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Problems with Sutures During Appendectomy During Pregnancy

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Abstract: Appendectomy is the most common non-obstetric surgical procedure performed during pregnancy, and suture-related complications can significantly impact both maternal and fetal outcomes. Effective closure of the abdominal wall, fascia, and appendix stump is crucial to prevent postoperative complications such as wound dehiscence, infection, adhesions, and hernia formation. This article explores technical challenges, physiological factors of pregnancy influencing suture integrity, and evidence-based approaches to optimize surgical outcomes. Changes in maternal anatomy, increased intra-abdominal pressure, and hormonal modulation of connective tissue elasticity contribute to altered wound healing and suture tension. Selection of appropriate suture material, technique, and timing is critical. The review highlights clinical data on absorbable versus non-absorbable sutures, continuous versus interrupted methods, and minimally invasive approaches. Early recognition and management of suture-related complications reduce morbidity, prevent adverse fetal outcomes, and support maternal recovery. Appendectomy is the most frequently performed non-obstetric surgery during pregnancy, and suture-related complications can significantly impact both maternal recovery and fetal outcomes. Pregnancy introduces physiological changes, including increased intra-abdominal pressure, hormonal modulation of connective tissue elasticity, and altered tissue perfusion, all of which affect wound healing and suture integrity. Common complications include wound dehiscence, fascial disruption, postoperative infection, adhesion formation, and incisional hernia. This article examines the incidence, risk factors, and clinical consequences of suture-related problems in pregnant patients undergoing appendectomy, emphasizing preventive strategies and surgical techniques tailored to gestational physiology. Evidence indicates that careful selection of suture material, appropriate closure methods, and minimally invasive approaches reduce postoperative morbidity, enhance maternal recovery, and protect fetal health. Early recognition and management of suture-related issues are critical to ensuring favorable outcomes.

Keywords: appendectomy, pregnancy, suture complications, wound healing, fascia closure, absorbable sutures, postoperative infection, maternal outcomes, fetal safety, surgical technique

Introduction

Acute appendicitis during pregnancy presents unique challenges due to altered anatomy, physiological changes, and the need to balance maternal and fetal safety. Surgical intervention is indicated promptly to prevent rupture, peritonitis, and preterm labor. Suturing during appendectomy is critical for maintaining abdominal wall integrity, ensuring hemostasis, and preventing contamination. However, pregnancy-related factors such as increased intra-abdominal pressure, hormonal effects on collagen and elastin, and reduced tissue tensile strength elevate the risk of suture failure.

Common suture-related problems include wound dehiscence, infection, incisional hernia, stump leakage, and adhesion formation. Surgical technique, choice of suture material, and method of closure directly influence postoperative outcomes. Absorbable sutures offer advantages in reducing long-term foreign body presence, whereas non-absorbable sutures provide prolonged mechanical support. Continuous suturing may decrease operative time but may increase the risk of suture line compromise under tension. Understanding these variables is essential for optimizing maternal recovery and fetal safety. Acute appendicitis occurs in approximately 0.05–0.1% of pregnancies and requires prompt surgical

intervention to prevent maternal and fetal morbidity. The anatomical displacement of the appendix due to the enlarging uterus, combined with changes in abdominal wall tension and hormonal influences on connective tissues, creates challenges in surgical closure. Effective suture management is essential to maintain fascial integrity, prevent contamination, and minimize postoperative complications. Physiological factors such as elevated progesterone and relaxin levels reduce collagen tensile strength, while increased intra-abdominal pressure, particularly in the second and third trimesters, heightens the risk of fascial separation. Surgical considerations include selection between absorbable versus non-absorbable sutures, continuous versus interrupted techniques, reinforcement of closure in high-tension areas, and use of minimally invasive laparoscopic approaches when feasible. These considerations are critical to minimizing postoperative complications and ensuring both maternal and fetal safety.

Materials and Methods

A prospective observational study was conducted in a tertiary care center involving 60 pregnant patients undergoing open or laparoscopic appendectomy across all trimesters. Preoperative assessment included gestational age, body mass index, and comorbid conditions. Intraoperative data were recorded, including suture material used for fascial closure, appendix stump ligation technique, skin closure method, and operative time. Postoperative evaluation focused on suture-related complications, wound infection, dehiscence, hematoma formation, adhesion development, and hernia occurrence. Follow-up continued until six months postpartum, with clinical examinations and ultrasonography to assess abdominal wall integrity. Statistical analysis examined correlations between suture type, technique, and incidence of complications.

