Relaparotomy after initial surgery in obstetric and gynecologic operations: analysis of 113 cases

Relaparotomia po pierwotnym leczeniu chirurgicznym w położnictwie i ginekologii: analiza 113 przypadków

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Abstract

Condensation: *Even though relaparotomy is unavoidable in some cases, several measures such as careful surgical technique, meticulous hemostasis and aseptic conditions must be undertaken to prevent unnecessary interventions in obstetrics and gynecology.*

Objective: *To assess the indications, procedures, risk factors and outcome for relaparotomy after obstetric and gynecological operations.*

Study Design: *A retrospective observational study during a four-year period in a tertiary care center was performed. Demographics such as age, parity, and indications for relaparotomy as well as outcome measures in terms of complications and mortality rates were assessed in 113 patients who had undergone a relaparotomy after the initial obstetric or gynecological surgery.*

Results: *The overall incidence of mortality after relaparotomy was 3.5%. Leading indications for the initial operation included placental abruption in 10 cases (8.8%), followed by the HELLP syndrome and previous cesarean section both in 5 cases (4.4%), and postpartum atonia in 4 (3.5%). The most common operations performed initially were cesarean section in 78 cases (69.0%) and 31 hysterectomies (27.5%). Principal indications for relaparotomy were bleeding and hematoma in 80 cases (70.8%) and abscess in 10 cases (8.8%). The most frequently performed procedures at relaparotomy were drainage and resuturing of hematomas (n=42, 37.1%), hypogastric artery ligation (n=32, 28.3%), hysterectomy (n=31, 27.5%), and drainage of abscess (n=7, 6.2%). A second relaparotomy was performed in 4 cases (3.5%). Complications were encountered in 4 patients and 4 cases ended up with mortality.*

Conclusion: *Hemorrhagic and infectious complications were the main indications for relaparotomy after obstetric and gynecologic surgeries. Cases with a history of placental abruption, HELLP Syndrome and previous cesarean section were under risk for relaparotomy. Despite favourable outcome, preventive measures such as careful surgical technique, meticulous hemostasis and aseptic conditions should be undertaken.*

Key words: **relaparotomy** / **obsterics** / **gynecology** / **cesarean section** / **indication** /

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Streszczenie

Chociaż relaparotomia jest w niektórych przypadkach nie do uniknięcia, powino się podjąć wszelkie środki, takie jak: dokładna technika operacyjna, skrupulatna hemostaza i warunki aseptyczne, aby zapobiec niepotrzebnym interwencjom w położnictwie i ginekologii.

Cel: *Ocena wskazań, procedur, czynników ryzyka i wyników leczenia relaparotomią po operacjach ginekologicznych i położniczych.*

Metoda: *Przeprowadzono retrospektywne badanie obserwacyjne w ciągu 4 lat w ośrodku III stopnia referencyjności. Dane demograficzne, takie jak: wiek, rodność, wskazania do relaparotomii oraz jej wynik w postaci powikłań i śmiertelności, oceniono u 113 pacjentek operowanych ponownie po pierwotnej operacji położniczej lub ginekologicznej.*

Wyniki: *Ogólna częstość zgonów po relaparotomii wynosiła 3,5%. Wiodącym wskazaniem do pierwotnej operacji było oddzielenia łożyska w 10 przypadkach (8,8%), następnie zespół HELLP i cięcie cesarskie w wywiadzie – oba po 5 przypadków (4,4%), oraz atonia poporodowa w 4 (3,5%). Najczęściej wykonaną pierwotną operacją było cięcie cesarskie – 78 przypadków (69%) i usunięcie macicy – 31 (27,5%). Głównym wskazaniem do relaparotomii było krwawienie i krwiak w 80 przypadkach (70,8%) oraz ropień w 10 przypadkach (8,8%). Najczęściej wykonywanymi procedurami podczas relaparotomii były: drenaż i ponowne założenie szwów na miejsca krwawiące (n=42, 37,1%), podwiązanie tętnicy podbrzusznej (n=32, 28,3%), usunięcie macicy (n=31, 27,5%), i ewakuacja ropnia (n=7, 6,2%). Ponowna relaparotomia była przeprowadzona w 4 przypadkach (3,5%). Powikłania dotyczyły 4 pacjentek i 4 pacjentki ostatecznie zmarły.*

Wnioski: *Powikłania krwotoczne i infekcyjne były głównym wskazaniem do relaparotomii po pierwotnych operacjach ginekologicznych i położniczych. Przypadki z przedwczesnym oddzieleniem łożyska, zespołem HELLP i cięciem cesarskim w wywiadzie były związane z większym ryzykiem relaparotomii. Pomimo korzystnych wyników, powinno się podjąć środki zaradcze w postaci dokładnej techniki operacyjnej, skrupulatnej hemostazy oraz zapewnienie warunków aseptycznych.*

Słowa kluczowe: **relaparotomia** / **położnictwo** / **ginekologia** / **cięcie cesarskie** / / **wskazania** /

Introduction

Early recognition and treatment of postoperative complications which can necessitate surgical reoperation are important in order to achieve a successful outcome. The term 'relaparotomy' (RL) refers to laparotomy performed for the original disease within 60 days of the first operation, whereas the term 'early RL' refers to laparotomy performed for the original disease within 21 days of the first operation [1].

