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Current Status and Prospects of Enhanced Recovery after Surgery (ERAS)

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Abstract: ***Enhanced recovery after surgery (ERAS) is a multi-disciplinary and multi-model perioperative rehabilitation concept developed on evidence-based medicine, designed to reduce surgical stress, Promote faster and better recovery of patients, so as to achieve an ideal state of win-win for doctors and patients. The development of surgery is changing with each passing day, the development of more surgical methods, the breakthrough of more medical problems, the development of minimally invasive technology, the rise of robotics and remote surgery, the future of surgery contains unlimited potential and possibilities, aimed to achieve faster and better recovery of patients after surgical treatment. For this reason, we are tirelessly pursuing it, focusing on every detail of the patient's recovery process, and using ERAS to optimize perioperative treatment and care, so as to achieve the fastest and best recovery.***

Keywords: Enhanced recovery after surgery, Evidence-based medicine, fast-track surgery, Rehabilitation.

1. ERAS History

In 1997, Professor Kehlet from Denmark published a paper expounding that perioperative multimodal intervention can reduce surgical stress damage, reduce complications and treatment costs, and accelerate rehabilitation [1], and for the first time in the 1999 American Surgery Annual Conference report The concept of fast-track surgery (FTS)and was later gradually renamed as enhanced recovery after surgery(ERAS). ERAS is rapidly gaining the favor of more and more surgeons for its subversion of the traditional perioperative nursing care concept and its remarkable rehabilitation effect.

2. The meaning of ERAS

The essence of ERAS is a patient-centered multi-modal and multidisciplinary medical care model. Its purpose is to promote faster and better recovery of patients. The direct beneficiaries of the implementation of ERAS are the patients. Compared with the traditional perioperative care that has been inherited for many years Philosophy, ERAS adopts more scientific and standardized perioperative treatment, including: (1) preoperative education, cessation of smoking and alcohol, preoperative visits and evaluation, preoperative nutritional support treatment, targeted mechanical bowel preparation, promotion of prohibition drinking time is 2 hours before surgery, and the fasting time is postponed to 6 hours before surgery. It is recommended to take carbohydrate-containing drinks before surgery. (2) Prophylactic use of antibiotics during surgery, selection of appropriate anesthesia methods, and depth of anesthesia detection to maintain body fluid stability, body temperature management, appropriate use of minimally invasive techniques, reduce unnecessary nasogastric tube and drainage tube placement. (3) Postoperative multimodal analgesia, prevention and treatment of nausea and vomiting, early removal of the catheter, early eating and getting out of bed, reasonable discharge standards, etc.[5] These proven effective measures have reduced surgical stress and postoperative complications, accelerated patient recovery, shortened hospital stays, reduced medical costs and did not increase the readmission rate [6,7]. In addition to these objective results, ERAS also minimizes the pain and discomfort of patients during hospitalization and improves the quality of life of patients during hospitalization. Thiele et al. found that after the implementation of ERAS, the overall Preschini survey of patients，the score increased from the 29th percentile to the 59th percentile.

More patients reported being ready for discharge (increased from the 41st percentile to the 99th percentile), increased satisfaction with pain control (43rd percentile to 98th percentile) and the patient also said that the possibility of recommending the hospital to others is higher (32nd to 89th percentile) [8]. Patient-centered multidisciplinary collaboration, adequate education and communication, and ideal postoperative recovery conditions enable patients to learn more about their own situation during medical treatment, have a greater sense of trust in doctors, and a greater sense of participation in the entire treatment process and satisfaction.

From the perspective of medical workers, the successful implementation of ERAS requires the close collaboration and communication of a multidisciplinary team. Only when each member increases compliance with ERAS can we finally achieve a better rehabilitation result. Reducing postoperative complications, shortening the length of hospitalization, and realizing faster and better recovery of patients are the most direct manifestation of the value of the work of doctors, and it is also in line with the current pay-for-performance programs for medical staff.

