DOI: 10.4274/tjcd.87094
Turk J Colorectal Dis 2018;28:48-53

REVIEW

Decision Making in Surgical Oncology

Cerrahi Onkolojide Karar Verme

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ABSTRACT

As can be seen from ancient Egyptian writings, cancer has been a major health problem for at least 3.500 years. Significant progress has been achieved in the battle against cancer in conjunction with increased knowledge and technological developments. However, cancer remains one of the leading causes of deaths worldwide. In the last century, as genetics and histopathological studies have fostered our understanding of the nature of the disease, oncology has become a subdiscipline within some of the major medical branches, i.e. surgical oncology. Several studies have been conducted on the decision-making process in cancer patients and it has been emphasized that correct decision-making is essential for proper management of the disease. In this article, we aimed to create a foundation based on what we already know on this important issue, to understand the difficulties of the decision-making process, and to emphasize the developments needed to overcome these difficulties.

Keywords: Decision-making, surgery, decision support systems

ÖZ

Eski Mısır yazmalarından anlaşıldığı üzere kanser en azından 3,500 yıldır önemli bir sağlık sorunudur. Artan bilgi birikimi ve teknolojik yeniliklerle birlikte kansere karşı yapılan mücadelede önemli başarılar elde edilmiştir. Ancak kanser tüm dünyada ölümlerin hala önde gelen nedenlerindendir. Son yüzyılda genetik ve histopatolojik çalışmalarla hastalığın doğası daha iyi anlaşılırken, onkoloji kimi anabilim dallarında cerrahi onkoloji örneğinde olduğu gibi bir bilim dalı olmuştur. Kanser hastalarında karar verme süreci üzerinde çeşitli çalışmalar yapılmış doğru karar vermenin hastalığın iyi yönetimi için gerekli olduğu üzerinde durulmuştur. Bu makalede amacımız bilinenlerden hareketle bu önemli konuda ilave çalışmaların yapılması için zemin oluşturmak, karar alma sürecinin zorluklarını anlama ve bunları aşma konusunda kat edilmesi gereken bir yolun varlığına vurgu yapmaktır.

Anahtar Kelimeler: Karar verme, cerrahi, karar destek sistemleri

Introduction

Deciding about cancer, especially about cancer treatment, may seem like a simple matter. It may be reasonable to choose the treatment that prolongs the life most or the one that maximizes the quality of life if there is no difference between the treatments in terms of life expectancy. However, studies show that decision-making in oncology is not as simple as it seems. The whole process should be managed properly. Prevention, screening, diagnosis, treatment, survival, and the last stage of life are the stages in this process, which are difficult to decide upon.[1] One out of every 150 hospitalized patients is lost due to complications; 40% of the complications are seen in surgical patients and half of the surgical complications are preventable.[2,3] The decision-making process must be well managed to minimize these complications and other undesirable consequences. The process consists of sequential decisions (Figure 1). Fox et al.[4] identified approximately 65 separate decision-points in diagnosis, screening, treatment, and follow-up periods during the health care of patients with breast cancer. This demonstrates the complex structure of the decision process in surgical oncology. At each decision point, if the process does not ideally progress, the cost of the marginal errors can finally become dramatic. On the one hand observation of oncological principles and development of patient-specific treatments have increased the survival rates, but on the other hand, the difficulties in decision-making become more frequent. Beyond that, there are always complicated situations where it is necessary to make the right decision to maximize the benefit of the patient from the treatment.[5]

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Received/Geliş Tarihi: 26.12.2017 **Accepted/Kabul Tarihi:** 22.01.2018

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Turkish Journal of Colorectal Disease published by Galenos Publishing House.

