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ORIGINAL ARTICLE

Evaluate the compliance of perioperative practices of the patients with the enhanced recovery after surgery protocols

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Abstract

The Enhanced Recovery after Surgery (ERAS) protocol is a multimodal and evidence-based medical practice developed to define the concept of perioperative interventions to improve postoperative outcomes. The protocol consists of a number of elements implemented in the pre-, intra - and post-operative periods. This study aimed to evaluate the compliance of perioperative practices with the ERAS protocols in patients undergoing surgical intervention. In this descriptive and prospective study, 405 patients who underwent surgery in the General Surgery Clinic of a University Hospital created a sample of the study. In the study, where no intervention was made to the patients included in the study, the compliance of routine perioperative practices in the clinic offered to patients undergoing surgery to the protocol was evaluated using the questionnaire prepared in this direction. Procedures such as, in the preoperative period, providing verbal information to all the patients and giving antibiotic prophylaxis to 98.5% of the patients, in the intraoperative period, preferring the smallest possible surgical incision, and, in the postoperative period, using the paracetamol (99.5%) as the first choice for analgesia were compatible with the ERAS protocols. Procedures such as, in the preoperative period, not providing oral carbohydrate to any of the patients and keeping the fasting period longer period (10.91 ± 4.79 hours), in the intraoperative period, preferring anesthetic agents that are effective for a long time, and not perform the necessary practices to ensure normothermia in any of the patients, and, in the postoperative period, not starting the oral nutrition early and using urinary catheterization for 87.7% of the patients were not compatible with the ERAS protocols. As a result of the research, it was determined that the routine perioperative applications in the clinic did not sufficiently comply with the ERAS protocol.

Keywords: *Enhanced recovery after surgery, perioperative process*

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Introduction

The Enhanced Recovery after Surgery (ERAS) protocol is a multimodal and evidence-based medical practice developed to define the concept of perioperative interventions to improve postoperative outcomes [1]. The protocol consists of a number of elements implemented in the pre-, intra - and post-operative periods [2].

ERAS Protocol implemented since the 1990s provides benefits such as oral food intake facilitation and acceleration, minimizing the duration of hospital stay and reduction of complications, early mobilization, accelerating the return to daily activities after discharge [3]. A recently published meta-analysis study emphasizes that by applying ERAS protocols in major surgeries, the duration of hospital stay is shortened by 2-3 days and the incidence of complications is reduced by 30-50% [1].

ERAS protocols have begun to be discussed and widely used following the remarkable and promising results of studies conducted in many countries [4]. However, in a survey study conducted with a large number of surgeons from different centers during the transition of the protocol into practice, it was found that innovations, although based on evidence, were not easily accepted [5]. In another similar study, it was reported that the implementation of the ERAS protocol was perceived positively, while the most important factors that prevent the implementation were lack of manpower, poor communication and cooperation, and resilience to change [6]. The foundation of the ERAS Society Turkey in 2017 and the organization of the first ERAS Congress in Ankara in May 2018 are important indicators that the ERAS protocol is becoming increasingly common in Turkey [1]. However, according to studies conducted in Turkey, it seems that doctors and nurses' knowledge of the ERAS protocols and practices is limited at insufficient levels [7], and all the recommendations of ERAS are not implemented as a whole, and doctors and nurses find it difficult to implement it despite increasing awareness [8]. The study results with a high level of evidence report that ERAS protocols are in the best interest of the patient. But the results of the study, which examined the awareness, knowledge, and practices of health professionals for ERAS protocols, suggest the question of what level of adequacy of protocol implementation transfer is.

This study was conducted to evaluate the compliance of perioperative practices used on patients admitted in the General Surgery clinic with ERAS protocols.

Materials and Methods

Ethical considerations

In order to carry out the study, ethics committee approval was obtained from the Clinical Research Ethics Committee, Afyon Kocatepe University (approval number 2016/3-34), and written permission was obtained from the related institution and informed consent from the patients participating.

Type of the study

This study is a descriptive type of research planned to assess the compliance of perioperative applications of patients in surgical clinics with the ERAS protocol and its impact on patient outcomes. The research which was performed as a single-centered was conducted in the General Surgery Clinic of Afyon Kocatepe University Hospital between November 2016 and January 2017.