The implementation of ERAS requires huge financial and human investment, and its sustainable development largely depends on its return on investment (ROI). More and more scholars are conducting cost-effectiveness analysis of ERAS from the level of "medico-economic". Although hospitals have different levels of medical consumption, the

overall conclusion is that ERAS has considerable economic benefits. , Including the cost of patients during the implementation process and the investment of the medical system to carry out ERAS, ERAS can reduce resource usage and capital expenditure compared with traditional perioperative treatment. In addition, patients can recover and return to their own society earlier functions to reduce the burden on caregivers and community health centers, thereby reducing the burden on the social medical security system [10, 11].

ERAS has positive significance for patients, medical workers and society as a whole, whether it is analyzed from the implementation effect or medical economics. From the perspective of the contradiction between the supply and demand of domestic medical resources and the uneven distribution, ERAS can promote rapid recovery of patients; speed up hospital turnover, and save social medical resources. These advantages have undoubtedly been adopted and recognized by the majority of colleagues. But it is undeniable that there are still some questionable issues in the implementation of the ERAS concept.

3. Issues worth noting during development

3.1 Evaluation obstacles and facilitating factors ERAS, as a surgical rehabilitation concept developed based on evidence-based medicine, has been developed for 20 years since it was proposed, and the literature reports, related guidelines and consensuses carried out in various hospital departments have also been developed. It tends to be perfect. Although there is a large amount of clinical evidence that ERAS has great advantages over traditional concepts in promoting patient recovery, it is regrettable that its development in practical work in the medical field is very slow [12]. There is a known-doing gap between practice and theory [13].

In order to promote the practical implementation of ERAS, it is far from enough to rely on various guidelines alone. We should focus on the problems and difficulties faced in actual operation and explore the obstacles and facilitating factors in its implementation. Nowadays, most researches on ERAS focus on their clinical effects, and there are relatively few literatures on the obstacles and facilitating factors in its implementation. After reviewing relevant literature, the author found that the key facilitating factors are: (1) Practical ERAS plans or guidelines; (2) Optimistic results can be achieved in the short term during the implementation process; (3) Supported by frontline clinicians and hospital leaders; (4) Subject leaders or plan implementation leaders; (6) Review and feedback.

The main obstacles are: (1) First-line doctors are limited by "traditional habits" and "safety considerations" and refuse to change the original perioperative strategy; (2) Insufficient implementation resources, including lack of human and financial resources in the hospital and out-of-hospital nursing resources; (3) Insufficient publicity and education for patients; (4) Insufficient communication and cooperation among multidisciplinary teams [14, 15，16].

In fact, these obstacles and facilitating factors can be transformed into each other. If the obstacles are handled properly, they will become the facilitating factors of ERAS. Only by solving these "stumbling blocks" in the implementation process we can steadily and sustainably realize ERAS from theory to practice transition. The author believes that each hospital should analyze the difficulties that may be encountered in the specific implementation process of the hospital according to its own local situation, and establish practical measures to overcome these difficulties. For example, medical workers should strengthen the learning of relevant knowledge to deepen the understanding of ERAS understanding and mastering, doctors are at the helm of the implementation of ERAS. Only when the majority of clinicians actively adopt and apply ERAS can help us bridge the gap between ERAS theory and practice; hospitals should form a multidisciplinary ERAS team, and ERAS develops better medical institutions for learning and observation; another example is to attach importance to patient education, including oral education and the distribution of brochures; another example is that hospitals and higher-level medical administration departments should support the development of ERAS and so on.

3.2 Pay attention to the review and feedback process. The implementation of ERAS is a complex process that requires the participation of multiple disciplines and the implementation of the entire perioperative period. In the actual clinical work outside the experimental environment, due to the limited medical resources or the patient's condition, the compliance with ERAS guidelines varies greatly during the practice process, which leads to ERAS unable to exert its maximum effect and unable to achieve an optimal clinical result. Multiple studies have shown that the higher compliance with ERAS, the fewer postoperative complications, the faster recovery of patients and shorter hospital stay [17, 18].

In order to improve the compliance of ERAS, it is necessary not only to strengthen the professional training of the medical team, but also to pay attention to audit and feedback [19]. Review and feedback are defined as the clinical performance of clinical work during a certain period of time. Summarize and evaluate, and then guide the clinical practice process [20].

