haemorrhage, emergency hysterectomy</td>
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<tr>
<td>Ben Nagi</td>
<td>5</td>
<td>El CS at 37/40, haemorrhage, emergency hysterectomy</td>
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<tr>
<td>El-Matary</td>
<td>6</td>
<td>3 SROM 31/40, APH 36/40, emergency CS, haemorrhage, emergency hysterectomy, internal iliac ligation</td>
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<tr>
<td>Herman</td>
<td>7</td>
<td>2 acute abdominal 33/40, laparotomy, haemorrhage, hysterectomy, internal iliac ligation</td>
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<tr>
<td>Jurkovic</td>
<td>6</td>
<td>Haemorrhage 16/40, hysterectomy</td>
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<tr>
<td>Sinha</td>
<td>6</td>
<td>Elective LSCS 37/40, haemorrhage, emergency hysterectomy, abdominal packing ITU</td>
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<tr>
<td>Wong</td>
<td>6</td>
<td>37 weeks CS and hysterectomy</td>
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<tr>
<td>Timor-Trisch</td>
<td>9-12</td>
<td>3 second trimester ruptures, 1 second trimester haemorrhage and hysterectomy, 8 third trimester hysterectomies</td>
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n = 20
Natural History?

Case reports of the natural history of ongoing scar implantation prospectively diagnosed in the first trimester.

<table>
<thead>
<tr>
<th>Case</th>
<th>GA presentation</th>
<th>GA delivery</th>
<th>EBL (ml)</th>
<th>Urinary tract injury</th>
<th>Histology</th>
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<tbody>
<tr>
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<td>acrreta</td>
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<tr>
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<td>1400</td>
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<tr>
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<td>2500</td>
<td>bladder</td>
</tr>
<tr>
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<td>9+1</td>
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<td>3500</td>
<td>bladder</td>
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<tr>
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<td>13000</td>
<td>percreta</td>
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<tr>
<td>6</td>
<td>6+1</td>
<td>35</td>
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<td>1000</td>
<td>acrreta</td>
</tr>
<tr>
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<td>7+5</td>
<td>35</td>
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<td>1500</td>
<td>bladder</td>
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<tr>
<td>8</td>
<td>11+6</td>
<td>38</td>
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<td>3000</td>
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<tr>
<td>9</td>
<td>8+4</td>
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<td>yes</td>
<td>2500</td>
<td>bladder</td>
</tr>
<tr>
<td>10</td>
<td>8+5</td>
<td>37</td>
<td>no</td>
<td>1500</td>
<td>none</td>
</tr>
</tbody>
</table>

Natural History of early first-trimester pregnancies implanted in Cesarean scars

Case 2: ultrasound images obtained at 5 (a), 6 (b), 8 (c,d) and 18 (e) weeks’ gestation, showing gestational sac within gap of scar defect (a), growth of gestational sac into endometrial cavity (b), empty upper endometrial cavity and thin myometrium between gestational sac and bladder (c), high cord insertion (d), and loss of interface between myometrium and placenta with increased blood flow behind the placenta and placental lakes (e).

Natural History of early first-trimester pregnancies implanted in Cesarean scars

Case 5: ultrasound images obtained at 5 (a), 8 (b) and 9 (c) weeks’ gestation, showing placental lakes and bulging of gestational sac outside uterine contour (b,c), and at 26 weeks (d,e), showing large placental lacunae and velamentous cord insertion (arrow). Hysterectomy revealed area of placenta percreta and velamentous cord insertion (arrow) (f,g).

Natural History?