Participants

This descriptive and prospective study was conducted in the General Surgery Clinic of a university hospital located in the city of Afyonkarahisar between November 2016 and January 2017. The universe of the study consisted of 473 patients who were treated for surgery at the general surgery clinic at the time of the study. 17 patients who had emergency operations performed, 12 patients whose extubation was over 24 hours, 2 patients who were foreign nationals and could not be communicated, 9 patients who did not agree to participate in the study, and 28 patients whose data could not be obtained completely, were excluded from the study. The study was completed with a total of 405 patients who received perioperative patient care in the clinic, who were conscious and agreed to participate in the research (Figure 1).

Data Collection

"The Patient Information Form", "Patient Monitoring Form" and "ERAS Protocol Compliance Form" were used as data collection tools (Table 1).

Data analysis

Analysis of the study data was completed by using SPSS version 20.0 (Armonk, NY: IBM Corp) package program. Descriptive statistics of continuous variables were shown with mean, standard deviation, minimum and maximum values, while descriptive statistics of categorical variables were shown with frequency and percentage. The Skewness-Kurtosis values and Shapiro-Wilk test were used to assess whether the

data were normally distributed.

Results

The average age of the patients was 49.68 ± 15.50, 51.9% were women, 43.7% were high school graduates, and 51.1% were not working anywhere. A total of 70.6% of patients did not have any chronic disease, 30.9% have been smoking, and 56.3% never had previous surgery for any reason. A total of 33.3% of the patients included in the study had hepatopancreatobiliary, 14.1% had a hernia, 10.9% had stomach-esophagus, 10.9% had other, 9.4% had breast, 8.4% had rectum, 6.9% had intestine and 6.2% had colon surgery.

Distribution of which the patients' perioperative process compliance with ERAS protocol is presented in Table 2. When the ERAS protocol compliance of preoperative period was examined; all the patients were informed about their diseases, surgery and the process of the surgery during the preoperative stages, 37% of them had mechanical bowel cleansing, none of the patients were given carbohydrates orally, and applied premedication, 88.9% of them were not applied to thromboembolism prophylaxis, 98.5% of them had prophylactic antibiotics applied 30-45 min before, all patients were forced to fasting after midnight, and the average fasting period was found to be 10.91 ± 4.79 hours. During the intraoperative period, 44.4% of patients were used drain, 73.8% were administered antiemetic drugs, none of the patients had any application to provide normothermia (blankets, IV warm liquids, hot air systems, etc.), while long-acting anesthetics were preferred in 95.1% of patients, and the smallest possible incision was performed in all patients. In the postoperative period, 29.4% of patients had an NG catheter and 87.7% had

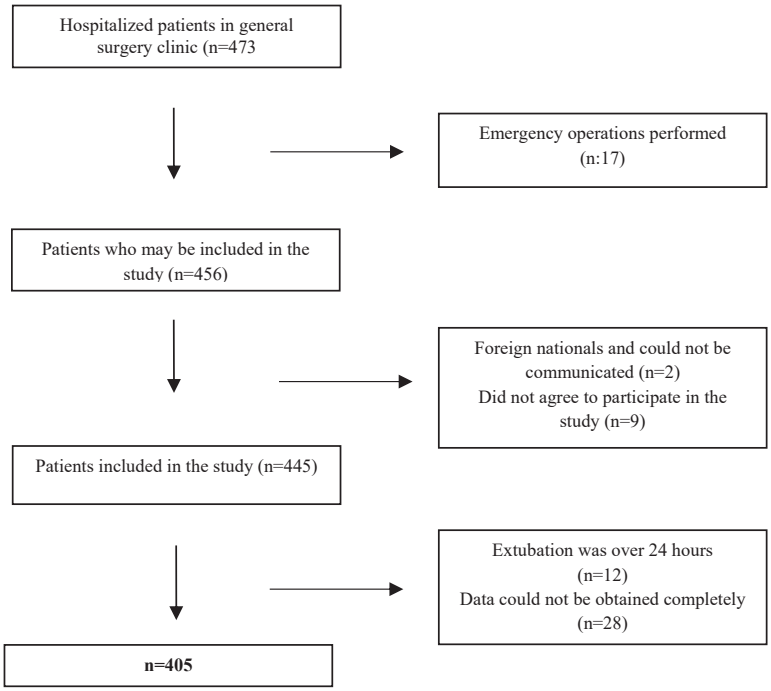

Figure 1. Study flow chart

Table 1. Data Collection Tools

Tools	Features
The Patient Information Form	10-item questionnaire prepared by the researchers after a review of the relevant literature
Patient Monitoring Form	Includes perioperative vital signs, surgical information (such as surgery entry/ exit time, intubation time, duration of surgery), hemogram-biochemistry - coagulation parameters, blood gas parameters, and Visual Analog Scale pain scale. Patients were asked to put a vertical mark on the 10 cm straight line. Other information was obtained from the patient file.
ERAS Protocol Compliance Form	Consists of 3 sections and 20 articles in which perioperative applications on which the ERAS protocol is based are evaluated. The information required to complete this form was obtained from the patients' files

