ORIGINAL ARTICLE

CrossMark

Management and survival analysis of elderly patients with a cancer in the digestive system who refused to receive anticancer treatments

Jun Wan[1] · Shiping Xu[1] · Yinqiao Wu[1] · Benyan Wu[1] · Dezhong Joshua Liao[2] · Ningzhi Xu[3] · Gangshi Wang[1]

Abstract

Treatment and management of cancers in elderly patients require some special considerations. A better understanding of how cancers progress in those elderly patients who have not received any anticancer treatments could better help us in treating these patients and in making end-of-life decisions. Over the past years, we had encountered 57 elderly patients, aged 75 to 94 years (87.6 on average), with a cancer in the digestive system, who refused to accept anticancer treatment but who did receive the best available supportive and palliative care. Clinicopathological data of these patients were analyzed. Of these 57 cases, 49 were at an advanced or late stage, while the remaining eight were at an early stage at the time of diagnosis. The median overall survival time of all the patients was 11 months, and almost the entire cohort manifested multiple-organ impairments. The average number of malfunctioning organs per patient was 3.68. After carefully predicting, and then preventing or managing complications, only 54.4% of the patients eventually died of multiple-organ functional failure. Nearly 18% of the single organ dysfunctions were finally well-controlled. Our data provide the first statistical information on the survival time and the direct cause of death of the elderly patients with a cancer in the digestive system not treated with chemotherapy or other direct anticancer interventions, but who did receive the best available supportive and palliative cares. During their struggle with cancer, elderly patients clearly could benefit from prophylactic interventions on organ dysfunction.

Keywords Geriatrics · Survival time · Cancer · Chemotherapy · Surgery · Radiotherapy

Introduction

Most countries have shown a great increase in human life expectancy over the last several decades. Along with this, however, is an aging-related increase in cancer incidence [1].

✉ Dezhong Joshua Liao
  djliao@gmc.edu.cn

✉ Ningzhi Xu
  xuningzhi@cicams.ac.cn

✉ Gangshi Wang
  wanggangshi@hotmail.com

1   Department of Geriatric Gastroenterology, Chinese PLA General Hospital, Beijing 100853, People's Republic of China

2   Department of Pathology, Guizhou Medical University Hospital, Guiyang 550004, Guizhou, People's Republic of China

3   Laboratory of Cell and Molecular Biology & State Key Laboratory of Molecular Oncology, National Cancer Center/Cancer Hospital, Chinese Academy of Medical Sciences & Peking Union Medical College, Beijing 100021, People's Republic of China

Since even those elderly without a malignancy usually have some decline in major organ function, their cancers, especially over the age of 80, generally present with comorbidities. This can cause oncologists to experience some difficult treatment decisions, as complex conditions may affect not only the therapy efficacy but also its tolerability. On the other hand, it is believed that cancer in the elderly usually grows and progresses more slowly than in younger cancer patients [2]. Combining these situations, both beneficial and adverse, in the elderly, it is typically more practical to restrain, rather than attempt to cure, the cancer, to extend the patient's life and quality of life (QOL) while maintaining an adequate level of dignity. The reality is that in our clinical practice, many elderly cancer patients simply refuse further surgery or the often debilitating radio- or chemotherapy routinely given to younger patients. Many simply prefer care-directed treatments along with supportive symptom-management to maintain a relatively good QOL. In other words, palliative care plus good supportive care is often the patient's choice. However, this clinical goal is still a tremendous challenge to oncologists worldwide with many unsolved questions. For example, oncologists are

required to address some important issues when making management decisions for elderly cancer patients, including how to slow down or even stop progression of the cancer, how to prolong survival time, how to improve the QOL as the patient approaches his final days, and how to let the patient die with dignity. It would be ideal if the treatment decisions were made collectively by the physician and the patient, as well as the patient's family and even close friends, as already discussed in the literature [3, 4].

When elderly cancer patients refuse to take routine anticancer treatments such as surgical removal of the tumors and radio- or chemotherapy, what should be the goal of their treatment and management, and what, then, would be their survival time, compared with that obtained from the more traditional and vigorous anticancer therapy given to younger patient groups? These questions have gradually, but increasingly, become concerns of the medical fraternity. Some clinical practitioners and medical experts, especially those who deal with geriatric and/or oncologic patients, have started to believe that having a good QOL, until the very end of the life, should be our primary ultimate goal [5, 6].