Management of CS pregnancies

- Expectant:
  - suitable for small, failed pregnancies
  - inaccessible failed pregnancies
  - women who decline intervention
Medical treatment

Advantages
- Preservation of fertility
- Reduce risk of intraoperative haemorrhage

Disadvantages
- Up to 12 months to resolve
- Prolonged bleeding
- Risk of sudden haemorrhage during follow up
- Success rates somewhere between 50-100%

Surgical treatment: techniques

Abdominal approach
- excision, laparoscopic or open hysterectomy
- Adjunctive treatments
- methotrexate
- uterine artery embolisation

Transcervical approach
- Hysteroscopic resection
- USS guided evacuation + tamponade

Transvaginal approach

Adjuvant treatments

Ideal surgical treatment

Fertility sparing
- Minimal complications
- Technically simple
- Reduce risk of recurrence
- Reduce morbidity in future pregnancies

Suction evacuation

9/108 cases required hysterectomy
- usually those undiagnosed prior to haemorrhage

58/108 required additional procedures

Suction evacuation: technique

- Misoprostol PR
- Infiltrate with bupivocaine 0.5% & adrenaline
- Insert modified Shirodkar suture without tying tape
- Continuous USS guidance
- Suction to remove decidua in cavity as per routine ERPC
- Gentle rotation of suction curette at level of scar
- Check with TVS / PRS for RPOC
- Tie suture if heavy bleeding, remove if not
- Remove suture in 3-7 days
- Prophylactic antibiotics

Prophylactic antibiotics
Suction evacuation

King’s & UCH patients

- 232 women with scar pregnancies
- gestation by dates (wks) = 7+4 (4+1-14+4)
- 191/232 (82.3%) of women were treated surgically

King’s & UCH patients: extended case series

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n=232</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ongoing pregnancy</td>
<td>123 (53%)</td>
</tr>
<tr>
<td>Heterotopic</td>
<td>9/232 (3.9%)</td>
</tr>
<tr>
<td>GSD (mm)* n=209</td>
<td>17.3 (3.0-74.0)</td>
</tr>
<tr>
<td>size of POC (mm)n=23</td>
<td>36.0 (15.0-58.0)</td>
</tr>
<tr>
<td>CRL (mm)* n=232</td>
<td>6.7 (2.3-72.0)</td>
</tr>
<tr>
<td>Surgical management</td>
<td>191 (82.3%)</td>
</tr>
</tbody>
</table>

* median, range 1997 – 2013

King’s & UCH patients: outcome

<table>
<thead>
<tr>
<th>Outcome</th>
<th>n=191</th>
</tr>
</thead>
<tbody>
<tr>
<td>Success</td>
<td>190 (99.5%)</td>
</tr>
<tr>
<td>Suture tied</td>
<td>82 (42.9%)</td>
</tr>
<tr>
<td>Foley catheter</td>
<td>3 (1.6%)</td>
</tr>
<tr>
<td>EBL (mL) med (range)</td>
<td>100 (10-3000)</td>
</tr>
<tr>
<td>EBL &gt; 1000 mL</td>
<td>20/191 (10.5%)</td>
</tr>
<tr>
<td>Blood transfusion</td>
<td>9/191 (4.7%)</td>
</tr>
<tr>
<td>Hysterectomy</td>
<td>1/191 (0.5%)</td>
</tr>
<tr>
<td>RPOC (n=116 attended)</td>
<td>18/116 (15.5%)</td>
</tr>
<tr>
<td>ERPC/rpt procedure</td>
<td>7/116 (6.0%)</td>
</tr>
</tbody>
</table>

King’s & UCH patients: predictors of morbidity

- Advancing gestational age
- Increasing gestational sac diameter
- Increasing CRL
- High vascularity
- Only GSD & vascularity remained significant at LR

Suction evacuation: future pregnancies

- Data available for 96 women
- 79 tried to conceive again
- 6 women had recurrent scar pregnancies (7.6%, 95% CI 0.9-11.7)
- 60/79 women conceived again with intrauterine pregnancies (75.9%)  
  - All but one had rpt CS, no cases of uterine rupture
Suction evacuation +/- cerclage

- Fertility sparing ✓
- Minimal complications ✓
- Technically simple ✓
- Reduce risk of recurrence x
- Reduce morbidity in future pregnancies x

Summary

- Complications tend to occur in undiagnosed / misdiagnosed cases
- The earlier the diagnosis of CSP the less complicated the treatment & more time for decision making
- Natural history poorly understood
- Suction evacuation +/- prophylactic cerclage simple technique – safe and effective
- Less invasive & fewer potential complications than excision or hysteroscopic resection
- Scar revision of uncertain benefit