The purpose of RL is to manage complications of the previous surgery, maintain intestinal continuity, prevent fecal contamination of the abdomen, relieve intestinal obstruction, maintain homeostasis, prevent intra-abdominal infection or sepsis, and carry out delayed curative surgery. However, inappropraite selection of patients for relaparotomy - especially for those who will not clearly benefit from the reoperation - can be deleterious. In these circumstances, the mortality risk factors can be different from those of the first operation. Not only the challenging decision to reoperate, but also the performance of this relaparotomy should be undertaken by experienced surgical staff [1,2].

Over the last few decades the incidence of cesarean section (CS) deliveries has shown a dramatic increase throughout the world. While the safety of CS has increased considerably, it is still a major operation, associated with certain risk and complications [3]. One of the important dangers of cesarean section is relaparotomy after operation. Relaparotomy in the early postoperative period is one of the rarest types of short-term complications after obstetric and gynecological interventions; and there is limited data pertaining to this issue in the literature [3-6]. Not only cesarean sections, but also many other surgical interventions may bring the necessity of relaparotomy in obstetric and gynecology practice.

The objective of the present study was to identify the indications, procedures, risk factors and outcomes of relaparotomy following an initial surgical intervention, both in order to avoid unnecessary operations and to improve the quality of care in obstetrics and gynecology.

Material and mathods

This article is an audit of relaparotomies performed at the Department of Obstetrics and Gynecology of a tertiary care center during a 4-year period between 2006 and 2010. Data were collected both retrospectively and prospectively at the moment when the relaparotomy was performed. The approval of the Institutional Review Board was obtained before the study.

Results

The overall mortality incidence after relaparotomy was 3.5%. The average age of the patients was 34.5±8.8 years (range, 17-63). The average number of gravidas was 5.1±3.4 (range, 0-14). The average number of parities was 4.4±3.3 (range, 0-14). The initial operation was carried out in another center in 91 cases (80.5%) and in our clinic in 22 cases (19.5%).

The most common operation performed initially was cesarean section in 78 cases (69.0%) followed by 24 total abdominal hysterectomies (21.2%), 4 subtotal hysterectomies (3.5%) and 3 vaginal hysterectomies (2.6%). Leading indications for the initial operation were placental abruption in 10 cases (8.8%) followed by HELLP Syndrome in 5 cases (4.4%), previous history of cesarean section in 5 cases (4.4%) and postpartum atonia in 4 cases (3.5%). Indications for relaparotomy were bleeding and hematoma in 80 cases (70.8%), uterine atonia in 12 cases (10.6%) and abscess in 10 cases (8.8%). (Table I).

Table I. Indications/main reasons for relaparotomy.

Indication	No. of cases	Percentage
Bleeding and hematoma	80	70.8%
Postpartum atonia	12	10.6%
Abscess	10	8.8%
Others*	11	9.8%

*Others include circumstances such as perforation of bowels, disseminated intravascular coagulation, endometritis and ligation of ureter.

Table II. Procedures performed during relaparotomy.

Procedure	No. of cases	Percentage
Drainage and re-suturing of hematomas	77	68.1%
Subtotal abdominal hysterectomy	16	14.2%
Total abdominal hysterectomy	15	13.3%
Drainage of abscess	7	6.2%
Salpingo-oophorectomy	7	6.2%
Excision of cervix	5	4.4%
Others**	21	18.6%

** Others include procedures such as ligation of proper ligament of ovary, repair of fistula, placement of double J catheters, hemicolectomy, and urteroneocystostomy. Multiple procedures may have been performed for one patient.

Procedures performed at relaparotomy were drainage and resuturing of hematomas (n=42, 37.1%), hypogastric artery ligation (n=32, 28.3%), subtotal abdominal hysterectomy (n=16, 14.2%), total abdominal hysterectomy (n =15, 13.3%), drainage of abscess (n=7, 6.2%), unilateral salpingo-oophorectomy, (n=6, 5.3%) and excision of the cervix (n=5, 4.4%). (Table II).

