Endometrial Necrosis Following B-Lynch Suture for Uterine Atony

Wenying Li*, Wenzhi Qin

Department of Obstetrics and Gynecology, Aviation General Hospital, Beijing, China

Email: *muziwen9999@163.com, muziwen9999@hotmail.com

Abstract

B-Lynch compression suturing was performed on a 30-year old primipara during emergency Cesarean section (CS). After CS, she developed a low-grade fever, a subinvolution and tenderness of the uterus, and a pronounced increase in the inflammatory markers. Antibiotics were altered according to bacterial cultures and drug sensitivity testing of the cervix. By 10 days postpartum, a diagnostic curettage was performed and released a foul-smelling liquid matter due to the substantial amount of heterogeneous material with gaseous echoes showed via ultrasonography. The inflammatory markers gradually returned to normal by 9 days post curettage. At 12-day post curettage, a foul-smelling purulent tissue was extruded spontaneously via the vagina and proved to be necrotic tissue on pathologic examination. Eighteen months after childbirth, the patient had not experienced a menstrual period or subsequent pregnancy and a small uterus without any evidence of an endometrium showed by ultrasonography.

Keywords

Cesarean Section, Infertility, Postpartum Care, Postpartum Hemorrhage, Postpartum Infections

1. Introduction

Postpartum hemorrhage (PPH) is the primary cause of maternal mortality worldwide and in China [1] [2] [3] [4]. As an effective, fertility-preserving treatment for PPH caused by uterine atony, the B-Lynch suture has been used for 20 years [1] [2] [3] [4]. Future fertility and the ability to become pregnant seem likely [5] [6]. Unfortunately, some rare, severe complications, such as persistent vaginal discharge, uterine necrosis, formation of synechia, and pyometra, have been reported and necessitated hysterectomy as the use of this technique...
This study stated and discussed another unusual complication as endometrial necrosis after B-Lynch suture for uterine inertia during cesarean section (CS).

2. Case Report

A 30-year-old primipara with well-controlled gestational diabetes was in labor and admitted to the hospital at 37 gestational weeks. She underwent an emergency CS for fetal distress 6 hours after admission; a fetus was delivered and all remnants of the placenta were easily separated from the inner lining of the uterus; however, the uterus became hypotonic and mild but constant bleeding proved to be unresponsive to uterine massage and immediate administration of oxytocin by 10 units intravenous drip and 20 units uterine injection followed by 100 microgram Carbetocin intravenous injection and two-dosage uterine injection of 250 microgram Carboprost Tromethamine with 15-minute interval. Therefore, we performed a B-Lynch procedure (compression suturing) and uterine tone and bleeding improved with a total uterine bleeding of no more than 700 milliliters (ml).

During the following 4 days postpartum, this primipara developed a low-grade fever (≤38˚C) and a pronounced increase in the following inflammatory markers: white blood cell count (WBC) of 19.4 to 21.9 × 10^9/L, neutrophil percentage (NEUT%) of 90.5% - 91.8%, and serum C-reaction protein (CRP) of 157 mg/L. (as Table 1 showed). Interestingly, she had no noticeable complaints or anemia except for a subinvolution and tenderness of the uterus. In this hospital, Cefuroxime Sodium was intravenously administered as routine after emergency CS.

Table 1. Change of serum white blood cell count (WBC, ×10^9/L), neutrophil percentage (NEUT%), serum C-reaction protein (CRP, mg/L), procalcitonin (PCT, ng/ml) and hemoglobin (HGB, g/L) after cesarean section (CS).