In our oncology practice, we have now and then encountered elderly patients with a cancer of the digestive system who have refused, or could not receive, routine anticancer therapy. In this study, we analyzed and summarized the clinical data of these patients, including their primary diseases, organ impairments, and direct causes of death. These latter are intriguing because, while it is well-known that cancer kills mainly via its metastasis to and then destruction of distant organs, little statistical information is available on what actually causes the death of cancer patients. Data on the treatments during the course and on the patients' survival time are also presented, and the strengths and weaknesses of our management strategies for these patients are summarized and discussed.

Materials and methods

The study involved 57 elderly patients (49 males and 8 females), from 75 to 94 years of age (87.6 on average), with a cancer in the digestive system who were admitted into the Chinese PLA General Hospital in Beijing from January 2007 to December 2015. Patients had not received any of the usual anticancer therapies, including surgery, chemotherapy, radiotherapy, and targeted medicine. The best available supportive care and palliative care were provided to these patients to alleviate their symptoms, protect organ function, and prevent complications. There were several different reasons for not providing an anticancer treatment: (1) the tumors were in an advanced stage and could not be surgically removed, (2) there were comorbidities, (3) organ status

hampered the anticancer treatment, or (4) patients and/or their families refused to accept any anticancer therapy.

Medical records of the patients were retrieved and reviewed. The clinicopathological data identified included age, gender, tumor location, pathological findings, tumor stage at diagnosis, as well as assessments of the internal homeostasis and of the functions of the heart, lung, liver, kidney, gastrointestinal tract, and hematopoietic system. Clinical stage of the cancer was estimated based on the results of physical exams, imaging tests (x-rays, CT, and/or MRI scans), and tumor biopsies. Twenty-five cases of our cohort later underwent autopsy. Tumor staging at diagnosis was based on the TNM classification system [7]. Stage I was classified as an early cancer, whereas stages II and above were classified as advanced cancers. Various managements, cause of death, and survival time (from diagnosis to death) were also retrieved. The effects of active supportive care on survival and the maintenance of organ function were evaluated. The study was approved by the institutional ethical committee of the hospital, and its conduction was abided by the committee's guidelines. Since this is a retrospective statistical analysis on deceased patients' clinical data without disclosing the patients' identity, signed consent from the patients was not available and was not required according to the institutional ethical committee.

## Results

Survival time of the patients

The cancer types of the 57 cases included esophageal squamous cell carcinoma, gastric adenocarcinoma, duodenal adenocarcinoma, periampullary carcinoma, pancreatic ductal adenocarcinoma, primary hepatocellular carcinoma, intrahepatic/perihilar/distal cholangiocarcinoma, colon cancer, and rectal cancer. Of these 57 cases, 49 were at an advanced stage (12 at stage II, 12 at stage III, and 25 at stage IV), while the remaining eight (including five pancreatic ductal adenocarcinomas, two hepatocellular carcinomas, and one duodenal adenocarcinoma) cases were at an early stage. The median overall survival time was 11 months, but advanced-stage patients survived for a shorter period with their median overall survival being 7.28 months. The survival time of the early-stage subgroup was longer than that of the advanced-stage subgroup, as the median overall survival of five patients with an early-stage pancreatic cancer was 27 months, while the remaining nine patients with an advanced-stage pancreatic cancer survived for only 5 months. Within the advanced-stage subgroup, duodenal adenocarcinoma, primary hepatocellular carcinoma, and colon cancer patients tended to have a relatively longer survival, while pancreatic cancer and intrahepatic cholangiocarcinoma patients survived for the shortest time. Because we only

had one case each of esophageal squamous cell carcinoma, periampullary carcinoma, and rectal cancer, these cases were excluded from the comparisons. Among the advanced-stage patients, two cases of pancreatic cancer and one case of hilar bile duct carcinoma showed the shortest survival time (2 months). The longest survival time was 36 months in a patient with an advanced cancer in the distal common bile duct. In the early-stage group, a patient with a hepatocellular carcinoma (stage Ia) survived for 61 months, which was the longest in our cohort, followed by a case of an early duodenal adeno-carcinoma who lived for 53 months. The longest survival time of early pancreatic cancer in our cohort was 35 months.

