Adhesion in Gynecology Complication, Cost, and Prevention: A Review

Baakdah H, Tulandi T

Surg Technol Int 2005;14: 185-190

Post-surgical adhesion formation is a major complication of abdominal or pelvic surgery. Adhesions can cause infertility, abdominal pain, or bowel obstruction. The total cost of adhesion-related problems in the United States is more than $1 billion dollars annually. Modification of surgical technique and the use of adhesion-reducing substances can reduce the risk of adhesion formation, but no substance has yet been shown to reduce the risk of bowel obstruction or reduce healthcare costs.

STUDY OBJECTIVE:
To review the prevalence of adhesions in gynecology practice, the resulting complications, cost for the health care, and methods to prevent adhesion formation.

METHODS:
A review of the relevant literature on intra-abdominal adhesions, adhesion-reducing substances, and their related costs.

RESULTS:
Prevalence
- The incidence of adhesions after minor, major, and multiple abdominal surgeries has been reported as 51%, 72%, and 93.0%, respectively. At least half of all adhesions reform after removal.

Complications
- Adhesions can cause infertility, intestinal obstruction, or chronic pelvic pain.
- Periadnexal adhesions can cause infertility, by impairing gamete transfer and ovum pick-up mechanisms. Most women with periadnexal adhesions require in-vitro fertilization to conceive. Intrauterine adhesions can also cause infertility, and in women with such adhesions who do conceive, pregnancy can be complicated by placenta previa or placenta accrete.
- Adhesions are present in approximately 20% of women with chronic pelvic pain, and up to 90% of women with severe adhesions experience relief of pain after adhesion lysis.
- Adhesions contribute to 40% of all intestinal obstructions and 60–70% of small bowel obstructions.

Cost
- Data from the 1994 National Hospital Discharge Survey showed that the total cost of adhesion-related problems in the United States was $1.3 billion dollars. Lysis of adhesions was responsible for 1% of hospital stays in the United States.
- Data from other countries show similarly high healthcare costs associated with adhesions and their complications.
Prevention

- Modification in surgical technique, such as the use of laparoscopy instead of laparotomy, can minimize adhesion formation. Non-closure of the peritoneum after laparotomy may also reduce the risk of adhesions

- Many substances and materials have been evaluated as adhesion-reducing agents in animal and human studies (Table). However, no adhesion-reducing substance has shown unequivocal efficacy. The use of these substances is also costly

Table. Most commonly used adhesion-reducing substances

<table>
<thead>
<tr>
<th>Material</th>
<th>Trade name</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Peritoneal instillates</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Ferric hyaluronic acid                       | Intergel™ (Lifecore Biomedical) | • No change in incidence of adhesions  
• Reduces severity of adhesions  
• Late-onset, post-operative pain |
| Hyaluronic acid                              | Sepracoat® (Genzyme)            | • Liquid and gel forms  
• Needs to be applied before injury  
• Efficacy limited to de novo adhesions |
| **Adhesion barriers**                        |                                 |                                                                          |
| Hyaluronic acid and carboxymethylcellulose   | Seprafilm® (Genzyme)            | • Blood insensitive  
• Brittle and sticky  
• Cannot be applied by laparoscopy |
| Oxidized regenerated cellulose               | GYNECARE INTERCEED® Absorbable Adhesion Barrier (TC7) | • The most studied material  
• Easy to handle  
• Blood sensitive |
| Expanded polytetrafluoroethylene             | Prelude™ (W. L. Gore; Gore-Tex surgical membrane) | • Very effective  
• Non reactive  
• Non degradable  
• Needs suturing  
• Difficult to apply by laparoscopy |

- No study has been published to date showing that the use of adhesion-reducing substances reduces the risk of bowel obstruction or long-term costs to the health-care system
GYNECARE INTERCEED® ABSORBABLE ADHESION BARRIER

INDICATIONS:
GYNECARE INTERCEED® Absorbable Adhesion Barrier is indicated as an adjuvant in open (laparotomy) gynecologic pelvic surgery for reducing the incidence of postoperative pelvic adhesions after meticulous hemostasis is achieved consistent with microsurgical principles.

CONTRAINDICATIONS:
The use of GYNECARE INTERCEED® is contraindicated in the presence of frank infection. GYNECARE INTERCEED® is not indicated as a hemostatic agent. Appropriate means of achieving hemostasis must be employed.

WARNINGS:
The safety and effectiveness of GYNECARE INTERCEED® Adhesion Barrier in laparoscopic surgery or any procedures other than open (laparotomy) gynecologic microsurgical procedures have not been established.

Postoperative adhesions may be induced by GYNECARE INTERCEED® application if adjacent tissues (e.g., ovary and tube) and structures are coapted or conjoined by the device, or if GYNECARE INTERCEED® is folded, wadded or layered. Postoperative adhesions may occur in the presence of GYNECARE INTERCEED® if meticulous hemostasis is not achieved prior to application. As with all foreign substances, GYNECARE INTERCEED® should not be placed in a contaminated surgical site.

PRECAUTIONS:
Use only a single layer of GYNECARE INTERCEED®, since multiple layers of packing or folding will not enhance the adhesion barrier characteristics and may interfere with the absorption rate of GYNECARE INTERCEED®. Care should be exercised in applying GYNECARE INTERCEED® to a pelvic organ not to constrict or restrict it. If the product comes in contact with blood prior to completing the procedure, it should be discarded, as fibrin deposition cannot be removed by irrigation and may promote adhesions formation. Ectopic pregnancies have been associated with fertility surgery of the female reproductive tract. No data exist to establish the effect, if any, of GYNECARE INTERCEED® on the occurrence of ectopic pregnancies. No adequate studies have been conducted in women who have become pregnant within the first month after exposure to GYNECARE INTERCEED®. No teratogenic studies have been performed. Therefore, avoidance of conception should be considered during the first complete menstrual cycle after use of GYNECARE INTERCEED®. The safety and effectiveness of using GYNECARE INTERCEED® in combination with other adhesion prevention treatments have not been clinically established. GYNECARE INTERCEED® is supplied sterile. As the material is not compatible with autoclaving or ethylene oxide sterilization, GYNECARE INTERCEED® must not be resterilized. Foreign body reactions may occur in some patients. Interactions may occur between GYNECARE INTERCEED® and some drugs used at the surgical site. Pathologists examining sites of GYNECARE INTERCEED® placement should be made aware of its usage and of the normal cellular response to GYNECARE INTERCEED® ‘to facilitate proper evaluation of specimens’.

ADVERSE REACTIONS:
The type and frequency of adverse events reported are consistent with events typically seen following surgery. Postsurgical adhesions may occur in the presence of GYNECARE INTERCEED®.

For more information, please consult your doctor or call 1-888-GYNECARE to speak with a nurse.
CR Approved 2-25-09