



Management of Adhesive Small Bowel Obstruction

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Abstract:

Adhesive Intestinal obstruction is common complication of abdominal surgeries with significant morbidity associated with poor quality of life and predispose to repeated hospitalization. Approximately 95% of adults who undergo abdominal surgery develop bowel obstruction.

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Introduction:

Peritoneal adhesions can be defined as fibrous tissue that connects surfaces or organs within the peritoneal cavity that are normally separated. Such adhesions are the results of a pathological healing response of the peritoneum upon injury (1).

Adhesive small bowel Obstruction is one of the most common problems facing general surgeons worldwide. About 93–100% of patients who undergo open abdominal surgery will develop adhesions postoperative, with these postoperative adhesions accounting for up to 75% of all causes of small bowel obstruction. While any abdominal surgery can potentially lead to adhesive small bowel obstruction. Open adnexal surgery (23.9%), ileal pouch anal

anastomosis (19.3%), and open total abdominal hysterectomies (15.6%), were shown to have the highest risk of adhesion-related readmission (2).

Intra-abdominal adhesions may be classified as congenital or acquired. Congenital adhesions are a consequence of embryological anomaly in the development of the peritoneal cavity. Acquired adhesions result from the inflammatory response of the peritoneum that arises after intra-abdominal inflammatory processes (e.g. acute appendicitis, pelvic inflammatory disease and exposure to intestinal contents), radiation and surgical trauma. It has been reported that the majority of acquired adhesions (about 90%) are post-surgical (3).

Many adhesions post surgical procedures may be asymptomatic or can lead to a broad spectrum of clinical problems, including intestinal obstruction, chronic pelvic or abdominal pain and female infertility, requiring re-admission and often additional surgery, while at the same time they can complicate future surgical procedures (4).

Adhesions are a leading cause of secondary infertility in women, accounting for 15% to 20% of cases. Pelvic adhesions may be a source of chronic lower abdominal and pelvic pain. Adhesions may preclude peritoneal dialysis or intraperitoneal chemotherapy should they be necessary. Extensive adhesions may preclude laparoscopic procedures and have been shown to increase blood loss, operative time, and risk of enterotomy in reoperative surgery. These patients are then at increased risk for postoperative complications and prolonged hospital stay (5).

The initial goal of management is to resuscitate and stabilize the patient by correcting fluid and metabolite imbalances. Decompression via nasogastric tube. Early imaging and clinical examination can provide information, not only for diagnosis but the need for surgery. It is clear that those patients who demonstrate clinical and/or radiological signs of strangulation at presentation must be operated immediately. The classic clinical signs and symptoms suggesting gut ischaemia of constant continuous pain (as opposed to colicky), abdominal wall guarding, fever, leucocytosis, metabolic acidosis with elevated lactate and elevated C-reactive protein may all be useful (6).

➤ Treatment modalities:

- **Non-operative management (Conservative);**

The cornerstone of non-operative management is NPO and decompression using a naso-gastric tube or long intestinal tube.

Non-operative management should further include fluid resuscitation, analgesics, correction of electrolyte disturbances, nutritional support, and prevention of aspiration and a regular clinical and imaging reassessment.

Patients who failure of conservative management, underwent operative management.

Failure of non-operative treatment

- 1) Persistent obstruction more than 72 h
- 2) NGT drainage volume more than 500 ml in 3rd day
- 3) Failure to passage of the contrast to the colon within 36 h
- 4) Development of peritonitis increased abdominal pain ,worsening fever and leukocytosis

All were considered indications for surgery(9)

- **Operative treatment;** Historically, open surgery has been the standard treatment for adhesive small bowel obstruction. In recent years, laparoscopic surgery for ASBO has been introduced. The potential benefits of laparoscopy include less extensive adhesion reformation, earlier return of bowel movements, reduced post-operative pain, and shorter length of stay. (10)

The appropriate selection of patients for laparoscopic or open exploratory laparotomy is essential, Laparoscopic adhesiolysis at small bowel obstruction is feasible but suitable only if performed by an experienced laparoscopic surgeon with selected

patients.(11)

Indeed, some authors have reported bowel injury in 6.3 to 26.9% of patients treated with laparoscopic adhesiolysis for ASBO. In a recent population-based study, bowel resections were significantly more frequent in laparoscopic surgery. Incidence of bowel resection was 53.5 versus 43.4% in laparoscopic versus open procedures (12).

The predictive factors for successful laparoscopic adhesiolysis are (13):

- Non-medial laparotomy (Mc Burney incision).

- Less than two laparotomies.

- One fibrous adhesion causing obstruction

On the other side, open exploratory laparotomy is indicated in :

- Number of laparotomies more than two

- The presence of multiple adhesions can be considered a relative contraindication .