Changes in organ function

During the course of their diseases, almost all patients experienced a decline in function of one or more major organs, such as heart, lung, liver, kidney, hematopoietic system, and gastrointestinal tract as well as total body homeostasis. As shown in Fig. 1, imbalance of homeostasis, including acid-and-base imbalance and electrolytic disturbance, was the most common morbidity and occurred in 56 patients. The only exception was the patient with esophageal carcinoma, who died suddenly of massive hemorrhage from the tumor. It was our anticipation that this patient might have shown imbalanced homeostasis as well, had he survived longer. The percentage of the patients with impairments of the lung, liver, or kidneys was 89.47, 77.19, or 66.67%, respectively, suggesting that these organs might be more easily affected. Common clinical symptoms included incontrollable lung infection and ensuing respiratory failure, as well as renal or hepatic injury and dysfunction caused by tumor invasion, infection, or the drugs administered. All patients in our cohort manifested impairment or dysfunction of two or more organ systems, with the average number of malfunctioning organs per patient being 3.68.
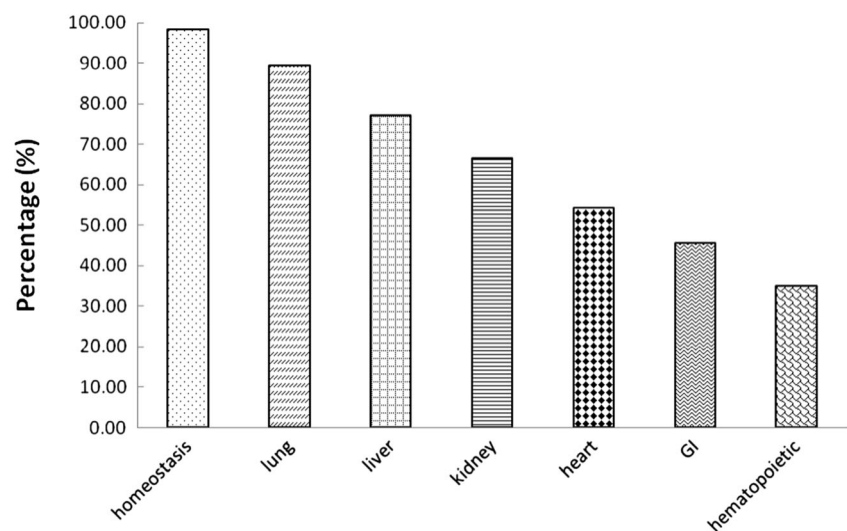
Treatments and managements

All patients received the best available supportive care and palliative care to alleviate the pain and improve QOL over their terminal stage of life, with the comprehensive therapies employed summarized in Table 1. Antibiotics were administered to all patients, as they all experienced infection in the lung, bile duct, and/or urinary tract. Twenty-one (36.8%) patients experienced cancer-caused pain and were given analgesics, and 77.2% of the patients were administered liver protective drugs due to impaired hepatic function. Bile duct stenting through endoscopic retrograde cholangiopancreatography (ERCP), or percutaneous transhepatic cholangial drainage (PTCD), was performed on 15 pancreatic, bile duct, or duodenal cancer patients with obstructive jaundice. The median overall survival from the jaundice-relieving operation to death was 160 days. Tracheal intubation was done in 27 patients, and the median overall survival from this procedure to death was a mere 12 days. Enteral and/or parenteral nutrition was applied to all 57 patients, of whom 77.2% had a nasogastric tube or duodenal catheterization while 96.5% received central venous catheterization or had a peripherally inserted central catheter (PICC). Plasma albumin, pre-albumin, and hemoglobin were determined 3 to 5 days before death, and their levels were 27.64 ± 3.99 g/L, 13.08 ± 3.72 mg/dL, and 83.7 ± 23.1 g/L, respectively.