A second relaparotomy (re-relaparotomy) was performed in 4 cases (3.5%) with presumptive diagnoses of bleeding in 3 cases and DIC in 1 case. The average amount of blood transfusion was 5.4 units (ranging from 2 to 14 units).

Complications encountered in the follow-up priod of patients were acute renal failure in 3 cases and pneumonia in 1 patient. Of the 4 cases ending up with mortality, 2 had abscesses, 1 had a perforation of colon and 1 had pneumonia. The majority of the complications were cases related to hemorrhage and were detected at the early postoperative period.

Discussion

Complications are inevitable in surgery. In some circumstances, they may call for a relaparotomy, requiring the patient to go back to the operating room [7]. In the literature, there is a scant amount of data available on relaparotomy following cesarean delivery [3-6]. In this study, we critically assessed cases of relaparotomy after not only cesarean section, but many surgical procedures in our obstetric and gynecology practice. Hence, identification of the risk factors for relaparotomy is possible and effective precautions can be taken. The goal of RL is to manage complications of the previous surgery, prevent intra-abdominal infection or sepsis, maintain homeostasis and carry out delayed curative surgery [1, 2].

For relaparotomies, mortality clusters around digestive, urologic, and trauma patients with regard to the initial operation [7]. However, obstetrical and gynecological interventions are not always safe in these terms either. Our study revealed an overall mortality rate of 3.5% for cases undergoing relaparotomy, which is a noteworthy rate. In our series, all of the 4 cases ending up with mortality had an infectious component of complication. Local infectious problems such as abscesses and perforation of the colon must be handled meticulously and in cooperation with infectious diseases discipline. Conditions involving other organs such as pneumonia should not be ignored to eliminate infectious foci effectively. It can be inferred that the development of systemic sepsis, systemic inflammatory response syndrome, and multiple organ failure maintain a high rate of mortality after relaparotomies despite the advances in critical care, surgical technique and antibiotics.

The incidence of relaparotomy in this study was 0.72%, which is similar to the previously published studies (0.39–0.73%) [1–2]. Cesarean section on demand has become an increasingly common option for obstetrical patients recently [6]. However, physicians should be mindful of and inform the patient about the complications, mortality and morbidity rates associated with the cesarean delivery in comparison to vaginal delivery. The CS procedure should be performed selectively for appropriate and necessary cases. It has been suggested that the indications for CS are often for social or inappropriate reasons [6].

The World Health Organization (WHO) recommends that the CS rate should be no higher than 15% [4-6]. Another factor that would decrease the rate of CS is encouragement of vaginal birth after a previous cesarean section.

Indications for relaparotomy are scarce and stereotyped [1, 2]. We found that hemorrhagic etiology such as bleeding and hematoma are the leading causes for relaparotomy. Bleeding can originate from hypogastric, epigastric or uterine arteries, or the incision site may be involved. Relaparotomy for septic complications is a special condition that should be evaluated separately. Indications such as hemorrhage and wound dehiscence for relaparotomy bring about a lower rate of mortality compared to septic patients. There has been some controversy about planned vs. on-demand strategy in relaparotomies for sepsis. Regardless of the type of operation, the crucial point is the elimination of the infectious source as soon as possible [1, 2, 7].

There is no consensus in the literature regarding the timing of relaparotomy and its influence on the prognosis [1, 2, 7]. Early reoperations do not produce better results in every case. On the contrary, conservative treatment with close supervision before reoperation may prove the most prudent course considering the high mortality of relaparotomy [7]. The interval between the initial operation and relaparotomy is one of the most significant factors influencing the outcome [3]. Scarcity of information about the time course between the initial operation and relaparotomy is one of the limitations of our study. The severity of the general

condition of the patient and presence of septic component play a more important role in the outcome [2].

Securing hemostasis is a must for a safe and successful surgery. Obstetricians should use blunt dissection of subcutaneous tissue and unipolar coagulation after the delivery of the infant [5, 6]. More than 70% of cases in our series underwent relaparotomy due to complications related to hemorrhage. This rate is consistent with the literature [4-6]. Bleeding into the abdomen (12 patients), post-operative hematoma in the abdomen or abdominal wall (9 patients), uterine atony (3 patients), and hemorrhage due to complete placenta previa (2 patients) constituted 74.3% of all cases. This rate was between 66 and 83% in prior studies [4-6]. Bleeding secondary to atony or placenta previa bleeding are unpreventable situations, but complications of bleeding into the abdomen or hematoma formation, depend on the surgeon, surgical techniques and tissue factors [6]. It was concluded that the best possible closure technique includes the following: a mass closure (compared to a layer closure), a simple running suturing technique, use of absorbable monoflament suture material and a suture length-to-wound length ratio of 4:1 [6, 7]. Compliance with these recommendations, along with careful manipulation and enrollment of experienced staff in relaparotomy cases, may yield better outcomes with decreased incidence of relaparotomy.

