Postpartum Laparoscopic Sterilisation: A Role in South African Health Care?

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Dr. RM Aronius
History of Postpartum Laparoscopic Sterilisation

1823 First tubal ligation for sterilisation suggested

1936 Development of mechanical sterilisation devices

1970 First studies on postpartum laparoscopic sterilisation: Keith et al. “readily acquired technique with minimal complications”


1986

1995 Merger et al: compared laparoscopic postpartum, interval and minilaparotomy on 27653 Swiss patients over 9 years

2007 Huber et al: 732 postpartum laparoscopic sterilisations under local anaesthesia in postpartum with Yoon rings

2014
Sterilisation in our population

- Rising BMI of RSA:
  - BMI >30
    - Women aged 15/older 12.5%
    - Urban African women 35.7%
    Mollentze, 2006

- Postpartum open vs. laparoscopic steri BMI >30
  - Procedures comparable with min complications
  - Duration of laparoscopic procedure less
  Garcia- Padial, 2004
Timing of Sterilisation

- Infection risk
- Regret:
  - CREST\(^1\) study:
    - 20.3% (≤30)
    - 5.9% (>30)
- Failure Rate

Laparoscopy vs. Minilaparotomy

- RCOG 2004:
  “Where equipment and trained staff are available, the laparoscopic approach to the fallopian tubes is quicker and results in less minor morbidity compared with minilaparotomy.”

- Cochrane 2009:
  - Experience
  - Purchase and maintenance
  - Fewer instances of minor operative morbidity
Retrospective case review of 27,653 sterilizations performed on women from over 60 hospitals in Switzerland over a 9 year period.

Divided procedures into 3 groups:
1. Interval laparoscopic sterilisation
2. Postpartum laparoscopic sterilisation (within 5 days of delivery)
3. Postpartum minilaparotomy sterilisation

Results focused on major and minor complications.
### Major complications

<table>
<thead>
<tr>
<th>Complications</th>
<th>Interval sterilization (n = 20325)</th>
<th>Postpartum laparoscopy (n = 2233)</th>
<th>Postpartum minilaparotomy (n = 5095)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unintended major surgery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bowel injuries</td>
<td>6 (0.03)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Stomach injuries</td>
<td>2 (0.01)</td>
<td>0</td>
<td>1 (0.02)</td>
</tr>
<tr>
<td>Ureter injuries</td>
<td>4 (0.02)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Blood vessels injuries</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Blood loss greater than 500 mL</td>
<td>7 (0.03)a</td>
<td>3 (0.13)</td>
<td>14 (0.27)</td>
</tr>
<tr>
<td>Febrile morbidity</td>
<td>1 (0.01)b</td>
<td>1 (0.05)</td>
<td>3 (0.06)</td>
</tr>
<tr>
<td>Life-threatening event</td>
<td>0c</td>
<td>0</td>
<td>2d (0.04)</td>
</tr>
<tr>
<td>Death</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total major complications</strong></td>
<td>20 (0.10)a</td>
<td>4 (0.18)</td>
<td>20 (0.39)</td>
</tr>
</tbody>
</table>

Data are reported as number (%).
- a  p < 0.001 between first and third column.
- b  p < 0.05 between first and third column.
- c  p = 0.052 between first and third column.
- d  Both were pulmonary emboli.
### Minor complications

<table>
<thead>
<tr>
<th>Complications</th>
<th>Interval sterilization (n = 20325)</th>
<th>Postpartum laparoscopy (n = 2233)</th>
<th>Postpartum minilaparotomy (n = 5095)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urinary tract infections</td>
<td>9 (0.04)^a^</td>
<td>1 (0.045)^b^</td>
<td>26 (0.51)</td>
</tr>
<tr>
<td>Abdominal wall hematoma</td>
<td>3 (0.02)^c^</td>
<td>1 (0.045)</td>
<td>4 (0.08)</td>
</tr>
<tr>
<td>Uterine injuries</td>
<td>37 (0.18)^d^</td>
<td>2 (0.09)</td>
<td>1 (0.02)</td>
</tr>
<tr>
<td>Ileus</td>
<td>1 (0.01)</td>
<td>1 (0.045)</td>
<td>1 (0.02)</td>
</tr>
<tr>
<td>Wound dehiscence</td>
<td>1 (0.01)^e^</td>
<td>1 (0.045)</td>
<td>10 (0.19)</td>
</tr>
<tr>
<td><strong>Total minor complications</strong></td>
<td><strong>51 (0.26)^a^</strong></td>
<td><strong>6 (0.27)^f^</strong></td>
<td><strong>42 (0.82)</strong></td>
</tr>
</tbody>
</table>

Data are reported as number (%).