Direct cause of the death

Although impairment of two or more organs occurred in all patients enrolled, only 54.4% of the patients eventually died of multiple-organ functional failure (MOSF). After active supportive and palliative cares, some patients died of single organ dysfunction, including lung failure after refractory lung infection, bile duct infection, liver failure, heart failure, and tumor bleeding causing hemorrhagic shock with ensuing heart

Fig. 1 Percentage of organs affected in elderly patients with digestive system cancer. GI gastrointestinal tract

Table 1 Summary of comprehensive therapies employed

Types of lesions	Number of cases with various management							
	Total	Antibiotics	Analgesics	Enteral nutrition tubes	Parenteral nutrition tubes	Liver protection	Bile duct stent or PTCD	Tracheal intubation
Esophageal carcinoma	1	1	0	1	1	0	0	0
Gastric adenocarcinoma	12	12	3	10	12	8	1	6
Duodenal adenocarcinoma	5	5	0	4	4	5	3	4
Periampullary carcinoma	1	1	1	1	1	1	1	0
Pancreatic ductal adenocarcinoma	14	14	7	9	14	10	5	7
Primary hepatocellular carcinoma	7	7	4	6	7	6	0	3
Cholangiocarcinoma	7	7	4	4	7	7	5	2
Colon cancer	9	9	2	8	8	6	0	4
Rectal cancer	1	1	0	1	1	1	0	1
Total	57	57	21	44	55	44	15	27

failure (Fig. 2). Functional failure of an organ is determined, as elsewhere, based on not only the patient's clinical symptoms but also data from laboratories and relevant instruments. Direct cause of the death is defined as the primary one, such as lung infection or tumor hemorrhage, which triggers severe functional impairment of the affected organ and probably also other organ(s), eventually leading to heart failure and ensuing death of the patient.

There were 51 (89.5%) cases of lung infection, 44 (77.2%) cases of liver functional injury, and 38 (66.7%) cases of kidney impairment in our cohort. There were 17.6% (nine cases), 15.9% (nine cases), and 18.4% (seven cases) of the patients whose lung infection, liver injury, and kidney impairment,

respectively, were well-controlled (Fig. 3). None of our patients died of acid/base imbalance or electrolyte disturbance.

Discussion

The significance of palliative and supportive cares

Aging is typically associated with a higher risk of comorbidity. Elders often manifest a decline in physical and cognitive functions, and their social supports are often reduced. It is more common, compared with younger patients, that tumors in elders are already at an advanced stage or even already have distant metastases at the time of diagnosis, albeit tumors in elders usually grow and progress more slowly than in younger patients. Because of these factors, elderly cancer patients usually show a poorer prognosis and a shorter survival time, compared with younger adult patients. It has been reported that elderly cancer patients are less likely to be treated with
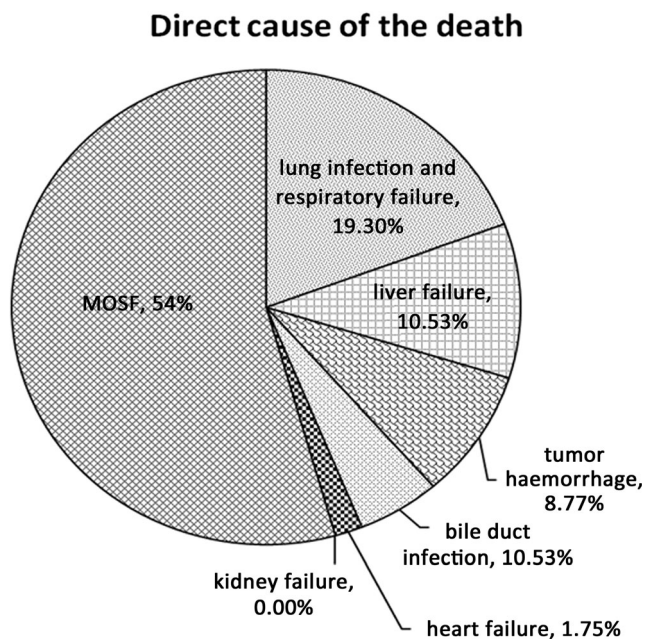