Table 2. Perioperative processes and their distribution according to compliance with the ERAS protocols (n=405)

Period	Items		Yes		No	
			n	%	n	%
Preoperative Period	Preoperative information		405	100	-	-
	Preoperative mechanical intestine cleansing		150	37	355	63
	Preoperative oral carbohydrate intake		-	-	405	100
	Preoperative assessment of general situation		399	98.5	6	1.5
	Premedication		-	-	405	100
	Thromboembolic prophylaxis		45	11.1	366	88.9
	Prophylactic antibiotic use		399	98.5	6	1.5
	Fasting after midnight		405	100	-	-
	Solid foods 6 hours before surgery, liquid foods 2 hours before surgery		-	-	405	100
	Preoperative fasting time (hour) (Mean ± SD)		10.91 ± 4.79			
Intra-operative Period	Drain use		180	44.4	225	55.6
	Antiemetic use		299	73.8	106	26.2
	Maintaining normothermia		-	-	405	100
	Anesthesia procedure	Short-acting anesthetics	20	4.9		
		Long-acting anesthetics	385	95.1		
	Surgical incision	Transverse	-	-		
		Longitudinal	-	-		
		The smallest possible	405	100		
		Large enough to enable ease-of-work	-	-		
Postoperative Period	NG intubation		119	29.4	286	70.6
	Urinary catheterization		355	87.7	50	12.3
	Analgesics Administration	Epidural anesthesia + paracetamol	1	0.2		
		Paracetamol + narcotic	403	99.5		
		NSIA	1	0.2		
	Start to take liquid foods at 2. hour		-	-	405	100
	Start to take solid foods at 4. hour		-	-	405	100
	Mean duration before starting liquid food intake after surgery ((hour) Mean ± SD		9.38 ± 6.63			
	Mean duration before starting solid food intake after surgery (hour) (Mean ± SD)		15.06 ± 11.50			
	Mobilization time (hour) (Mean ± SD)		8.00 ± 2.46			
	Discharge (day) (Mean ± SD)		6.15 ± 4.51			

a urinary catheter inserted, 99.5% of patients had paracetamol and narcotic analgesics applied for pain control. While the liquid intake on the second hour and solid food on the fourth hour was not started for any of the patients. The mean time to start liquid foods was 9.38 ± 6.63 hours and the mean time to start solid foods was 15.06 ± 11.50 hours. Patients were mobilized after a mean of 8.00 ± 2.46 hours, and the mean discharge times were 6.15 ± 4.51 days.

Discussion

The ERAS protocol introduces important innovations that move beyond classical surgical and anesthesia practices and can be characterized as radical. These innovations, which suggest changes regarding the entire journey of a patient that starts before the surgery and ends at home, were used since the 1990s. They provide benefits such as facilitating and accelerating oral food intake, reducing hospital stay time and complications, providing early mobilization, and accelerating the return to daily life activities after discharge [2,3].

Having the patients to fast the night before surgery induces insulin resistance in the perioperative process negatively affects the nitrogen balance, and reduces the quality of life of patients [1]. In order to avoid these metabolic disadvantages in patients undergoing surgery, the European Society of Anesthesiology recommends that patients should stop taking solid foods 6 hours before surgery and liquid foods 2 hours before surgery [9]. Contrary to recommendations it is reported in the literature that patients still continue to be forced to fast for a longer time [10]. It is recommended that the patients should be given

800 ml of carbohydrate drinks until midnight before surgery and 400 ml 2-3 hours before surgery [1]. In studies, patients whose fasting period was shortened by carbohydrate-containing liquids had better insulin and inflammatory parameters, fewer indicators of malnutrition (handgrip strength, etc.), and shorter hospitalization period [11,12]. It was observed in this study that all the patients were made to fast after midnight, none of the patients were given oral carbohydrates therefore the protocol recommended by ERAS was not followed at all. In this study, it was found that the mean fasting time of patients was 10.91±4.79 hours (solid and liquid food intake was stopped at the same time). This may be related to two factors: the patients being inadequately informed by the healthcare professionals, who evaluated the patient last, about how to fast and the duration of fasting in accordance with the protocols, and the socio-cultural levels of the community where the study carried out.