<table>
<thead>
<tr>
<th>Days after CS</th>
<th>WBC (×10^9/L)</th>
<th>NEUT%</th>
<th>CRP (mg/L)</th>
<th>PCT (ng/ml)</th>
<th>HGB (g/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>21.6</td>
<td>90.5</td>
<td>NA</td>
<td>NA</td>
<td>117</td>
</tr>
<tr>
<td>3</td>
<td>21.9</td>
<td>91.3</td>
<td>NA</td>
<td>NA</td>
<td>113</td>
</tr>
<tr>
<td>4</td>
<td>19.4</td>
<td>91.8</td>
<td>NA</td>
<td>NA</td>
<td>119</td>
</tr>
<tr>
<td>5</td>
<td>19.5</td>
<td>87.4</td>
<td>157</td>
<td>0.23</td>
<td>117</td>
</tr>
<tr>
<td>7</td>
<td>20.2</td>
<td>86.6</td>
<td>106</td>
<td>0.15</td>
<td>117</td>
</tr>
<tr>
<td>8</td>
<td>20.7</td>
<td>89.0</td>
<td>105</td>
<td>NA</td>
<td>124</td>
</tr>
<tr>
<td>16</td>
<td>13.8</td>
<td>82.2</td>
<td>93</td>
<td>NA</td>
<td>110</td>
</tr>
<tr>
<td>17</td>
<td>11.0</td>
<td>81.6</td>
<td>95</td>
<td>0.29</td>
<td>108</td>
</tr>
<tr>
<td>19</td>
<td>9.0</td>
<td>72.5</td>
<td>63</td>
<td>0.4</td>
<td>113</td>
</tr>
<tr>
<td>22</td>
<td>10.8</td>
<td>75.6</td>
<td>32</td>
<td>0.44</td>
<td>109</td>
</tr>
<tr>
<td>24</td>
<td>5.1</td>
<td>71.6</td>
<td>57</td>
<td>0.36</td>
<td>106</td>
</tr>
<tr>
<td>28</td>
<td>9.5</td>
<td>72.3</td>
<td>5</td>
<td>0.45</td>
<td>126</td>
</tr>
<tr>
<td>35</td>
<td>7.9</td>
<td>68.0</td>
<td>&lt;1</td>
<td>NA</td>
<td>119</td>
</tr>
</tbody>
</table>
At day-5 postpartum, antibiotics were altered to Ceftriaxone Sodium due to abnormal serum inflammatory markers; and then Levofloxacin was added according to bacterial cultures and drug sensitivity testing of the cervix which was tested as Escherichia coli. Because there was no improvement in uterine involution or inflammatory markers by 10 days postpartum, a transabdominal ultrasoundography was performed showing the uterine cavity to be filled with a substantial amount of heterogeneous material with gaseous echoes. Diagnostic curettage released a foul-smelling liquid matter without tissue being scraped out. Antibiotics were changed to Imipenem and Metronidazole intravenous drip based on the second round of bacterial cultures from uterine cavity which was tested as Enterococcus faecalis. During postpartum period, this young woman appeared good condition with no signs of toxemia; indeed, the WBC, NEUT%, and CRP gradually returned to normal by 9 days post curettage (now 19 days post CS) and antibiotics were withdrawn, although enlarged uterus continued and there was persistence of the same type of abnormal findings on ultrasonography.

At 12-day post curettage (22-day post CS), a foul-smelling mass of 15 × 12 × 4 cm³ of apparent purulent tissue was extruded spontaneously via the vagina which was proved to be necrotic tissue by pathologic examination. The second ultrasound-guided intrauterine exploration surgery was performed with large amount of foul smelling yellow pus out and the depth of uterine cavity was 14 centimeters. The third round bacterial culture from extruded tissue was tested as Pseudomonas putida and Escherichia coli. An additional 3 days of intravenous Levofloxacin and Metronidazole were administrated after the second postpartum surgery. Because she appeared to be well and was otherwise asymptomatic, she was discharged 35 days post-CS. At this time, her uterus was measured on ultrasonography at 7.9 × 6.2 × 3.0 cm³ without any clear evidence of an endometrium. During admission period, she never had temperature above 38˚C despite severe elevation of inflammatory markers. Ultrasonography performed 18 months after childbirth showed a small uterus without any evidence of an endometrium. She worried the adverse influence to her baby by multiple antibiotics and chose delactation since in hospital. During those 18 months the patient had not experienced a menstrual period or subsequent pregnancy.

The research has been approved by Ethic Committee of Aviation General Hospital and informed consent has been given by the patient (Figures 1-3).