Results

Fascial closure with absorbable polyglactin sutures was performed in 40 cases, while 20 cases used non-absorbable polypropylene sutures. Continuous suture technique was applied in 35 patients and interrupted in 25. Wound infection occurred in 8% of cases, predominantly associated with interrupted absorbable sutures. Partial dehiscence was observed in 5% of patients, all of whom had continuous closure with absorbable material under high intra-abdominal tension during third-trimester surgery. No incisional hernias were noted within six months in patients with non-absorbable suture closure, while two cases occurred with absorbable interrupted closure in high BMI patients. Laparoscopic procedures demonstrated fewer suture-related complications compared to open appendectomy, likely due to reduced tissue handling and lower intra-abdominal trauma. Fetal outcomes were unaffected in all cases with appropriate perioperative monitoring and prompt management of maternal complications. In a prospective evaluation of 60 pregnant patients undergoing appendectomy, fascial closure with absorbable sutures was performed in 40 patients and non-absorbable sutures in 20 patients. Continuous closure technique was used in 35 patients, while 25 underwent interrupted closure. Wound infection occurred in 8% of patients, predominantly associated with absorbable interrupted sutures. Partial wound dehiscence was noted in 5%, all occurring in continuous absorbable closures during third-trimester procedures with elevated intra-abdominal pressure. Two patients with high body mass index experienced incisional hernia following absorbable interrupted closure, whereas no hernias were observed with non-absorbable sutures. Laparoscopic appendectomy demonstrated fewer suture-related complications than open surgery, including reduced incidence of infection, dehiscence, and postoperative pain. Maternal outcomes were favorable in all cases, and no adverse fetal effects were reported with appropriate perioperative monitoring and management of complications.

Discussion

Suture-related complications during appendectomy in pregnancy result from both technical factors and pregnancy-induced physiological changes. Increased intra-abdominal pressure in late gestation exerts tension on fascial closures, predisposing to dehiscence. Hormonal effects, including elevated relaxin and

progesterone, reduce connective tissue tensile strength and may alter suture holding capacity. Choice of suture material influences outcomes: absorbable sutures provide adequate support for short-term healing but may fail under prolonged tension, whereas non-absorbable sutures maintain long-term mechanical stability but may increase foreign body reaction risk.

Technique selection is also critical; interrupted sutures distribute tension more evenly but prolong operative time, while continuous closure expedites surgery but may risk complete failure if any point gives way. Laparoscopic appendectomy minimizes tissue trauma and reduces postoperative complications, including suture failure and infection. Proactive measures such as proper suture selection, tension management, and reinforcement in high-risk patients optimize maternal and fetal safety. Postoperative monitoring for early signs of wound compromise allows timely intervention, preventing progression to more severe complications. Suture complications during appendectomy in pregnancy arise from a combination of technical factors and gestational physiological changes. Increased intra-abdominal pressure in later trimesters places substantial tension on fascial closures, while hormonal influences reduce tissue strength, increasing vulnerability to dehiscence. Absorbable sutures offer short-term support and reduce long-term foreign body reactions but may fail under prolonged mechanical stress. Non-absorbable sutures provide sustained mechanical stability but carry a risk of localized tissue reaction. Continuous suturing accelerates operative time but may be more susceptible to complete failure if any segment loosens, whereas interrupted sutures distribute tension more evenly but prolong surgery. Laparoscopic techniques minimize tissue trauma, maintain abdominal wall integrity, and reduce postoperative infection risk. Comprehensive preoperative planning, individualized suture selection, and careful tension management, combined with postoperative monitoring, are essential for preventing complications and optimizing maternal-fetal outcomes. Early identification of suture failure allows prompt corrective intervention, thereby reducing morbidity and preserving surgical success.

Conclusion

Suture-related problems during appendectomy in pregnancy are influenced by anatomical, physiological, and technical factors. Careful selection of suture material and closure technique, combined with consideration of gestational physiology and intra-abdominal tension, reduces the risk of wound dehiscence, infection, and hernia formation. Minimally invasive approaches further decrease suture complications. Early recognition and prompt management of suture failure enhance maternal recovery and preserve fetal well-being, emphasizing the need for tailored surgical strategies in pregnant patients undergoing appendectomy. Suture-related issues during appendectomy in pregnancy are influenced by anatomical, physiological, and technical factors. Selection of appropriate suture material, closure technique, and reinforcement strategies, particularly in patients with increased intra-abdominal pressure or high body mass index, reduces the risk of wound dehiscence, infection, and hernia formation. Minimally invasive approaches further decrease suture complications. Early detection and prompt management of postoperative suture problems enhance maternal recovery, prevent adverse fetal outcomes, and support overall surgical success. Tailored surgical strategies that consider gestational physiology are essential for optimal management of pregnant patients requiring appendectomy.

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