The purpose of premedication is to reduce the stress response and anxiety caused by surgery. In recent studies, there have been no evidence-based results that premedication reduces anxiety [13]. Therefore, unnecessary premedication should be avoided [1]. In this study, it was found that none of the patients undergoing surgery were applied premedication (anxiolytic or sedative agent) during the preoperative period, which shows compliance with ERAS protocols.

It has been recommended that thromboembolic therapy be initiated in the preoperative period [1] and that prophylaxis is continued after discharge in order to reduce/eliminate the risk of deep vein thrombosis and pulmonary embolism, which causes serious complications in the postoperative period [14]. In this study, 11.1% of the patients were detected to be given antithromboembolic medications in the preoperative period.

Antibiotic prophylaxis is recommended in the preoperative period to prevent and reduce wound site/surgical area infections that may develop in the Post-operative period [15]. In this study, antibiotic prophylaxis was given to 98.5% of the patients, who underwent surgery, in the preoperative period. Third-generation cephalosporin antibiotics, administered 30-45 min before surgical incision, were preferred for antibiotic prophylaxis. In studies examining this issue, it has been reported that the rate of infection development at the surgical site was lower and the duration of hospital stay was shorter in patients undergoing antibiotic prophylaxis [16].

Although there is no definite recommendation about the shape of the incisions in the ERAS protocols, it is reported that the smallest possible incision should be used [1]. In a systematic review investigating the effects of incisions in abdominal surgery on patients, it was reported that the need for narcotic analgesics was lower in patients with transverse incisions while the deterioration of pulmonary function was high in patients with longitudinal incisions [17]. In this study, it was determined that there was no standard choice of incision, therefore the incisions were made according to the surgical interventions, and the smallest possible incisions were made.

Maintaining preoperative normothermia is quite important. Warming the patients during the perioperative period has been reported to be effective in reducing postoperative pain, wound infection, and tremor [18]. In this study, it was detected that the methods for maintaining normothermia were not applied to the patients (blanket, IV fluid, heater, etc.). In the intraoperative period, the mean body temperature of the patients was 35.42±0.33 °c (n=38), while 36.03±0.20 °C in the postoperative period.

Drains placed in the intraoperative period are traditionally used to ensure postoperative fluid accumulation and drainage of fluid that will occur with a possible anastomosis leakage. But drain creates a physical barrier in the patient, can prevent the mobilization of the patient, and makes pain control difficult [7]. It has also been shown that the use of drains has no effect on anastomosis leakage [19]. For this reason, routine use of drains should be avoided, if it is used, the drains used should be removed as soon as possible [1]. In this study, 44.4% of patients had drains placed in during the intraoperative period.

In this study, it was determined that the rate of patients who had a nasogastric catheter (NG) was 29.4% and that the NG catheter was removed after an average of 2.30 ± 1.79 days in the postoperative period. In patients undergoing colon surgery, it was reported that with the use of ERAS protocols, the patients used NG decreased from 88.3% to 9.6% and the NG removal time was 2.5 days on average [20]. These results show similarities to our study.

The ERAS protocol argues that liquid food on the 2nd hour and solid food intake on the 4th hour of the post-operative period should be encouraged for the patients [1]. Studies conducted in different countries indicate that the earlier oral feeding starts for the patients the shorter the time of the first defecation and the duration of hospital stay is [21,22], not the presence of anastomosis leakage and abscess and the patient

satisfaction was high [23]. In laparoscopic colorectal resection surgery, in addition to preoperative oral carbohydrate administration in accordance with ERAs recommendations, patients, who switched to post-operative oral nutrition early had faster recovery of their postoperative clinical functions, decrease in recovery time and decrease in-hospital stay [24]. In this study, none of the patients have been begun the liquid food on the 2nd hour and solid food intake on the 4th hour of the post-operative period. It was determined that the mean start time of liquid food intake was 9.38±6.63 hours, and the mean start time of solid food intake was 15.06±11.50 hours.