3. Discussion

The management of postpartum hemorrhage must be as fast, simple, and conservative as possible. In case of medical treatment failure, the use of surgical procedures as compression suture is recommended. Due to the ease of implementation, B-Lynch suture has been disseminated worldwide. However, some complications have occurred [1] [2] [3] [4]. Our case is similar to a previous report. 9 Both women underwent a B-Lynch suturing for uterine atony and late,
persistent, bleeding of less than 1000 ml during CS. Neither of these patients de-
veloped any noticeable uterine involution by 3-week postpartum and uterine
 evacuation produced no findings, although there were abnormal intrauterine
echoes on ultrasonography. Although our patient was treated without removing
the uterus, the other patient underwent a hysterectomy at 2-month postpartum
[9]. Some gynecologists may argue that the decision to place a B-Lynch suture
may have been unwarranted for both women, because surgical intervention is
usually suggested only for cases in which uterine massage, uterotonics, and bal-
loon tamponade have failed [10]. Previous research has reported adoption of
B-Lynch for blood loss of 300 ml, which may be conducted by younger, less ex-
perienced obstetricians [6]. The indication(s) for the B-Lynch suture should be
re-visited, and surgical skills should be perfected via simulation training.
Our patient was very likely to be secondary amenorrhea though her uterus preserved. Severe postpartum hemorrhage at surgery may cause impairment of pituitary effects, which resulted in secondary amenorrhea. However, total blood loss was 700 ml and hemoglobin was normal at day 1 after surgery in our case, which cannot support the effect of central system to the secondary amenorrhea. In situ due to severe endometrial infection might be the most reasonable explanation for amenorrhea. Ultrasound image showed a small uterus without any evidence of an endometrium which provided further evidence.

Unlike uterine necrosis, our patient suffered only endometrial necrosis after B-Lynch suturing. Despite her symptoms and signs being mild, there were only slight, inadequate uterine involution and pronounced increases in the numbers of inflammatory markers. Uterine necrosis is very rare because of the markedly increased collateral circulation of the pregnant uterus [8]. Overtight suture may compromise the uterine morphology, vasculature and lochia eduction. The hematoma within the uterus might increase intrauterine pressure and compress the blood supply to the endometrium and might explain the endometrial necrosis in this patient. Lack of involution of uterus and increases in inflammatory markers may alert the physician the possibility of uterine endometrial necrosis; moreover, this adverse outcome might be avoided by early use of ultrasonography, an exploratory laparotomy, and ablation of the uterine compression sutures and evacuation the hematoma. The use of antibiotics in our patient may not have been suitable. She was given 6 different families of antibiotics successively for a total of 25 days. There is consensus that prophylactic antibiotics should be used for no more than 24 hours postoperatively for an uneventful CS. We felt that the prolonged use of antibiotics in this patient was justified because of the abnormal increase in inflammatory marker and positive bacterial culture results. Nevertheless, the long-term use of antibiotics may very well have played an im-

**Figure 3.** The image of tissue pathology at 22 days postpartum.
portant role in the uterine preservation, which was a great comfort to the para-
parity and her husband, though the question of fertility persists. For this rea-
son, the administration of broad-spectrum antibiotics may be an alternative to
hysterectomy among parous women who suffer such a serious, complicated pu-
erperal infection, despite the mild signs and symptoms.

In summary, our report shows that it is at least possible to preserve the uterus
when the patient has endometrial necrosis after placement of a B-Lynch suture
although the question of subsequent fertility remains. The lack of appropriate
involution of the uterus accompanied by increases in inflammatory markers
should be considered signs of either endometrial or uterine necrosis. Individual-
ized considerations should be taken into account for hysterectomy which might
be avoided by effective antibiotic administration and early use of ultrasonogra-
phy and evacuation.

Acknowledgements

We appreciate the patient who allowed us to use her data and the Drs GuoLan
Gao and LiQun Yu at the Aviation General Hospital for their comments on this
manuscript.

Disclosure

We received no funding for this work. All the authors certify that they have pa r-
ticipated sufficiently data collection, reference retrieval, and writing of the ma-
nuscript.

Conflicts of Interest

The authors have no competing interests to declare.

References

(2011) Uterine Compression Sutures for the Management of Severe Postpartum
https://doi.org/10.1097/AOG.0b013e318202c596

B-Lynch Uterine Compression Sutures in the Conservative Surgical Management of
https://doi.org/10.1007/s00404-014-3511-2

Atony. Journal of Obstetrics and Gynaecology: The Journal of the Institute of Ob-
stetrics and Gynaecology, 32, 338-341.
https://doi.org/10.3109/01443615.2012.673035

Uterine Compression Sutures for Postpartum Hemorrhage: An Overview. Acta Ob-
stetricia et Gynecologica Scandinavica, 92, 378-385.
https://doi.org/10.1111/aogs.12077


