Effectiveness of Semisolid and Liquid Adhesion Barriers in Gynecologic Surgery: A Review of Historical and Current Literature

Victoria Lazarov MD[1,2], Emily M Hannah BS[1], Steven D Schwaitzberg MD[3]

[1]Jacobs School of Medicine and Biomedical Sciences at the University at Buffalo, [2] Icahn School of Medicine at Mount Sinai Department of Obstetrics and Gynecology, [3] University at Buffalo Department of Surgery

Introduction

There is significant overlap in the operative spaces of abdominal and gynecologic surgery. While adhesion formation is a universally accepted sequelae of abdominal surgery, gynecologic abdominopelvic surgeries, namely myomectomy, are known to be particularly adhesiogenic. [1,2,3] Despite adhesion barriers being approved for use in gynecologic surgery, their effectiveness, risks, and surgical application remains ambiguous; this holds true particularly for semisolid barriers with respect to laparoscopic approaches.[4] The content in this review has direct implications for surgeons working in any aspect of the abdominopelvic space. In turn, the aim of this study was to assess the effectiveness of liquid and semisolid adhesion barriers on reducing the post-operative incidence of adhesion formation and recurrence in women undergoing gynecologic surgery.

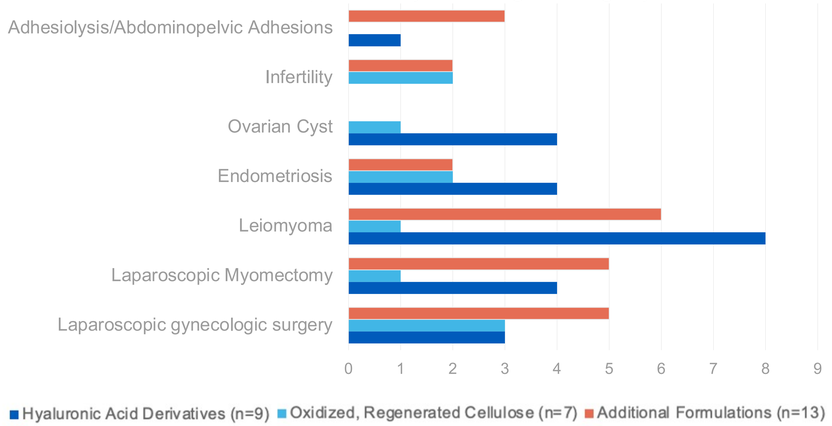
Methods

A PubMed and MEDLINE search identified 48 studies eligible for this review. Results were examined across three types of surgical interventions: abdominopelvic surgery (n=29), uterine surgery, and cesarean section, according to three main categories of adhesion barriers studied (hyaluronic acid derived, oxidized regenerated cellulose, and additional formulations).

Results

The most common reported indications for adhesion barrier use in abdominopelvic surgery by category can be seen in Figure 1. Types of adhesion barriers used within each category for abdominopelvic surgery can be seen in Figure 2A-C.

1 Reported Surgical Indications for Adhesion Barrier Use in Abdominopelvic Gynecologic Surgery



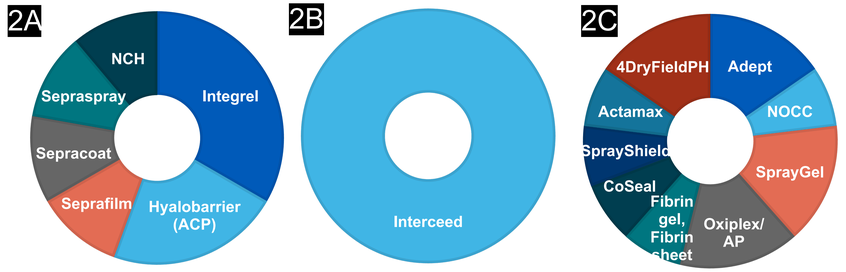


Figure 2. Adhesion Barriers used by Category in Abdominopelvic Gynecological Surgery (Fig. 2A: Hyaluronic Acid Derivatives. Fig. 2B: Oxidized, Regenerative Cellulose. Fig. 2C: Additional Formulations)

Overall, the use of an adhesion barrier decreased the incidence of adhesions at second look laparoscopy in 28/29 studies (96.6%) in abdominopelvic surgery. Use of semisolid or liquid adhesion barriers demonstrated a reduction in intrauterine adhesion frequency compared to no adhesion barrier. Adhesion barriers protected against adhesion formation at the following junctions: omentum-anterior abdominal wall, uterus-anterior abdominal wall, and uterus-bladder.

The most commonly studied class of anti-adhesion devices were hyaluronic acid-based products including Seprafilm, Sepracoat, Sepraspray, ACP, and NCH (Figure 2A). Of these, SprayGel/Shield, 4DryFieldPH, Oxiplex/AP, and CoSeal were most capable of reducing adhesion severity and extent, suggesting a potentially beneficial role for polyethylene glycol, a common component to these products, in the abdominopelvic cavity.

Conclusion

Despite the overwhelming improvement in adhesion frequency, severity, and extent demonstrated by the trials discussed in this review, these barriers are often not utilized in clinical practice, and more work should be done to assess the longitudinal risks and benefits of adhesion barriers for health systems and patients undergoing gynecologic surgery.

References

1. Okabayashi K, Ashrafian K, Zacharakis E, Hasegawa H, Kita- gawa Y, Athanasiou T. Adhesions after abdominal surgery: a systematic review of the incidence, distribution, and severity. Surg Today 2014;44:405–420. Doi:10.1007/s00595-013-0591- 8.
2. Lower AM, Hawthorn RJS, Clark D, Boyd JH, Finlayson AR, Knight AD, Crowe AM, Surgical and Clinical Research (SCAR) Group. Adhesion-related readmissions following gynaecological laparoscopy or laparotomy in Scotland: an epidemiological study of 24,046 patients. Hum Reprod 2004;19:1877–1885. Doi: 10.1093/humrep/deh321.
3. Dubuisson J-B, Fauconnier A, Chapron C, Kreiker G, Norgaard C. Second look after laparoscopic myomectomy. Hum Reprod 1998;13:2102–2106. Doi: 10.1093/humrep/13.8.2102.
4. Fossum GT, Silverberg KM, Miller CE, Diamond MP, Holmdahl L. Gynecologic use of Sepraspray Adhesion Barrier for reduction of adhesion development after laparoscopic myomectomy: a pilot study. Fertil Steril. 2011 Aug;96(2):487-91. Doi: 10.1016/j.fertnstert.2011.05.081.