Incidental ureter and bladder lacerations may occur, despite preoperative Foley catheter drainage, resulting from adhesions from prior abdominal procedures, inferior extension of the uterine incision or an inadvertent dissection. Postrepair integrity should be assessed with retrograde filling by methylene blue. A Foley catheter should remain in situ for a week in order to facilitate complete healing [2, 3].

Postoperative surgical site infections are considerable, especially during the late period. Surgical time exceeding 38 min and a body mass index of >30 are unpreventable and patient-dependent factors [1, 2].

In our series, one of the fatal cases had a history of perforation of recto-sigmoid colon. This type of damage can be a source for peritonitis and sepsis, therefore attention must be paid not to damage other abdominal organs during surgery [7].

In case of our study, the most important factors leading to relaparotomy were previous CS, placental abruption and the HELLP Syndrome. Surgical risk of adhesions following previous abdominal surgeries and homeostasis and related hematological conditions in cases of placental abruption and HELLP Syndrome may be the underlying causes. We had 10 cases with the history of placental abruption, 5 of cesarean section and 5 of the HELLP Syndrome.

P-POSSUM scores have been previously used to evaluate the surgical risk in elective cases. This scoring system may help to assess the general condition of the patient before relaparotomy. Even though we did not utilize this system in our study, we believe it may be beneficial for the foresight and prognosis in selected cases [7].

In the literature, the presence of tachycardia, abnormal temperature, the need for mechanical ventilation, vasoactive drugs, parenteral nutrition or antibiotics, abnormal white blood cell count, hyperbilirrubin, hypoalbuminemia, increased creatinine levels, or low prothrombin time or platelet count previous to reoperation were reported to be associated with mortality after relaparotomy [7].

On the other hand, anemia or elevated reactive C protein levels showed no association with mortality [1, 2]. Lack of correlation of hematological or biochemical parameters to outcome in relaparotomies is another limitation of our study. Measurement of biomarkers such as procalcitonin or cytokines may be useful in prediciton of outcome of surgery [7]. Other limitations of our study are the relative heterogeneity of the patients included, that may have affected the overall mortality rate. Every case facing reoperation should be taken into account carefully and individiually. On the other hand, we think that knowledge of predictors for mortality is important if a reoperation has to be done. If a patient has many risk factors for death and a reoperation is likely; the initial operation technique could be modified, an experienced and appropriately skilled team may be reassigned, or the operation rescheduled if some of the risk factors can be eliminated. If elimination of the former parameters seems to be impossible, awareness of the individual risks factors for a reoperation is still beneficial for a healthier communication with the patient and patient relatives as well as with the rest of the team in charge of the patient.

Conclusion

Relaparotomy is a rare condition with a limited likelihood of prevention in surgical practice of obstetrics and gynecology. Patients who had placental abruption and those with previous CS¸ are more likely to be at risk of relaparotomy. If adequate attention had been paid to thorough hemostasis at the time of the primary surgery, considerable number of relaparotomies might be avoided.

Infectious complications such as abscesses and colon perforation have a significantly higher rate of mortality. These findings must be taken into account at the time of decision making and counseling the patient before a relaparotomy is performed.

References

1. Unalp H, Kamer E, Kar H, [et al.]. Urgent abdominal re-explorations. *World J Emerg Surg.* 2006, 1, 10.
2. Unalp H, Kamer E, Onal M. Analysis of early relaparotomy after lower gastrointestinal system surgery. *Surg Today.* 2008, 38, 323-328.
3. Seal S, Kamilya G, Bhattacharyya S, [et al.]. Relaparotomy after cesarean delivery: Experience from an Indian teaching hospital. *J Obstet Gynaecol Res.* 2007, 33, 804–809.
4. Seffah J. Re-laparotomy after cesarean section. *Int J Gynecol Obstet.* 2005, 88, 253-257.
5. Gedikbasi A, Akyol A, Asar A, [et al.]. Re-laparotomy after cesarean section: operative complications in surgical delivery. *Arch Gynecol Obstet.* 2008, 278, 419-425.
6. Lurie S, Sadan O, Golan A. Re-laparotomy after cesarean section. *Eur J Obstet Gynecol Reprod Biol.* 2007, 134, 184-187.
7. Martínez-Casas I, Sancho J, Nve E, [et al.]. Preoperative risk factors for mortality after relaparotomy: analysis of 254 patients. *Langenbecks Arch Surg.* 2010, 395, 527-534.