One of the aspects of surgical oncology that distinguishes it from other disciplines dealing with the treatment of serious diseases is that both the physician and the patient know that the cancer is often fatal. The possibility of the patient's death can affect the clinician, leading to the most controversial medical, surgical, technical and ethical debates in cancer management and decision making. Moreover, the definition of the patient's benefit can show individual differences in medical and surgical oncology. It is important for the patient at what cost the benefit of the surgery is obtained, which is related to cost, pain, risk, sequelae, and duration of possible physical impairment that may occur, the preferred lifestyle, the requirements of mindfulness, and the quality of life remaining. As a matter of fact, one out of three elderly patients are operated within the last year of their life, most of them in the last month.[6] Surgery has a risk of damage. The term "primum nil nocere", which means "first do no harm", is often used when discussing medical interventions with a low chance of benefit. In fact, it contains a paradox. Because surgery damages at first then heals. Surgery has its own risks and complications; it disrupts body integrity and is highly invasive. It's a field prone to human error. The surgeon sometimes has to decide in uncertain conditions.[7] Many physicians have not received adequate training on uncertainties, and the reactions shown in such cases may have negative clinical consequences.[8,9,10] Accordingly, medicine can be seen as a decision-making art without sufficient knowledge.[11] On the other hand, the patient-physician relationship is based on trust and this relationship can not be reduced to a contract. As implied by Gregory and McCullough[12] in 18th century, the physician must know exactly what is beneficial for the patient and keep the patient's interests above his or her own interests. While the decisions about how a patient is treated are related to the science, those about who should be treated are related to the ethical and moral values. The surgeon's decision-making skill has some grounds. The surgeon will be more advantageous in determining surgical strategy if more data is available. Theoretical and practical knowledge is valuable.



Figure 1. Care pathway for patients with breast cancer

The surgeon's anticipation and experience with similar situations are important. In this sense, decision-making is a judgment made in the light of knowledge, experiences, and evaluations.[12]

Decision Making Process

As in many areas of medicine, decisions are often taken in uncertain situations in surgical oncology. These decisions, which are taken independently of the severity, urgency, and necessity of the disease, have certain characteristics. Despite varying degrees of uncertainty regarding the medical condition of the patient, decisions are made in accordance with well-defined, reasonable preferences. An example of this is the decision on making surgery without a histopathological diagnosis in a patient with a tumor of the pancreatic head. The outcome of this decision is uncertain. For example, will the patient live? Is pain reduction worth the risk of surgical mortality? Decisions must be made although all these points have their own unknowns. In fact, the postponement of the decision or the preservation of the present situation is a judgment that also has consequences.[13] The surgeon takes into account the patient's preferences and directives, even if the decisions of the surgeon in unpredictable situations are likely to be accepted by the patient in advance. As a matter of fact, an unexpected finding can be reached during surgery or an iatrogenic injury can occur. Inadequacies can restrict existing alternatives. For example, a synchronous tumor may be missed in a patient operated urgently for ileus symptoms due to a sigmoid colon tumor. Surgical oncology has different decision moments. Alternative treatment options such as follow-up, medical treatment, less invasive surgical options or percutaneous techniques should be presented to the patient in the preoperative period.[2] When the surgical plan is discussed, it should be decided whether the surgery will be elective or urgent. For example, gastrointestinal bleeding findings in a patient with gastric cancer. It is not possible for a patient to participate in the decision process under general anesthesia during surgery. The surgeon must make the best decision for the benefit of the patient by taking into account the existing guidelines, recommendations, and expectations. However, unexpected situations or intraoperative findings may not be discussed in depth with the patient or his/her relatives. In addition to the postoperative need for early diagnosis and management of complications, the necessity of extraordinary methodologies should be considered. In cases where death is unavoidable, some practices with uncertain benefits may cause difficulties in decision-making.[14] The correctness of the decision in surgical oncology is provided by the integration of experience and anticipation in the light of current evidence on the subject. These features