Fig. 2 Direct causes of the death in elderly patients with a digestive system cancer
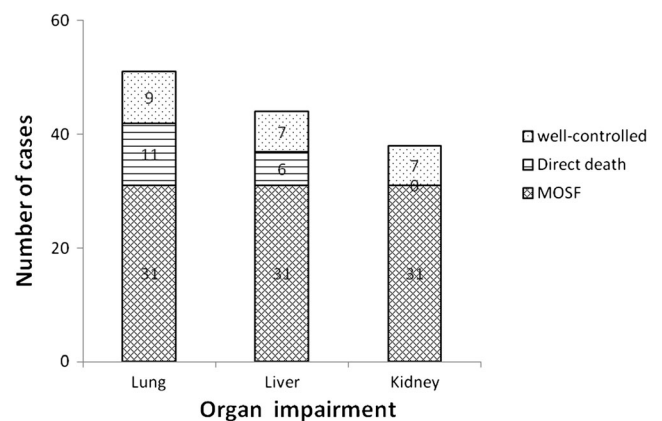

Fig. 3 Consequences of organ impairment, with number of patients recovered from their lung, liver, or kidney injury after treatment. MOSF multiple-organ functional failure

surgery, chemotherapy, or radiation [8]. A recent population-based study from Italy revealed that only 58 of 1183 (5.8%) elderly patients at ages of ≥ 80 years received chemotherapy, in contrast to an average of 34.3% of their junior counterparts [9]. Due to the toxicity of chemotherapy or because of other concerns such as infection or other comorbidities, a higher percentage of elderly patients are hospitalized than their young counterparts. Chemotherapy recipients have a substantially higher hospitalization rate for infection or fever, hematologic complications, dehydration, and pulmonary embolism (PE) or deep vein thrombosis (DVT), compared with those who have not received chemotherapy [10]. Modern chemotherapy and targeted therapy have improved the overall outcomes of patients for all ages. However, the results observed in real clinical practice are often different from those reported in clinical trials, especially in elderly patients, according to our own experiences. Albeit most cancer patients are at a senior age, there are few specific treatment-based guidelines for elderly cancer patients. In our opinion, this may be due to the limited number of such patients recruited in clinical trials. Of course, there are some data to support that the general health situation of some elderly patients is good enough to tolerate modified therapies. In fact, individualized treatment for elderly cancer patients requires concerns other than their age. When treating elderly cancer patients, oncologists are advised to make a comprehensive assessment, using such tools as a geriatric assessment or predictive chemotherapy toxicity tools, as the basis for making an optimal therapy regimen. The International Society for Geriatric Oncology and the NCCN guidelines both recommend performing a geriatric assessment in all elderly cancer patients [11, 12]. Factors such as functional status of major organs, social support, patient's preference, presence of comorbidities, and life expectancy should be taken into consideration when formulating an optimal treatment regimen. Therefore, for elderly cancer patients, it is important to weigh the risk of dying from cancer against the risk of dying from a possible comorbidity or from a treatment-caused complication.

A large percentage of patients with an advanced cancer receive a long course of aggressive treatments, including chemotherapy and/or radiotherapy, until the moribund period of the patient's life, despite the fact that this may actually reflect a poor quality of care. A survey was recently conducted on the family members of elderly lung or colorectal cancer patients who eventually died. The results show that an earlier hospice enrollment, avoidance of ICU admission within 30 days of death, and death at a non-hospital location are associated with a perception of a better end-of-life care [13]. In 2012, the American Society of Clinical Oncology (ASCO) published a provisional clinical opinion (PCO) advising its members that "… combined standard oncology care and palliative care should be considered early in the course of illness for any patient with metastatic cancer and/or a high symptom burden"

[14]. This recommendation is based on several randomized clinical trials of palliative care interventions during conventional anticancer treatments of patients with a metastatic cancer. To date, it has become possible to drive some malignancies into a manageable, chronic, situation via current treatments and managements, making it possible for some incurable patients to live with the cancer in relative peace and comfort. And, perhaps most importantly, many patients and families have "dying with dignity" as their main goal. Realizing this, fulfilling this goal should also be important to the oncologist. The patients in our cohort were provided with the best available supportive and palliative care regimens instead of purely medical anticancer therapies, and thus, their "from early-to-terminal-stage" course of cancer progression is relatively closer to the natural one compared with the one shown in those patients receiving route anticancer treatments. The median overall survival of our group is similar to that of routine anticancer therapy groups reported in the literature [15–20]. The newest SEER data (from 1988 to 2012) indicates that the rates of 1-year survival in liver/intrahepatic bile duct cancer and pancreatic cancer patients over 75 years of age are 25.6 and 15.8%, respectively [1]. In our cohort, four out of five patients with an advanced liver cancer survived 12 months or longer, while two patients with an advanced pancreatic cancer survived 12 months after diagnosis. Therefore, our data, although just from a relatively small number of patients, imply that active supportive and palliative therapies alone can provide a relatively good QOL and survival times comparable to a traditional, aggressively treated, group of senior patients with a lethal and advanced malignancy.

