“OPEN ABDOMEN” TACTICS FOR DISSEMINATED PERITONITIS: INDICATIONS, COMPLICATIONS, AND TREATMENT RESULTS

Mustafakulov Ishnazar Boynazarovich, Tokhirov Sheroz Mardonkulovich, Djuraeva Zilola Aramovna
Samarkand State Medical University and Termez Branch of Tashkent State Medical University

https://doi.org/10.5281/zenodo.19094455

Abstract: The open abdomen approach is used for the most severe forms of disseminated peritonitis, accompanied by abdominal sepsis and intra-abdominal hypertension syndrome. The aim of this study was to evaluate the indications, complication rates, and clinical efficacy of the open abdomen approach in patients with disseminated peritonitis. It was found that this approach is justified when the indications are strictly followed; however, it is associated with a high complication rate and requires an individualized approach and dynamic patient monitoring.

Keywords: open abdomen, laparostomy, generalized peritonitis, abdominal sepsis, intra-abdominal hypertension.

ТАКТИКА «OPEN ABDOMEN» ПРИ РАСПРОСТРАНЁННОМ ПЕРИТОНИТЕ: ПОКАЗАНИЯ, ОСЛОЖНЕНИЯ И РЕЗУЛЬТАТЫ ЛЕЧЕНИЯ

Мустафакулов Ишназар Бойназарович, Tokhirov Sheroz Mardonkulovich, Джураева Зилола Арамовна
Самаркандский Государственный Медицинский Университет и Термезский Филиал Ташкентского Государственного Медицинского Университета

Аннотация: Тактика «open abdomen» (открытый живот) применяется при наиболее тяжёлых формах распространённого перитонита, сопровождающихся абдоминальным сепсисом и синдромом внутрибрюшной гипертензии. Целью исследования явилась оценка показаний, частоты осложнений и клинической эффективности применения тактики open abdomen у больных с распространённым перитонитом. Установлено, что метод является обоснованным при строгом соблюдении показаний, однако сопровождается высокой частотой осложнений и требует индивидуализированного подхода и динамического мониторинга состояния пациента.

Ключевые слова: open abdomen, лапаростомия, распространённый перитонит, абдоминальный сепсис, внутрибрюшная гипертензия.

TARQALGAN PERITONITDA «OPEN ABDOMEN» TAKTIKASI: KO‘RSATMALAR, ASORATLAR VA DAVOLASH NATIJALARI

Mustafakulov Ishnazar Boynazarovich, Tohirov Sheroz Mardonkulovich. Djurayeva Zilola Aramovna
Samarqand davlat tibbiyot universiteti va Toshkent davlat tibbiyot universitetining Termiz filiali

Annotatsiya: «Open abdomen» (ochiq qorin) taktikasi abdominal sepsis va qorin ichki gipertenziyasi sindromi bilan kechuvchi tarqalgan peritonitning eng og‘ir shakllarida qo‘llaniladi. Tadqiqotning maqsadi tarqalgan peritonit bilan og‘rigan bemorlarda «open abdomen» taktikasini qo‘llashga ko‘rsatmalar, asoratlar chastotasi va klinik samaradorligini baholashdan iborat bo‘ldi. Aniqlandiki, ushbu usul ko‘rsatmalarga qat’iy rioya qilinganda asoslangan hisoblanadi, biroq u asoratlarning yuqori chastotasi bilan kuzatiladi hamda individual yondashuvni va bemor holatining dinamik monitoringini talab etadi.

Kalit so‘zlar: open abdomen, laparostomiya, tarqalgan peritonit, abdominal sepsis, qorin ichki gipertenziyasi.

INTRODUCTION

Severe disseminated peritonitis remains one of the main causes of abdominal sepsis, multiple organ failure syndrome, and high mortality. In recent decades, the "open abdomen" tactic, which involves temporarily leaving the abdominal cavity open for decompression, repeated debridement, and infection control, has become increasingly common in emergency abdominal surgery.

The growing interest in open abdomen surgery is driven by the need to prevent and treat intra-abdominal hypertension and abdominal compartment syndrome, which significantly worsen the prognosis in patients with widespread peritonitis. At the same time, this approach is associated with a number of serious complications, including intestinal fistulas, infectious complications, ventral hernias, and high mortality.