are essential when obtaining information and applying this information to clinical problems. The components of knowledge are complex and require anticipation and judgment. According to Marshall[15], evidence, intuition, experience, anticipation and obedience lie in the foundation of knowledge. The logical understanding that goes from piece to whole lies on the basis of the evidence-based surgery. This understanding, which was first described by the clergy and mathematician Thomas Bayes, is based on the application of the initiative, observation, and probability principles. The strongest evidence obtained with this logic is randomized controlled studies. On the other hand, the results of 1/6 of the important randomized controlled trials published in the early 1990s were found to be contradictory in the subsequent studies, whereas it was seen that the effect size of the other 1/6 was exaggerated.[16] On the contrary, the lack of evidence from randomized controlled trials does not invalidate supportable results. Indeed, there is no such evidence for parachutes, and even the most ardent supporters of evidence-based medicine are unlikely to jump from a plane without a parachute.[17] On the other hand, the deduction is the most frequently used tool to make personalized decisions with the understanding that diseases do not manifest uniformly in all patients. Because the surgeon rarely has enough data from randomized controlled trials when taking difficult medical decisions. Even with data, the surgeon has to adapt the results to patient's special conditions, which is especially true in surgical oncology. Another instrument used by the surgeon to make decisions is the professional experience. The level of experience mediates decisions in some areas. The available information is synthesized and integrated with the specific constraints, values, and skills of the surgeon. Experience is a mechanism used to adapt treatment approaches to the needs and values of each patient. Foresight, one of the hallmarks of senior surgeons, is actually a forward projection of previous knowledge, experience, and comprehension skills. The characterization of the expert opinion is expressed as a quick pattern recognition and complex commands. Obedience is the non-critical adoption of the suggestions of the teachers and predecessors. There are different approaches to decision making in surgical oncology. Although the paternal model has often been criticized, it often describes the relationship between the surgical oncologist and the patient. This model usually puts the patient in a passive and dependent position in front of a surgeon who is the expert in the field. The knowledge provided by healthcare professionals is the basis for informed decision making. In this model, it is assumed that an informed patient is in a better position for decision making. However, this is often not the case in the cancer treatment process. This model reduces the surgical oncologist to an information provider by restricting his role in the decision-making process. Besides, often the patient is harmed even if he is legally competent and can not make the right decision about his health; and the asymmetrical structure of the knowledge is one of the biggest disadvantages. The model, in which the professionals are considered proxies, assume that the patient-physician relationship is based on trust and takes into account that the physician will give the best decision for patient's health and well-being. The co-decision process model considers the patient's preferences, needs, and values. In all clinical decisions, the values of the patient are guaranteed. This definition emphasizes the importance of the surgical oncologist and the patient acting jointly to achieve the best possible result.[18] Indeed, there are investigations that indicated that the level of patient involvement in the decision making process is related to a reduction in patient's regret.[19,20,21,22,23,24,25]

Indeed, the patient-surgeon relationship is based on trust but should not be seen as a contract. As Gregory and McCullough[26] expresses, the physician must understand patient's concerns. Maintaining and protecting the benefit of the patient should be the first priority of the physician and surgeon's interest should be in the second place.[26] The notion that the surgeon is patient's proxy is applicable in the following situations. In a patient-surgeon relationship and also in surgical training and research, protecting and maintaining the patient's interest should be the primary concern of surgical oncologist. These primary concerns hold the surgeon's personal concerns behind and bring them into the second place in a systematic view. Individual concerns are restricted and not allowed to cause evils from the selfishness of the surgeon's professional character. The patient-surgeon relationship is placed on a legal and ethical ground with the informed consent and perfected. The sufficient and willful attitude of the patient is a prerequisite to obtaining consent. The patient should understand the surgeon's explanation and the recommendations presented to him. The patient's attitude towards acceptance or rejection in the decision-making process, the manner in which it is expressed, the enrollment and the authorization procedures of the patient are the next steps. The surgical oncologist should not present the patient with a spectrum of surgical options by no means and should not be forced to contradict the standards of knowledge, belief, and care as long as there are no generally accepted practices. Decisions in surgical oncology are made more frequently with a multidisciplinary approach, which is one of the decision-making models. As a matter of fact, when the data are re-examined with a multidisciplinary approach, it is stated that decisions are changed by 22-42%.[27,28,29] The decision-making process, however, is not firmly established and is