In our opinion, the word "manage" may be more proper than "treat" to describe how we should approach therapy in our daily oncological practice. Nutritional support, maintenance of internal homeostasis, management of various complications (pain, infection, jaundice), protection of organ functions, and even psychological intervention are fundamental elements of a comprehensive and systematic implementation for cancer patients. All patients in our cohort had supplemental enteral and/or parenteral nutrition support, resulting in a relatively high level of serum pre-albumin. Proper levels of albumin and hemoglobin are important for the maintenance of whole-body physiological function and are significant factors in the patients' survival [21]. Up to two-thirds of all elderly patients develop pain as a result of the cancer or as a consequence of its treatment [22], but in this study, only 36.8% of the patients accepted pain-relieving drugs when apparently needed. This phenomenon may be partly because some tumors may not cause as much pain as we think, or merely because some seniors are less likely to complain of pain [23]. Obstructive jaundice in patients with pancreatic cancer, cholangiocarcinoma, or hepatocarcinoma may predict an unfavorable survival, and drainage of jaundice will help to improve liver function [24, 25]. The obstructive jaundice patients

in our cohort obviously benefited from positive jaundice-reducing procedures such as PTCD or bile duct stenting, since the median overall survival is significantly prolonged after these treatments. Less than half of our patients accepted tracheal intubation, with the median overall survival after the mechanical ventilation to death being merely 12 days, suggesting that such invasive manipulation was not beneficial to the patients and thus, in our opinion, should not often be a primary choice.

The first statistical information on the direct causes of cancer-caused death

When asked "how does a cancer kill the patient?", most oncologists can only give such examples as "liver cancer patients may die of tumor hemorrhage" and "some lung cancer patients may die of infection", but few, if any, oncologists can give good statistics about how each direct cause, such as infection, heart failure, or renal failure, may account for the percentage of deaths for any given cancer type. This is in part because different patients with the same type of cancer may die from different causes. Textbooks of medicine generally describe that patients with end-stage cancer die of MOSF, which is true in a broad sense, since the body cannot survive when one or more important organs have lost function. Patients who have or have not received anticancer treatments may die from different reasons, because the treatments themselves likely alter, and usually damage, the functions of major organs, including the immune system. Our report is one of the few, if not the only, studies of this kind to provide a percentage of common causes of death for elderly patients with a cancer in the digestive system who have not received any direct anticancer treatments but who have received the best supportive and palliative cares. Oncology peers can make their own evaluations on the value of such cares on the patients' survival time with our data as a reference.

Organ failure could be regarded as the direct cause of the patient's death. The following are the situations often encountered during our clinical practice: severe infection inducing septic shock, lung infection leading to respiratory failure, bile duct obstruction causing liver failure, hypercoagulation prompting a myocardial infarction, tumor rupture causing massive hemorrhage and ensuing hemorrhagic shock, complex hematologic complications, kidney failure due to various reasons. Many patients could have an even more complex situation, because they have more than two organs involved and eventually develop MOSF. However, only 54.39% of the patients in our cohort died of MOSF, with the rest dying from single organ dysfunction or from a single complication such as massive hemorrhage. In our cohort, 15.9% of the patients with liver impairment were well controlled, as were 18.4% of the patients with kidney impairment.

It is worth noting that cancer patients at terminal stages are usually bedridden, which easily causes infection in the lung or the urinary system, as shown in our cohort in which nearly 89.5% of the patients manifested lung infection with functional impairment. Uncontrolled infection will certainly accelerate the patient's death, and therefore antibiotics, in most cases routed via intravenous infusion, become inevitable for most patients. Fortunately, about 17.6% of the patients with lung infection were finally well controlled. Therefore, foreseeing possible dysfunction of an organ and actively preventing its occurrence are fundamental in the management of elders with an advanced cancer. These management goals can improve patients' QOL and prolong their survival time. The complexity of available treatments poses a challenge to oncologists in discussing the choice of cancer treatment with their patients, since chemotherapy, radiotherapy, or even targeted therapy are not the only important factors that influence the patients' survival and QOL. Routine chemotherapy and radiotherapy are likely to be associated with toxicity and are thus associated with a significantly increased risk of organ impairment [10]. Some of these weaknesses could be avoided by prophylactic interventions. In our humble opinion, (1) foreseeing and (2) diminishing a possible organ dysfunction should be two key elements of cancer management.

