Understanding Pelvic Adhesions: How to Get Up to Date with Procedures, Codes

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Coding professionals routinely code abdominal or pelvic adhesions. Recent advances in treatment and a newly approved ICD-9-CM procedure code, however, bring the topic to the forefront. Is your knowledge current?

This article will explain what pelvic adhesions are, the surgical techniques for treating them, and new advancements in adhesion barrier application.

What Are Adhesions?

Adhesions are fibrous bands that connect tissues or structures together that are normally separate. These bands form during the body's normal healing process following any type of injury, such as surgical trauma. Adhesions frequently occur after pelvic or abdominal surgery but can also form in women with pelvic inflammatory disease (PID), endometriosis, or after radiation treatment for cancer.

Adhesion formation is common after pelvic surgery, but some procedures are more prone to adhesions than others. Surgical procedures likely to cause adhesions are surgery for ovarian, endometrial, and cervical cancer; surgical treatment of endometriosis; myomectomy; reconstructive tubal surgery; hysterectomy; and cesarean section. The most common sites of adhesion formation involve the ovary, pelvic sidewall, and fimbria section of the fallopian tubes. More extensive adhesions may develop between loops of bowel.

How Adhesions Form

When trauma such as surgery occurs to the peritoneum (the thin serous membrane that normally wraps around all the intra-abdominal organs), the mesothelial cells covering the peritoneum die. Then, new epithelial cells are attracted to the site of the injury to initiate the healing process.

The healing process in the peritoneum is quite different than the healing of the skin. During normal healing of the skin, healing occurs at the periphery of the injury and directly correlates with the size of the injury. However, while the peritoneum is healing, multiple "islands" of new mesothelial cells are scattered throughout the denuded surface, which continue to divide until the surface is covered by new mesothelium. This process is called reepithelization and takes approximately five to seven days after surgery.

During this period, an inflammatory exudate produced from the injured area accumulates and leads to the formation of a fibrin matrix, which may interconnect adjacent pelvic structures, leading to fibrin bands. Under normal circumstances, mesothelial cells secrete substances that prevent the formation of these adhesive bands. This process, however, is not always successful, and these fibrin bands persist, resulting in adhesion formation.

The extent of the peritoneal trauma, ischemia, and the presence of inflammation or infection is directly related to the risk of adhesions developing. The ischemia caused by disruption of blood flow due to cutting, coagulation, or tying of sutures can lead to inflammation and tissue necrosis. Foreign bodies from suture material or lint from sponges can also cause an inflammatory reaction in the body. Hemorrhage and raw surfaces also put the body at risk for adhesion formation. Any type of inflammatory response from disorders such as endometriosis and PID may also lead to adhesion formation.

Complications Result

Adhesion formation is certainly not a desirable outcome because it compromises the motility and normal function not only of the bowels, but also of the reproductive organs such as the fallopian tubes. This may result in a multitude of complications such as pelvic pain, dyspareunia, infertility, and bowel obstruction.

Adhesion formation may also complicate subsequent surgical procedures. Severe adhesions are related to prolonged operative and anesthesia time, risk of injury to the ureter, bowel, and bladder, increased risk of intra-operative bleeding, and prolonged recovery times. The presence of dense adhesions may preclude the performance of several laparoscopic procedures, which then have to be converted to open procedures.

Surgical Techniques

Meticulous adherence to sound surgical principles and techniques is important to reduce the incidence of adhesions. Some of these surgical techniques include:

- minimizing tissue handling
- using delicate instruments
- using magnification
- constant wetting of all tissues
- practicing meticulous hemostasis
- avoiding dry sponges
- minimizing foreign body material
- avoiding peritoneal grafts
- maintaining vascularity
- using fine, nonreactive sutures
- using barrier methods to separate raw surfaces

How Adhesion Barriers Work

Recently, scientists have been successful in developing products that have been highly effective in preventing adhesion formation. Adhesion barriers are synthetic materials that have been used to mechanically separate surgical surfaces. These barriers have been used for several years and have proven to be safe and effective in reducing adhesion formation.

These barriers are tissue compatible and do not induce inflammatory or immunogenic responses. They are easy to handle and generally adhere to tissue surfaces without the need of sutures that might induce foreign body responses or promote ischemia. The barriers also assist peritoneal healing and are easily absorbed within a short period of time. While these barriers have been successful in reducing adhesion formation, they do not eliminate the formation entirely.

Types of Adhesion Barriers

There are several types of adhesion barriers approved for laparotomy procedures that are routinely used for abdominal and pelvic surgery. The three main types of barriers used are Interceed, Intergel, and Seprafilm.

Interceed

Interceed is a lightweight, tissue- and satin-like fabric made from oxidized regenerated cellulose. This fabric becomes a gel within eight hours of application to form a protective coating during the critical healing time when adhesions may occur. No adverse reactions have been reported, and it is considered twice as effective as surgery alone in reducing adhesions. Interceed breaks down and is totally absorbed within 28 days.

Interceed should be applied carefully so that the device does not conjoin tissues. It should not be folded, wadded, or layered. It should be cut to size to allow 3 to 5 millimeter margins of overlap around the area. It is important that it is used in single layers at the end of the procedure. Interceed's effectiveness is compromised by the presence of blood.

Meticulous hemostasis is very important when using this fabric. If it has come into contact with blood, Interceed will turn black or brown within one to two minutes. In this case, it must be discarded and a new piece applied.