Early mobilization of patients is recommended in the postoperative period [1]. Pain control should also be provided for adequate mobilization [25]. It was detected in studies examining the relationship between the postoperative mobilization and pulmonary complications that patients not mobilized early enough had a higher incidence rate of pulmonary complications, patients with pulmonary complications had extended hospital stay [26], and 58% of the patients were managed to be mobilized later [27]. In this study, the mean mobilization time of the postoperative period was determined to be 8.00±2.46 hours.

Conclusion

Findings obtained from this study examining how much ERAS protocols, which include evidence-based applications, reflect on the clinic show that, none of the patients were given oral carbohydrates and the fasting was kept for a long time. It also indicated that necessary applications were not used to maintain the normothermia for the patients, early oral feeding not started, drains and urinary catheterization was still being used at high percentages. This study offers important results in that it shows that the compliance of routine clinical perioperative practices with the ERAS protocol is not sufficient. The rate of compliance could be increased by raising healthcare professionals' awareness by providing them with better training on the ERAS protocols, supporting their participation in the training, and providing individualized ERAS-compliant care from the point of admission till discharge to patients undergoing surgical operations which use a multi-disciplines.

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Conflict of interest

There are no conflicts of interest for the authorship and/or publication of this article.

References

1. ERAS Turkey Association (ETA) (2018). ERAS protokollerinin temel ogeleri. (in Turkish) http://eras.org.tr/page.php?id=10&saglikCalisani=true.
2. Ljungqvist O, Hubner M. Enhanced recovery after surgery ERAS principles, practice and feasibility in the elderly. Aging Clin Exp Res. 2018;30(3):249-52. doi: 10.1007/s40520-018-0905-1.
3. Bozkirli BO, Gundogdu RH, Ersoy PE, Akbaba S, Temel H, Sayın T. Did the ERAS protocol affect our results in colorectal surgery? Turk J Surg. 2012;28(3):149-52. doi: 10.5152/UCD.2012.05.
4. Ersoy E, Gundogdu H. Enhanced recovery after surgery. Turk J Surg. 2007;23(1):35-40.
5. Lassen K, Hanneman P, Ljungqvist O. Pat¬terns in current perioperative practice: Survey of colorectal surgeons in five northern European countries. BMJ. 2005;330:1420-1. doi: 10.1136/bmj.38478.568067.AE.
6. Pearsall EA, Meghji Z, Pitzul KB, Aarts MA, Mckenzie M, Mcleod RS, et al. A qualitative study to understand the barriers and enablers in implementing an enhanced recovery after surgery program. Ann Surg. 2015;261(1):92-6. doi: 10.1097/SLA.0000000000000604.
7. Harlak A, Gundogdu H, Ersoy E, Erkek B. Attitude of surgeons in Ankara about enhanced recovery after surgery (ERAS) protocol. Turk J Surg. 2008;24(4):182-8.
8. Kirik MS. Kolorektal ameliyatlarda klinik alanda ameliyat öncesi, sırası ve sonrası uygulamaların ERAS protokolüne uygunluğunun karşılaştırılması [master's thesis].(in Turkish) Gaziantep: Sanko University, Health Sciences Enstitute; 2018.
9. American Society of Anesthesiologists (ASA). Practice guidelines for preoperative fasting and the use of pharmacologic agents to reduce the risk of pulmonary aspiration: Application to healthy patients undergoing elective procedures: An updated report by the American Society of Anesthesiologists Task Force on preoperative fasting and the use of pharmacologic agents to reduce the risk of pulmonary aspiration. Anesthesiology. 2017;126(3):376-93. doi: 10.1097/ALN.0000000000001452.
10. Hooper VD. SAMBA consensus guidelines for the management of postoperative nausea and vomiting: An executive summary for perianesthesia nurses. J Perianesth Nurs. 2015;30(5):377-82. doi: 10.1016/j.jopan.2015.08.009.
11. Amer MA, Smith MD, Herbison GP, Plank LD, Mccall JL. Network meta-analysis of the effect of preoperative carbohydrate loading on recovery after elective surgery. Br J Surg. 2017;104(3):87-197. doi: 10.1002/bjs.10408.
12. Campos SBG, Barros-Neto JA, Guedes GDS, Moura FA. Preoperative fasting: Why abbreviate? Arq Bras Cir Dig. 2018;31(2):1377. doi: /10.1590/0102-672020180001e1377.
13. Horosz B, Nawrocka K, Malec-Milewska M. Anaesthetic perioperative management according to the ERAS protocol.