- Presence of intestines necrosis due to the obstruction.

- Enormously dilated loops because they narrow the operative field.

- Serious comorbidity such as cardiovascular, respiratory and hemostatic disorders

Prevention of Adhesive Intestinal Obstruction

Post surgical adhesion not only brings huge financial burden to the patient's families, but also results in many troubles, such as chronic pain, female infertility and bowel obstruction to the patients (14).

The main approaches in the prevention of adhesions include; improvement of surgical techniques, limitation of the intra-abdominal organs trauma and application of adjuvant agents to reduce the formation of adhesions (15).

A. General principles

Intraoperative techniques such as avoiding unnecessary peritoneal dissection, avoiding spillage of intestinal contents or gallstones, and the use of starch-free gloves are basic principles that should be applied to all patients. Starched gloves are a significant risk factor for postoperative adhesions. (16).

In more than 7% of laparoscopic cholecystectomies there is accidental perforation of the gallbladder and spillage of gallstones and about one third of these patients will be discharged with retained intraperitoneal stones. In view of the limitations of the available clinical studies and the incriminating findings of experimental studies, every effort should be made to avoid accidental gallstone spillage and retrieve any spilled gallstones (17).

B. Surgical techniques

Prevention of fibrinolytic suppression can be achieved to a certain extent with microsurgical principles and techniques. The use of magnification, proper handling of tissues, constant irrigation, meticulous hemostasis, and the use of microsurgical instruments and fine nonreactive sutures are of extreme importance. Peritoneal reapproximation is now no longer recommended. After peritoneal tissue is resected, natural healing is associated with less adhesion formation than occurs after reapproximation with staplers or sutures(18).

C. Surgical approach

The surgical approach (**open vs laparoscopic surgery**) plays an important role in the development of adhesive SBO. Decreased adhesion formation after laparoscopic procedures has been attributed to the reduced presence of foreign bodies within the peritoneum that tend to stimulate more numerous and dense adhesions (19).

In addition, laparoscopic operations may lead to fewer adhesions because tissue trauma is much lower than laparotomy, so associated with less adhesion formation than laparotomy (20).

Even though laparoscopic procedures result in fewer adhesions than do laparotomy procedures, adhesions can develop even after laparoscopy. To minimize the formation of adhesions, good surgical technique involves the basic principles of microsurgery as mentioned previously. Alternatively, an early second-look laparoscopy can be useful for assessing the degree of postoperative adhesions, allow technically easy adhesiolysis, and result in lower adhesion scores, as shown by third-look procedures (20).

D. Anti-adhesion adjuvants :

Multiple agents have been developed to decrease the formation of adhesions with varying degrees of success. They achieve this result by one of two means. They either disrupt the inflammatory cascade or fibrin-forming process leading to adhesion formation, or they provide a mechanical barrier between affected tissues preventing their apposition (19)

1. Mechanical Barriers:

Adhesion barriers are adjuvants for peritoneal administration that can effectively reduce adhesion formation. Mechanical barriers are available in two forms: free-floating abdominal instillates or membrane barriers; both prevent adhesion formation by preventing tissue apposition during the period of peritoneal repair and adhesion development(21).

1. **Hyaluronic based solution:** it is a naturally occurring component of

peritoneal fluid that aids in tissue lubrication and structural integrity.

combines hyaluronic acid with ferric ion, increasing its viscosity and time spent in the peritoneal cavity. its low viscosity and high rate of peritoneal reabsorption make hyaluronic acid unsuitable for adhesion prevention. it was found to decrease the number, severity, and extent of postoperative adhesions after laparotomy. Adhesion prevention occurred not only at the sites of application but throughout the peritoneal cavity.

2. **Polyethylene glycol:** Gel barrier, easy to apply in both open and laparoscopic surgery reduces adhesion score in both general surgery and gynecological trials. Relative few and small studies, impact on long-term adhesion-related complications not described

3. **ACP gel :** is a new crosslinked derivative of hyaluronic acid that exhibits a higher viscosity in addition to hyaluronic acid's other beneficial properties (20)

2. Fibrinolytic agents and Anticoagulant :

Many anticoagulant compounds such as different heparins have been shown to prevent adhesions by inhibiting platelet aggregation and increasing serine esterase activity, which enhances fibrinolysis. Heparin has been suggested to moderate activation of the clotting cascade and reduce fibrin deposition contributing to the process of adhesion formation (22).

Other targets of the fibrin-fibrinolysis pathway include use of fibrinolytic drugs and plasminogen activating factor. These have been effective in a dose-dependent manner but are noted to impair wound healing. Since all fibrinolytic drugs can incite bleeding, acceptance for routine use in the prevention of post-operative adhesions is unlikely (22).

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