often not aware of the patient's preferences, lifestyle, and choices. Consequently, decisions related to treatment, although scientifically excellent, do not benefit the patient.[30] This is especially true for oncology patients and the prevalence of regret is higher in studies on oncology patients. As a matter of fact, in the review of 73 studies evaluating regret primarily (57.5%) in oncologic patients, the average prevalence of patient regret was found to be 14.4% even though it varied among studies.[31] Health care is a process and there are many decision points in this process. Evaluating the treatment options, making recommendations, and expressing the benefits and risks require more than a knowledgeable and experienced surgeon. What is needed is a team including doctors, nurses and even physiotherapists and social workers. This makes the decision-making chain complex. Multidisciplinary decisions taken in surgical oncology can be configured using "system approach". Here, in the input-process-output model of team performance, the components have both technical and non-technical characteristics. This model, applied in the aviation industry, has been extensively investigated in studies on teamwork. Information, equipment, the participation of team members, expert opinion as an element of multidisciplinary meetings, information processing, free discussion, leadership, teamwork ethics constitute the process. The outputs include documentation and application of the decision, as well as consensus decisions, communication with the patient and the general practitioner.[1,32] Error rates can be reduced using well-designed error reduction systems based on system theory. System theory indicates that events, objects, places, and methods do not exist independently, but are intertwined as interdependent components of complex systems.[33,34,35] Nowadays, the transition from the "wise person" to the understanding of multidisciplinary team is obvious in medical decision making. Our horizons changed from local and narrow visions to regional, national and international spheres. Several methods, such as the Delphi method or its modifications used beyond the simple questionnaire-based studies in carrying the knowledge from expert opinion to consensus decisions, have been developed for structural communication and are generally used for future predictions.[36] Two examples of the Delphi method includes the international conference on "Multidisciplinary Rectal Cancer Treatment: Looking for a European Consensus" and the panel of Canadian Hepato-Pancreatico-Biliary Society on hepatic resection in metastatic colorectal cancers.[37,38] There are also moments when decisions are made individually, as in the case of a decision in the operating rooms. The decision-making process in the operating room is a critical, cognitive, necessary, and obligatory non-technical skill. The surgical oncologist will face difficult decision-making processes in the operating room and should be ready to make the best decision for patient's benefit.[39] Procedures in surgical oncology are characterized by time pressure, change of purpose, increased risk, high level of uncertainty, inadequate data availability, unexpected conditions and problems.[40] If surgery is performed without a serious complication, taking an action that can change the development of events does not make sense. But when faced with a sudden and unexpected situation (bleeding, unexpected findings, increased risk, accidents, difficulties, etc.), the surgeon will be forced to change the course of action. The first step is to be aware of the changes in the managed conditions, and this awareness is closely related to the cognitive follow-up of the steps in the surgical procedure. The second step after the detection of a problem by the surgeon in the course of the events is the identification of the problem, risk assessment, the assessment of the situation considering time constraints. Decision making strategy can adopt one or more mechanisms in a time frame: intuitive, rule-based, analytical, or creative. The goal is to solve the problem as soon as possible with minimal harm to the patient.

Ethical Tools in Surgical Decision Making

The surgical oncologist should use tools that address clinical difficulties and contribute to the decision making process in the management of these events and form a framework for ethical analysis. McCullough et al.[41] suggests a four-step approach in this regard. In the first step, the facts of the case are defined. The first condition for reasonable ethical analysis based on sound reasoning is the provision of all the data and facts of the identified clinical case as well as all treatment alternatives. It is appropriate to be aware of patient's facts and preferences. The second step is ethical analysis. Elements that should be considered in the ethical analysis are trust, equity, respect for autonomy, philanthropy principles. The third step is the ethical debate. This discussion answers the following questions: Are the reasons clearly expressed? Are there other reasonable options for the case? In the fourth step, power and authority issues are remarkable. The surgeon is an authority in terms of knowledge, education, and expertise. At the same time, the patient is the decision-maker on what will be done to his body.

In this sense, empathy, compassion, loyalty, honesty, usefulness, non-harm, autonomy and fairness are ethical principles related to clinical medicine.[42] Jonsen et al.[42] proposed a model with 4 headings, also known as "4 boxes", which can be applied to oncology patients to solve problems in clinical care. This shows the mutual interaction between ethical principles and concrete clinical situations.

This model refers to diagnostic and therapeutic options for solving problems at the point of medical indications and reflects useful and non-harmful principles. It expresses the choice of the patient in terms of the patient's preferences and refers to the prestige of the autonomy. Harmlessness and respect to autonomy principles are taken into account as the quality of life before and after medical and surgical interventions. Finally, in this model, the conditions and sources of each specific case are defined with a reference to justice and correctness. The question "What would you do if you were in my place?" is frequently heard in oncology clinics. This question symbols the desire to get the best in the form of an expert suggestion. It is important here that recommendations given as decisions are always given in the context of personal values that are not similar to those of the patient.[43] The decisions that have to be made in these and similar situations are as much of a medical concern as the disease itself. While the fight against cancer continues on every platform, decisions must be made most correctly in the right place at the right time.

Ethics

Peer-review: External and internal peer-reviewed.

Authorship Contributions

Surgicaland Medical Practices: M.Y., Ö.A., Concept: M.Y., Design: M.Y., Data Collection or Processing: M.Y., Ö.A., Analysis or Interpretation: M.Y., Literature Search: M.Y., Ö.A., Writing: M.Y.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

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