- ^a^ \( p < 0.001 \) between first and third column.
- ^b^ \( p < 0.005 \) between second and third column.
- ^c^ \( p < 0.05 \) between first and third column.
- ^d^ \( p \leq 0.01 \) between first and third column.
- ^e^ \( p < 0.005 \) between first and third column.
- ^f^ \( p \leq 0.01 \) between second and third column.
Aim of our study

- Retrospective review looking at laparoscopic postpartum sterilisations that are being performed at Worcester Hospital in the Western Cape

- Assess if the procedure is feasible in our current healthcare setting in South Africa

- Assess if there are advantages to this procedure as compared to open minilaparotomy postpartum sterilisations - which is the currently the procedure most often performed for postpartum sterilisation in South Africa
Methods

- Retrospective review of all clinical records of patients undergoing both open and postpartum sterilisations between June 2012 and December 2013

- Postpartum sterilisation - within 72 hours of vaginal delivery

- Patient information was obtained through the theatre and labour ward registers and a computer database of surgeries performed at Worcester Hospital

- Clinical information was obtained from folders and entered into a data sheet after which all information regarding patient identification was removed

- Ethical approval
Sterilisations at Worcester Hospital (June 2012 - December 2013)

Total Sterilisations (N=425)
- Excluded - performed during caesarean (N=217)
- Excluded - performed with other procedure (N=8)
- Excluded - interval procedure (N=57)
- No notes/ old folder/ folder missing (N=47)
- Post-partum sterilisations (N=96)
  - Open post-partum sterilisations (N=26)
  - Laparoscopic post-partum sterilisations (N=52)
  - Excluded - incomplete data (N=18)
Laparoscopic Postpartum sterilisation with Falope Ring

- General anaesthesia
- Variables unable to audit
  - Consent
  - Preparation of patient
- Instruments used
  - General cost
  - Disposable sets
Laparoscopic Postpartum sterilisation with Fallope Ring
Laparoscopic Postpartum sterilisation with Fallope Ring
Laparoscopic Postpartum sterilisation with Fallope Ring
Results and Discussion

1. Demographic data - age, parity, BMI

2. Duration of surgery
   - Total
   - BMI ≥ 30
   - Group of Intermediate surgeons

3. Time postpartum before surgery

4. Length of hospital stay postoperatively

5. Complications
   - During surgery
   - Early (before discharge)
   - Late (after discharge including sterilisation failure)
Demographics

- Demographics similar between groups
- Higher BMI in laparoscopic group ?selection bias
- Maximum BMI in laparoscopic group 46
  - Worcester Hospital anaesthetic limit BMI 49 or less

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Open</th>
<th>Laparoscopic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>33,9 ± 5,4</td>
<td>33,9 ± 5,2</td>
</tr>
<tr>
<td>Body Mass Index (BMI)</td>
<td>26,2 ± 5,6</td>
<td>28,3 ± 6,9</td>
</tr>
<tr>
<td>Maximum BMI</td>
<td>38,8</td>
<td>46</td>
</tr>
<tr>
<td>Parity</td>
<td>4,5 ± 1,2</td>
<td>4,3 ± 1,0</td>
</tr>
</tbody>
</table>