Many studies have been conducted that demonstrate the effectiveness of Interceed. In one study on second-look operations post reconstructive surgery, the use of Interceed was associated with a significant reduction in adhesion formation (37.5 percent versus 85.7 percent).1

Intergel

Intergel is a liquid gel-like solution of sodium hyaluronate gel and ferric chloride. It can be poured into the pelvis after surgery to separate and protect organs and tissues. The gel is distributed throughout the peritoneal cavity by the circulation of the peritoneal fluid. For this reason, it is easy to use and apply, and one of its particular benefits is that it can be used to cover broad surfaces. It is contraindicated in patients with pelvic or abdominal infection.

One study demonstrates that in a second-look laparoscopy six to 12 weeks after laparotomy, the number of patients with adhesions, the extent of adhesions, and the severity of adhesions were significantly reduced. The American Fertility Society score for adnexal adhesions was reduced by 59 percent in patients in whom the Intergel solution was used.2

Seprafilm

Seprafilm is a bioresorbable membrane approved for use in any open abdominal or pelvic surgery. As its name implies, it looks like a film or cellophane. The sheets are 4 by 6 centimeters and are prepared to fit the desired application site. This type of barrier may be technically more difficult to place than other types because it sticks together. The surgeon places it at the site of trauma and must obtain clean, dry instruments to aid in the adherence to tissue surfaces. The average procedure requires the preparation and placement of multiple adhesion barriers. It turns to gel in minutes and may cover traumatized tissue for up to seven days. Seprafilm retains its effectiveness in the presence of blood, and it is cleared from the body in less than 28 days.

In a multicenter study, treatment of patients with Seprafilm after myomectomy showed a significantly reduced incidence of adhesions as well as reduced severity, extent, and area of postoperative uterine adhesions. Seprafilm treatment was not associated with an increase in postoperative complications.3

Coding in the Inpatient Setting

ICD-9-CM procedure code 99.77, Application or administration of adhesion barrier substance, is assigned for this procedure in the inpatient setting. This code was approved and effective October 1, 2002. The code assignment is intended to be an additional code, and is never listed as the principal procedure. Code 99.77 does not affect the DRG assignment when used as an additional code.

Following is an example of correct coding: A 39-year-old female underwent a myomectomy for fibroid tumors identified as intramural leiomyomas. Two pieces of Seprafilm were used to cover the operative site. The correct coding in this case would be ICD-9-CM codes 218.1, 68.29, and 99.77. (See "It's All in the Documentation," below, for examples of documentation identifying the placement of adhesion barriers.)

With a clearer understanding of causes, treatment procedures, and a new code, coders should be well on their way to correctly coding adhesion barrier application.

It's All in the Documentation

The following excerpts from operative reports illustrate the type of documentation that identifies the placement of adhesion barriers. This type of documentation would indicate that the coding professional would assign code 99.77, Application or administration of adhesion barrier substance.

Example no. 1

The peritoneal cavity was thoroughly irrigated. One sheet of Interceed was placed in the posterior cul-de-sac overlying the areas of fulguration of endometriosis. Another piece of Interceed was placed over the uterine incision. Hemostasis was confirmed. The bowel was allowed to resume its normal

anatomic position. The abdominal muscles were approximated in the midline with #1 Vicryl, and the fascia was approximated with #1 Vicryl in a running fashion in two segments. The skin was approximated with 3-0 Vicryl in a subcuticular fashion. A sterile dressing was applied over the incision.

Example no. 2

Hemostasis was noted, and the pelvis was irrigated copiously with warm normal saline. All laparotomy sponges and instruments were removed from the abdomen, and two pieces of Seprafilm were used to cover the operative site. The fascia was closed with running #1 Maxon. Hemostasis in the subcutaneous tissue was noted, and the skin was closed with a subcutaneous 4-0 Vicryl suture on a Keith needle.

Notes

1. Sawada, T. et al. "Postoperative Adhesion Prevention with an Oxidized Regenerated Cellulose Adhesion Barrier in Infertile Women." *Journal of Reproductive Medicine* 45, no. 5 (2000): 387-9.

2. Johns, D.B. et al. "Reduction of Postsurgical Adhesions with Intergel Adhesion Prevention Solution: A Multicenter Study of Safety and Efficacy After Conservative Gynecologic Surgery." *Fertility and Sterility* 76, no. 3 (2001): 595-604.

3. Diamond, M.P. "Reduction of Adhesions after Uterine Myomectomy by Seprafilm Membrane (HAL-F): A Blinded, Prospective, Randomized, Multicenter Clinical Study (Seprafilm Adhesion Study Group)." *Fertility and Sterility* 66, no. 6 (1996): 904-10.

References

American Hospital Association Central Office on ICD-9-CM. *Coding Clinic for ICD-9-CM* 19, no. 4 (2002).

More information about adhesions is available at www.adhesions.com.

The Centers for Medicare & Medicaid Services. *ICD-9-CM Coordination and Maintenance Committee Summary Report*. November 1-2, 2001. Available online at http://cms.hhs.gov/paymentsystems/icd9/default.asp.

US Department of Health and Human Services Food and Drug Administration. *Guidance for Resorbable Adhesion Barrier Devices for Use in Abdominal and/or Pelvic Surgery; Guidance for Industry*. FDA, June 18, 2002. Available online at www.fda.gov/cdrh/ode/guidance/ 1356.html.

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