The lack of uniform criteria for selecting patients for the use of open abdomen leads to ambiguous treatment results, which determines the relevance of analyzing the indications and clinical effectiveness of this tactic.

To evaluate clinical indications, complication rates and treatment outcomes in patients with widespread peritonitis using the open abdomen tactic.

The open method – laparostomy, “open abdomen” – is used for extensive irreversible destructive changes in the abdominal cavity, intestinal fistulas, necrotic changes in the tissues of the anterior abdominal wall around the wound, the development of ACS, and severe pancreatitis.

Over the past two decades, there has been a significant increase in the use of open abdomen, accompanied by the emergence of a variety of techniques. However, the diversity of these methods leads to contradictory conclusions in scientific research. The frequency of complications can vary threefold or more depending on the open abdomen technique used.

Existing methods and devices for temporary closure of the abdominal cavity in open abdomen surgery can be classified as passive and active.

Passive methods of temporary closure of the anterior abdominal wall wound, such as the Bogota bag, the use of mesh material, polyvinyl bags (Borráez O.A.), or zipper devices, have a number of advantages: accessibility, ease of use, and low cost. However, a significant disadvantage of these options is their inability to completely remove intra-abdominal fluid, which can lead to serious complications and an increased risk of death.

Active treatment methods involve the use of negative pressure in the area of the closed wound. This approach promotes the approximation of its edges and more complete removal of exudate that may form or remain in the abdominal cavity (VAC laparostomy).

Some researchers prefer VAC laparostomy, considering it a more advanced method. The authors of the article believe that this approach to the treatment of PC allows for more rapid relief of the symptoms of peritonitis by reducing the number of cleanings and increasing the time between them.

In their work, Bleszynski and his colleagues reported a decrease in mortality in patients with pancreatic cancer (PC) and abdominal sepsis when using VAC laparostomy.

According to a study by M. A. Kossovich and his colleagues, the use of the VAC system effectively removes exudate from the abdominal cavity, making it possible to avoid drainage. In addition, this system improves microcirculation in the tissues of the anterior abdominal wall and

internal organs, reduces the likelihood of compartment syndrome, and lowers the risk of postoperative ventral hernias. Researchers believe that 12-24 hours after drainage tubes are placed in the abdominal cavity, they begin to separate from the free abdominal cavity, forming fibrinous partitions and resting on the walls of internal organs and the greater omentum. This phenomenon significantly reduces the effectiveness of peritoneal exudate drainage.

According to a study by G. L. Carslon and colleagues, no significant differences were found between active and passive methods of laparostomy formation in the frequency of complications observed in the early postoperative period.

In 2017, the World Society for Emergency Surgery (WSES) presented the International IROA Registry, which is based on data from a multicenter prospective study involving 369 patients who underwent laparostomy. The registry compares the effectiveness of various techniques, such as Barker vacuum packing, Bogota bag, VAC, and Wittmann dressing. The study analyzed patient demographics, timing of laparostomy, indications for its performance, as well as complications and mortality both before and after laparostomy closure. The registry data show that VAC laparostomy has the lowest mortality and complication rates, but it ranks first in terms of fistula formation frequency compared to the Wittmann dressing technique.

Foreign researchers note that open management of the abdominal cavity in RP has an advantage due to the ability to monitor and perform decompression in the event of ACS caused by peritoneal edema. This is because open surgery allows for the elimination of the pathological systemic consequences of ACS, reduction of inflammatory processes, and avoidance of excessive infusion therapy. The presence of significant visceral edema allows for staged interventions, which can delay or reduce the extent of the final surgical intervention. This is especially relevant in cases of hemodynamic instability in the patient, leading to serious tissue perfusion disorders, for example, when it is necessary to perform intra-abdominal anastomosis. However, clear criteria for the use of open abdomen tactics have not yet been established.

MATERIALS AND METHODS OF RESEARCH

The study included patients with severe forms of diffuse peritonitis who were treated at clinics of the Surkhandarya branch of the Russian Research Center for Emergency Medical Care. All patients were admitted on an emergency basis and required urgent surgical treatment.

The criteria for inclusion in the study were intraoperatively confirmed diffuse peritonitis, severe general condition of the patient, inability to perform simultaneous sanitation of the abdominal cavity, and signs of intra-abdominal hypertension or abdominal sepsis. Patients with localized forms of peritonitis and terminal stages of concomitant diseases were not included in the study.