Anaesthesiol Intensive Ther. 2016;48(1):49-54. doi: 10.5603/AIT.2016.0006.

14. Miller MT, Rovito PF. An approach to venous thromboembolism prophylaxis in laparoscopic Roux-en-Y gastric bypass surgery. Obes Surg. 2004;14(6):731-7. doi: 10.1381/0960892041590944.
15. Bratzler DW, Dellinger EP, Olsen KM, Perl TM, Auwaerter PG, Bolon MK, et al. Clinical practice guidelines for antimicrobial prophylaxis in surgery. Am J Health Syst Pharm. 2013;70(3):195-283. doi: 10.2146/ajhp120568.
16. Perez-Blanco V, Garcia-Olmo D, Maseda-Garrido E, Najera-Santos MC, Garcia-Caballero J. Evaluation of a preventive surgical site infection bundle in colorectal surgery. Cir Esp. 2015;93(4):222-8. doi: 10.1016/j.ciresp.2014.12.003.
17. Bickenbach KA, Karanicolas PJ, Ammori JB, Jayaraman S, Winter JM, Fields RC, et al. Up and down or side to side? A systematic review and meta-analysis examining the impact of incision on outcomes after abdominal surgery. Am J Surg. 2013; 206(3):400-9. doi: 10.1016/j.amjsurg.2012.11.008.
18. Sajid MS, Shakir AJ, Khatri K, Baig MK. The role of perioperative warming in surgery: A systematic review. Sao Paulo Med J. 2009;127(4):231-7. doi: 10.1590/s1516-31802009000400009.
19. Zhang HY, Zhao CL, Xie J, Ye YW, Sun JF, Ding ZH, et al. To drain or not to drain in colorectal anastomosis: A meta-analysis. Int J Colorectal Dis. 2016;31(5):951-60. doi: 10.1007/s00384-016-2509-6.
20. Jottard K, Hoff C, Maessen J, Ramshorst B, Van Berlo CLH, Van Logeman F, et al. Life and death of the nasogastric tube in elective colonic surgery in the Netherlands. Clin Nutr. 2009; 28(1):26-8. doi: 10.1016/j.clnu.2008.09.002.
21. Li B, Liu HY, Guo SH, Sun P, Gong FM, Jia BQ. Impact of early postoperative enteral nutrition on clinical outcomes in patients with gastric cancer. Genet Mol Res. 2015;14(2):7136-41. doi: 10.4238/2015.June.29.7.
22. Sun DL, Li WM, Li SM, Cen YY, Xu QW, Li YJ. et al. Comparison of multi-modal early oral nutrition for the tolerance of oral nutrition with conventional care after major abdominal surgery: A prospective, randomized, single-blind trial. Nutr J. 2017;16(1):11. doi: 10.1186/s12937-017-0228-7.
23. Nematihonar B, Salimi S, Noorian V, Samsami M. Early versus delayed (traditional) postoperative oral feeding in patients undergoing colorectal anastomosis. Adv Biomed Res. 2018;16(7):30. doi: 10.4103/abr.abr_290_16.
24. Kim JY, Wie GA, Cho YA, Kim SY, Sohn DK, Kim SK, et al. Diet modification based on the enhanced recovery after surgery program (ERAS) in patients undergoing laparoscopic colorectal resection. Clin Nutr Res. 2018;7(4):297-302. doi:10.7762/cnr.2018.7.4.297.
25. Akin ML. Kolorektal Kanserlerde "Fast Track" Cerrahi. Baykan A, Zorluoglu A, Gecim E, Terzi C, Editors. Kolon ve Rektum Kanserleri. Secil Ofset Matbaacilik ve Sanayi (in Turkish); 2010. Sayfa 733-58.
26. Haines KJ, Skinner EH, Berney S. Association of postoperative pulmonary complications with delayed mobilisation following major abdominal surgery: An observational cohort study. Physiotherapy. 2013;99(2):119-25. doi: 10.1016/j.physio.2012.05.013.
27. Grass F, Pache B, Martin D, Addor V, Hahnloser D, Demartines N, et al. Feasibility of early postoperative mobilisation after colorectal surgery: A retrospective cohort study. Int J Surg. 2018;56:161-6. doi: 10.1016/j.ijsu.2018.06.024.