Data reported as mean ± S.D.
Duration of Surgery

- From skin incision to skin closure

**Table 2: Duration of Surgery**

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>BMI&gt;30</th>
<th>Intermediate surgeons</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Open</strong></td>
<td>25,0 ± 9,52</td>
<td>29,5 ± 4,4</td>
<td>24,8 ± 1,8</td>
</tr>
<tr>
<td><strong>Laparoscopic</strong></td>
<td>21,3 ± 10,2</td>
<td>24,5 ± 2,3</td>
<td>25,4 ± 2,7</td>
</tr>
<tr>
<td><strong>Difference</strong></td>
<td>3,65</td>
<td>4,9</td>
<td>-0,65</td>
</tr>
<tr>
<td><strong>95 % CI</strong></td>
<td>-1,1-8,5</td>
<td>-5,3-15,2</td>
<td>-7,3-6,0</td>
</tr>
<tr>
<td><strong>P</strong></td>
<td>0,08</td>
<td>0,83</td>
<td>0,81</td>
</tr>
</tbody>
</table>

Data reported as mean ± S.D.

- Total duration in laparoscopic group 3,65 mins faster
- Duration in subgroup BMI ≥ 30: 5 mins faster. Correlates with case review by Garcia-Padial et al.
- Intermediate surgeons (COSMO, MO, Registrar)
  - Times comparable between open and Laparoscopic procedures
Average waiting time for procedure

<table>
<thead>
<tr>
<th>Table 3: Time surgery occurred Postpartum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>Open</td>
</tr>
<tr>
<td>Laparoscopic</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Data reported as mean ± S.D.

Length of postoperative stay before discharge

<table>
<thead>
<tr>
<th>Table 4: Length of Stay Post Surgery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>Open</td>
</tr>
<tr>
<td>Laparoscopic</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Data reported as mean ± S.D.
Total Complications

Table 5: Surgery Related Complications

<table>
<thead>
<tr>
<th></th>
<th>Open</th>
<th>Laparoscopic</th>
</tr>
</thead>
<tbody>
<tr>
<td>During Surgery</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Early Complications</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Late Complications</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>5</td>
<td>4</td>
</tr>
</tbody>
</table>

- OR 0.35
- 95% CI 0.08 - 1.14  P0.14
- Although not statistically significant correlates with previous literature
Complications

- During surgery:
  - Open: 3 complications:
    1. Bleeding from muscle and sheath
    2. Suture slipped with bleeding
    3. Difficulty finding tube
  - Laparoscopic: 3 complications
    1. Instrument failure
    2. Instrument failure
    3. Transection of tube with applicator - bleeding stopped with bipolar grasper
Complications

- Early complications (before discharge)
  - Open: 2 complications
    1. Post-operative pyrexia of unknown origin
    2. Wound haematoma
  
  - Laparoscopic: 1 complication
    1. Wound dehiscence and omental hernia needing closure
    (associated with 10mm umbilical port)

- Late complications

- No reported sterilisation failures- Follow up 5-24 months
Complications - intermediate surgeons

- All open complications associated with intermediate surgeons (number of sterilisations performed = 21)
- Only 1 of laparoscopic complications associated with intermediate surgeons (number of sterilisations performed = 20)
Surgical tips

- Ensure mechanism of applicator is working before procedure
- Vertical blade facing upwards when making skin incision
- Supraumbilical skin incision/Consider Palmer’s Point
- Pull tube slowly into applicator to avoid transection
- Check for fimbrial ends and round ligament
The future

- Patient acceptability
- Follow up of Sterilisation failure
- Local anaesthetic/ day procedure
- Quality improvement- failure to obtain desired PPS
- Training programme
- Long-term cumulative outcome study
“Each facility must determine which method of sterilisation is appropriate for its circumstances and context. In many countries, a combination of minilaparotomy, offered extensively in basic facilities and in rural areas with laparoscopy, provided in a few high-volume urban centers, may be most effective.”

WHO
Thank You
References

- Index Mundi. South Africa Demographics Profile 2013. [http://www.indexmundi.com/south_africa/demographics_profile.html](http://www.indexmundi.com/south_africa/demographics_profile.html) (accessed 12 May 2013)


- WHO: Female Sterilization, What Health Workers Need to Know. 1999

References


- Mollentze WF. Obesity in South Africa: A call for action. *Journal of Endocrinology, Metabolism and Diabetes of South Africa*. 2006; 11. (No. 2)


References