All patients underwent a comprehensive clinical and laboratory examination with assessment of hemodynamic parameters, respiratory function, acid-base status, and renal function. The severity of the condition and the prognosis of the disease were assessed using the Mannheim Peritonitis Index (MPI), APACHE II, and SOFA scales.

Intra-abdominal pressure was monitored indirectly through the bladder using a standard technique. Measurements were taken preoperatively and postoperatively in a dynamic manner. Increased intra-abdominal pressure was considered one of the key risk factors for the development of abdominal compartment syndrome.

The “open abdomen” tactic was used when safe primary closure of the abdominal cavity was not possible, in cases of severe intestinal edema, unstable hemodynamics, signs of abdominal sepsis, and intra-abdominal hypertension. In the postoperative period, dynamic monitoring of the

patient's condition was carried out with an assessment of organ dysfunction indicators and the need for repeated sanitation.

The effectiveness of the open abdomen technique was assessed by the frequency of complications, mortality, duration of treatment, and the possibility of subsequent closure of the abdominal cavity.

RESEARCH RESULTS

The open abdomen approach was used due to the patients' extremely severe condition and high risk of developing abdominal compartment syndrome. Initial severity indicators indicated a poor prognosis.

Table 2. Treatment results depending on tactics

Indicator	Meaning
MPI, points	30.4 ± 2.6
APACHE II, points	22.8 ± 2.1
SOFA, points	10.9 ± 1.4
Intra-abdominal pressure, mmHg	22.6 ± 3.2

Most patients experienced a significant increase in intra-abdominal pressure, accompanied by respiratory and renal impairment. The use of an open abdomen allowed for abdominal decompression and hemodynamic stabilization in the early postoperative period.

At the same time, the complication rate remained high. The most common complications were surgical site infections, intestinal fistulas, and ventral hernia formation. Mortality in this group of patients was higher than in patients treated using closed and semi-open laparotomy techniques.

DISCUSSION

The open abdomen tactic is one of the most controversial methods of treating severe forms of diffuse peritonitis. On the one hand, its use allows effective control of intra-abdominal pressure, prevents the development of abdominal compartment syndrome, and provides access for repeated sanitation. On the other hand, the method is associated with a high frequency of complications and adverse long-term consequences.

The results of the study confirm that the main indication for the use of open abdomen is the extremely severe condition of the patient with signs of abdominal sepsis and pronounced intra-abdominal hypertension. In this category of patients, closure of the abdominal cavity under conditions of increased pressure can lead to deterioration of respiratory and renal function and progression of multiple organ failure.

One of the key advantages of the open abdomen tactic is the ability to dynamically monitor the condition of the abdominal cavity and perform repeated debridement without additional surgical trauma. This is especially important when it is impossible to eliminate all foci of infection at once and there is significant contamination of the abdominal cavity.

At the same time, the high frequency of complications identified in the study emphasizes the need for strict selection of patients for this tactic. The development of intestinal fistulas, infections in the area of surgical intervention, and ventral hernias significantly worsens the long-term results of treatment and the quality of life of patients.

Dynamic monitoring of intra-abdominal pressure and organ functions is of particular importance. Timely reduction of intra-abdominal pressure and stabilization of systemic parameters create the conditions for early closure of the abdominal cavity, which reduces the risk of

complications. In this regard, the open abdomen tactic should be considered a temporary measure aimed at stabilizing the patient's condition.

The data obtained confirm that the use of open abdomen should not be routine. The method is appropriate only with strict adherence to indications and within the framework of a differentiated treatment algorithm for widespread peritonitis. Rational use of this tactic improves the immediate results of treatment in severe forms of the disease.

CONCLUSION

The open abdomen approach is a valid treatment method for severe forms of disseminated peritonitis complicated by abdominal sepsis and intra-abdominal hypertension syndrome. While this approach stabilizes patients, it is associated with a high complication and mortality rate. The use of an open abdomen approach should be strictly selective and based on an objective assessment of the severity of the condition and dynamic clinical monitoring.