Review and feedback can motivate participants to achieve phased goals and review the compliance with ERAS in the process of practice, thereby helping to improve the overall quality of ERAS implementation [20]. During the implementation of ERAS, a coordinator is required to assess the compliance of each ERAS step and the achievement of corresponding goals in real time, and provide timely feedback to the entire team to guide and adjust the next plan [18].

The review and feedback during the implementation of individual ERAS aims to guide and optimize individual treatment and care to accumulate experience for the next patient; the review and feedback of large-scale big data will be effective for the existing ERAS consensus. The test and scrutiny of rationality will guide the research and development of ERAS related guidelines and standards that keep pace with the times. Eventually, theories that can withstand the test of practice will become standards. The established standards will in turn regulate our practice. The above is a virtuous circle in which theory and practice promote each other, that is, the "Plan-Do-Study-Act" cycle [9].

At present, there are many large-scale databases established for the purpose of review and feedback around the world, such as the ERAS Interactive Audit System (ERAS Interactive Audit System, EIAS) established by the European ERAS Society. The system has been put into use in more than 20countries. Doctors from various countries can report relevant cases, enter the achievement of each step of ERAS during the implementation process, and fill in only 20-30 minutes/case; you can view the statistical report of the incidence of complications and average length of stay after the implementation of the ERAS process. Through review and feedback, we can not only obtain objective data on the difference between current practice and established goals, but also compare, think and improve on the similarities and differences between ourselves and other medical institutions in the implementation process and results of ERAS [22].

3.3 Grasping the essence and core problem has evolved from "fast-track surgery" to "enhanced recovery after surgery", emphasizing that the essence and core of this medical concept is to improve the quality of rehabilitation rather than speed, and blindly ignore the true recovery of patients,the pursuit of shortening the length of hospital stay is an act of sacrificing everything. At present, most of the development of ERAS is based on the length of hospitalization and the number of complications to evaluate the effect of ERAS implementation. However, discharge from the hospital does not mean rehabilitation. The real rehabilitation is to achieve a healthy state of physical, psychological and social functions.

Although ERAS has significantly shortened the length of hospital stay, what will happen to the patient after discharge? Have the discharge standards and discharge doctor's orders been fulfilled? Are there relevant community medical centers to support their follow-up recovery? Is the follow-up in place after discharge? There are few studies on these issues. The rehabilitation process starts from admission but not only to discharge. We should not only focus on the recovery of patients during hospitalization, but also the recovery of patients after discharge [23]. The currently accepted discharge standards include restoring a semi-liquid diet or oral supplementary nutritional preparations; no need for intravenous infusion therapy; oral analgesics can provide good pain relief; good wound healing without signs of infection; good organ function and free movement; patient consent to discharge, etc. [5]. In addition, after patients are discharged from the hospital, a complete follow-up system should be established and the patients can receive corresponding care in the community. This also depends on the continuous improvement and improvement of my country's three-level diagnosis and treatment system.

Most of the current research on the clinical effects of ERAS focuses on the length of hospitalization and the number of complications. However, there are few reports on patients' self-health perception, especially the recovery of patients after discharge from the hospital[24], Jai Bikhchandani[25] pointed out that patients PRO (patient-reported outcomes) can be used as a tool to evaluate the effectiveness of patients using ERAS in rehabilitation. It is a direct expression of the patient's perception of their own health status and is not affected by the doctor's subjective judgment, including the recovery of symptoms;functional recovery and overall health perception are evaluated in three aspects. It is recommended to evaluate patients on the first day after operation, at discharge, 30 days after discharge, and 90 days after discharge. However, due to the lack of comprehensive and easy-to-understand evaluation tools at present,and the actual implementation involves a large amount of work, the application of PROs needs to be further studied.

4. Conclusion

ERAS are now presenting a prosperous scene in Afghanistan, but development and problems coexist, gains and challenges coexist. Since the development of ERAS, the problem we face is no longer how to accept this new concept, but how to put it into the development of clinical work. We still have a long way to go to achieve the true popularization and promotion of ERAS. There are still many problems to be solved. We need more localized guidelines and consensus, more high-quality clinical research, and more the unremitting efforts and persistence of the first-line clinicians.

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