Conclusions

In summary, we provide data, for the first time, on the course of elderly patients with a cancer in the digestive system who receive the best supportive and palliative care but never receive an anticancer treatment. All the patients eventually died of dysfunction of one or more organs, but only slightly over half of them died from MOSF owing to our good prediction and pre-intervention of the problem. Our elderly patients obviously benefitted from prophylactic interventions of organ dysfunction as well as from active nutritional support and anti-infection treatment. It is recommended that one should pay more attention to organ protection as one of the most fundamental elements of comprehensive cancer management in elderly cancer patients.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical approval This article does not contain any study with animals. All procedures performed in studies involving human participants were in

accordance with the ethical standards of the institutional (Chinese PLA General Hospital) and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Statement on consent for participation This is a retrospective statistical analysis on deceased patients' clinical data without disclosing the patients' identity. Signed consent from the patients was not available and is not required according to the ethical committee of Chinese PLA General Hospital.

References

1. National Cancer Institute (2016) SEER Cancer Statistics Review, 1975–2013. Howlader N NAKMMDBKASKCYMRJTZMALDCHFECK, ed. (Bethesda, MD:), pp. http://seer.cancer.gov/csr/1975_2013/

2. Tavares A, Gandra A, Viveiros F, Cidade C, Maciel J (2013) Analysis of clinicopathologic characteristics and prognosis of gastric cancer in young and older patients. Pathol Oncol Res 19:111–117

3. PDQ Supportive and Palliative Care Editorial Board (2016) Quality of end-of-life care in patients with advanced cancer. In Planning the transition to end-of-life care in advanced cancer (PDQ); Health Professional Version,), pp. 2002-.". from http://www.ncbi.nlm.nih.gov/books/NBK223164/

4. Steinhauser KE, Christakis NA, Clipp EC, McNeilly M, McIntyre L, Tulsky JA (2000) Factors considered important at the end of life by patients, family, physicians, and other care providers. JAMA 284:2476–2482

5. Zhang B, Nilsson ME, Prigerson HG (2012) Factors important to patients' quality of life at the end of life. Arch Intern Med 172:1133–1142

6. Zimmermann C, Burman D, Swami N, Krzyzanowska MK, Leighl N, Moore M, Rodin G, Tannock I (2011) Determinants of quality of life in patients with advanced cancer. Support Care Cancer 19:621–629

7. Edge SB C.C.F.A.G.F.T.A (2010) AJCC cancer staging manual. Edge SB CCFAGFTA, ed. New York, Springer

8. Rauh-Hain JA, Pepin KJ, Meyer LA, Clemmer JT, Lu KH, Rice LW, Uppal S, Schorge JO, Del Carmen MG (2015) Management for elderly women with advanced-stage, high-grade endometrial cancer. Obstet Gynecol 126(6):1198–1206. https://doi.org/10.1097/AOG.0000000000001140

9. Maffei S, Colantoni A, Kaleci S, Benatti P, Tesini E, de Leon MP (2016) Clinical features of colorectal cancer patients in advanced age: a population-based approach. Intern Emerg Med 11:191–197

10. O'Neill CB, Atoria CL, O'Reilly EM, Henman MC, Bach PB, Elkin EB, O'Neill CB, Atoria CL, O'Reilly EM, Henman MC et al (2016) ReCAP: hospitalizations in older adults with advanced cancer: the role of chemotherapy. J Oncol Pract 12(2):151–152. https://doi.org/10.1200/JOP.2015.004812

11. Hurria A (2013) Management of elderly patients with cancer. J Natl Compr Cancer Netw 11(5S):698–701. https://doi.org/10.6004/jnccn.2013.0205

12. Wedding U (2015) Report on the 14th conference of the International Society of Geriatric Oncology. Future Oncol 11(6):893–895. https://doi.org/10.2217/fon.15.4