Bibliography

1. Litvin A.A. Scale for early detection and prediction of outcomes of abdominal sepsis / A.A. Litvin, I.Z. Weisbein, L.V. Savich et al. // Proceedings of the All-Russian Surgical Forum - 2019 in collaboration withXXII Congress of the Russian Society of Endoscopic Surgery (ROEKh named after Academician V.D. Fedorov). – Moscow, 2019. – P.346–346.
2. Litvin, A. A. ScalePIPAS for early prediction of abdominal sepsis / A. A. Litvin, E. N. Kolokoltseva, E. A. Litvina // Collection of materials of the VII All-Russian scientific and practical conference with international participation "Innovations in the health of the nation", St. Petersburg, November 7-8, 2019. - 2019. - P. 42-44.
3. Makarov I. V. Effectiveness of modern prognostic scales for assessing the severity of the condition of patients with acute severe pancreatitis. / I. V. Makarov, I. A. Mustafaev, A. V. Kurashev, L. A. Budorina, L. V. Gerasimov // Science and innovation in medicine. - 2020. - No. 5 (4) - P. 278-282.
4. Makarova, V. D. Comparative characteristics of urgent abdominal pathology complicated by purulent peritonitis in the period 2017-2019 using the example of the Kirov Regional State Budgetary Healthcare Institution “Kirov Emergency Hospital” / V. D. Makarova //Polish Journal of Science. – 2020. – No. 27. – P. 28-33.
5. Methodology for assessing the severity of widespread peritonitis and the likelihood of relaparotomy / B. V. Sigua, V. P. Zemlyanoy, S. V. Petrov [et al.] // Grekov Surgery Bulletin. - 2021. - Vol. 180, No. 2. - P. 21-27.
6. Mikhailichenko V.Yu. Clinical and diagnostic parallels of enteral insufficiency and endogenous intoxication in peritonitis / V.Yu. Mikhailichenko, S.A. Samarin, P.S. Trofimov // Medical Bulletin of the Ministry of Internal Affairs.2019:3(100):33-39.
7. Mikhailichenko V.Yu., Tatarczuk P.A., Kislyakov V.V., Reznicenko A.M., Butyrsky A.G., Kerimov E.Ya., Pilipchuk A.A., Samarin S.A. "Application of the method of programmed sanitation of the abdominal cavity in diffuse purulent peritonitis: clinical observation and review" Tavrichesky Medico-Biological Bulletin,vol. 25, no. 2, 2022, pp. 147-151.
8. Mikhailichenko, V.Yu. Clinical and diagnostic parallels of enteral insufficiency and endogenous intoxication in peritonitis / V.Yu. Mikhailichenko, S.A. Samarin, P.S. Trofimov // Medical Bulletin of the Ministry of Internal Affairs. - 2019. - T. S, No. 3. - P. 33-39.
9. Mikhelson, E.P. Diagnostic value of determining the level of procalcitonin in abdominal surgery / E.P. Mikhelson, S.A. Shlyapnikov, N.R. Nasser, I.M. Batyrshin, D.S. Sklizkov, Yu.S.

Ostroumova, V.G. Dvoinov, M.A. Borodin // Journal MediaAl. – 2019. – T. 23, No. 1. – P. 25-27.

10. Mrugova, T.M. Seroresistance and antibiotic resistance of strainsEscherichia coli isolated from patients with infectious and inflammatory diseases / T. M. Mrugova, V. A. Gritsenko, V. A. Ageevets // Problems of Medical Mycology. - 2020. - Vol. 22, No. 3. - P. 108.
11. On the problems of treating widespread purulent peritonitis / A. M. Karsanov, S. S. Maskin, A. A. Khasieva [et al.] // Modern science: current problems of theory and practice. Series: Natural and technical sciences. - 2020. - No. 8. - P. 168-172.
12. Ostroumova Yu.S. Scale systems for predicting the course and outcome of peritonitis and abdominal sepsis / Yu.S. Ostroumova, I.M. Batyrshin, N.R. Nasser, D.S. Sklizkov, E.P. Ryazanova, M.A. Borodina, S.A. Shlyapnikov // Bulletin of the DSEA. – 2019. - No. 4 (33). - S64-71.
13. Plotkin D.V., Reshetnikov M.N., Sinitsyn M.V., Zyuzya Yu.R. Disseminated peritonitis and splenitis caused by MAC infection in a patient with immunosuppression. Journal of Infectology. 2021;13(3):135-142. https://doi.org/10.22625/2072-6732-2021-13-3-135-142