13. Wright AA, Keating NL, Ayanian JZ, Chrischilles EA, Kahn KL, Ritchie CS, Weeks JC, Earle CC, Landrum MB (2016) Family perspectives on aggressive cancer care near the end of life. JAMA 315:284–292

14. Smith TJ, Temin S, Alesi ER, Abernethy AP, Balboni TA, Basch EM, Ferrell BR, Loscalzo M, Meier DE, Paice JA, Peppercorn JM, Somerfield M, Stovall E, von Roenn JH (2012) American Society of Clinical Oncology provisional clinical opinion: the integration of palliative care into standard oncology care. J Clin Oncol 30(8):880–887. https://doi.org/10.1200/JCO.2011.38.5161

15. Hammel P, Huguet F, van Laethem JL, Goldstein D, Glimelius B, Artru P, Borbath I, Bouche O, Shannon J, Andre T et al (2016) Effect of chemoradiotherapy vs chemotherapy on survival in patients with locally advanced pancreatic cancer controlled after 4 months of gemcitabine with or without erlotinib: the LAP07 randomized clinical trial. JAMA 315(17):1844–1853. https://doi.org/10.1001/jama.2016.4324

16. Karve S, Lorenzo M, Liepa AM, Hess LM, Kaye JA, Calingaert B (2015) Treatment patterns, costs, and survival among medicare-enrolled elderly patients diagnosed with advanced stage gastric cancer: analysis of a linked population-based cancer registry and administrative claims database. J Gastric Cancer 15:87–104

17. Miller KD, Siegel RL, Lin CC, Mariotto AB, Kramer JL, Rowland JH, Stein KD, Alteri R, Jemal A (2016) Cancer treatment and survivorship statistics, 2016. CA Cancer J Clin 66(4):271–289. https://doi.org/10.3322/caac.21349

18. Patel SS, Nelson R, Sanchez J, Lee W, Uyeno L, Garcia-Aguilar J, Hurria A, Kim J (2013) Elderly patients with colon cancer have unique tumor characteristics and poor survival. Cancer 119:739–747

19. Shah MA, Janjigian YY, Stoller R, Shibata S, Kemeny M, Krishnamurthi S, Su YB, Ocean A, Capanu M, Mehrotra B, Ritch P, Henderson C, Kelsen DP (2015) Randomized multicenter phase II study of modified docetaxel, cisplatin, and fluorouracil (DCF) versus DCF plus growth factor support in patients with metastatic gastric adenocarcinoma: a study of the US gastric cancer consortium. J Clin Oncol 33(33):3874–3879. https://doi.org/10.1200/JCO.2015.60.7465

20. van Steenbergen LN, Lemmens VE, Rutten HJ, Wymenga AN, Nortier JW, Janssen-Heijnen ML (2012) Increased adjuvant treatment and improved survival in elderly stage III colon cancer patients in The Netherlands. Ann Oncol 23:2805–2811

21. Ruiz-Tovar J, Martin-Perez E, Fernandez-Contreras ME, Reguero-Callejas ME, Gamallo-Amat C (2010) Impact of preoperative levels of hemoglobin and albumin on the survival of pancreatic carcinoma. Rev Esp Enferm Dig 102:631–636

22. Rao A, Cohen HJ (2004) Symptom management in the elderly cancer patient: fatigue, pain, and depression. J Natl Cancer Inst Monogr 2004(32):150–157. https://doi.org/10.1093/jncimonographs/lgh031

23. Nipp R, Sloane R, Rao AV, Schmader KE, Cohen HJ (2012) Role of pain medications, consultants, and other services in improved pain control of elderly adults with cancer in geriatric evaluation and management units. J Am Geriatr Soc 60(10):1912–1917. https://doi.org/10.1111/j.1532-5415.2012.04143.x

24. Baron TH, Grimm IS (2016) Relief of obstructive jaundice from pancreatic cancer: the end of the plastic stent era? Gut 65(2):191–192. https://doi.org/10.1136/gutjnl-2015-310519

25. Nakata B, Amano R, Kimura K, Hirakawa K (2013) Comparison of prognosis between patients of pancreatic head cancer with and without obstructive jaundice at diagnosis. Int J Surg 11:344–349