ISSN 1948-9366 (online)

World Journal of *Gastrointestinal Surgery*

World J Gastrointest Surg 2024 August 27; 16(8): 2365-2747

Published by Baishideng Publishing Group Inc

World Journal of Gastrointestinal Surgery

Contents

Monthly Volume 16 Number 8 August 27, 2024

EDITORIAL

2365 Immunotherapy for gastric cancer and liver metastasis: Is it time to bid farewell

Dehal A

2369 Role of endoscopic ultrasound-guided biliary drainage for palliation of malignant biliary obstruction

Singh S, Chandan S, Facciorusso A

2374 Consideration on immunotherapy of liver metastases of malignant tumors

Jiang C, Zhang ZH, Li JX

2382 Beyond total mesorectal excision: The emerging role of minimally invasive surgery for locally advanced rectal cancer

Perini D, Cammelli F, Scheiterle M, Martellucci J, Di Bella A, Bergamini C, Prosperi P, Giordano A

2386 Clinical application value of long non-coding RNAs signatures of genomic instability in predicting prognosis of hepatocellular carcinoma

Xing XW, Huang X, Li WP, Wang MK, Yang JS

2393 Treatment strategy and therapy based on immune response in patients with gastric cancers

Jacenik D, Fichna J

FRONTIER

2396 Problems with repairing gut sphincters malfunctions

Bortolotti M

REVIEW

2409 Advancements in nutritional diagnosis and support strategies during the perioperative period for patients with liver cancer

Li XQ, Liang Y, Huang CF, Li SN, Cheng L, You C, Liu YX, Wang T

ORIGINAL ARTICLE

Case Control Study

2426 Surgical resection and neoadjuvant therapy in patients with gastric cancer and ovarian metastasis: A real-world study

Yan HP, Lu HR, Zhang YX, Yang L, Chen ZL

2436 Alteration of ascending colon mucosal microbiota in patients after cholecystectomy

Fan MY, Jiang QL, Cui MY, Zhao MQ, Wang JJ, Lu YY

Retrospective Cohort Study

2451 Survival prognostic analysis of laparoscopic D2 radical resection for locally advanced gastric cancer: A multicenter cohort study

Sun XM, Liu K, Wu W, Meng C

2461 Benefits of jejunostomy feeding in patients who underwent gastrectomy for cancer treatment

Jaquet R, Rivkine E, De Souza N, Roudié J

2474 Application of ^{18}F-fluorodeoxyglucose positron emission tomography/computed tomography imaging in recurrent anastomotic tumors after surgery in digestive tract tumors

Ge DF, Ren H, Yang ZC, Zhao SX, Cheng ZT, Wu DD, Zhang B

2484 Impact of minimally invasive surgery on immune function and stress response in gastric cancer patients

Zhu RH, Li PC, Zhang J, Song HH

2494 Assessment of perianal fistulizing Crohn's disease activity with endoanal ultrasound: A retrospective cohort study

Hong N, Liu WY, Zhang JL, Qian K, Liu J, Ye XJ, Zeng FY, Yu Y, Zhang KG

2503 Lymph node dissection does not affect the survival of patients with tumor node metastasis stages I and II colorectal cancer

He F, Qu SP, Yuan Y, Qian K

Retrospective Study

2511 Energy spectrum computed tomography multi-parameter imaging in preoperative assessment of vascular and neuroinvasive status in gastric cancer

Wang J, Liang JC, Lin FT, Ma J

2521 Clinical significance of peripheral blood immune cells in patients with gastric cancer after surgery

Wang QW, Zhu JW, Gong LZ

2528 Lone-Star retractor perineal exposure method for laparoscopic abdominal perineal resection of rectal cancer

Ma J, Tang DB, Tang YQ, Wang DT, Jiang P, Zhang YM

2538 Indication of conservative treatment by antibiotics for uncomplicated and complicated acute appendicitis

Hosokawa Y, Moritani M, Makuuchi Y, Nagakawa Y

2546 Preoperative prediction of hepatocellular carcinoma microvascular invasion based on magnetic resonance imaging feature extraction artificial neural network

Xu JY, Yang YF, Huang ZY, Qian XY, Meng FH

2555 Transmembrane serine protease 4 expression in the prognosis of radical resection for biliary tract cancer

Shibata Y, Sudo T, Tazuma S, Tanimine N, Onoe T, Shimizu Y, Yamaguchi A, Kuraoka K, Takahashi S, Tashiro H

2565 Systemic immune-inflammation index combined with pediatric appendicitis score in assessing the severity and prognosis for paediatric appendicitis

Guo LM, Jiang ZH, Liu HZ

2574 Establishment of predictive models and determinants of preoperative gastric retention in endoscopic retrograde cholangiopancreatography

Jia Y, Wu HJ, Li T, Liu JB, Fang L, Liu ZM

2583 Prediction model establishment and validation for enteral nutrition aspiration during hospitalization in patients with acute pancreatitis

Hou P, Wu HJ, Li T, Liu JB, Zhao QQ, Zhao HJ, Liu ZM

2592 New anti-mesenteric delta-shaped stapled anastomosis: Technical report with short-term postoperative outcomes in patients with Crohn's disease

Lee JL, Yoon YS, Lee HG, Kim YI, Kim MH, Kim CW, Park IJ, Lim SB, Yu CS

2602 Construction of a predictive model for gastric cancer neuroaggression and clinical validation analysis: A single-center retrospective study

Lan YY, Han J, Liu YY, Lan L

2612 Efficiency and safety of laparoscopic left hemihepatectomy: A study of intrathecal *vs* extrathecal Glissonean pedicle techniques

Kang LM, Xu L, Zhang FW, Yu FK, Lang L

2620 Predictive utility of the Rockall scoring system in patients suffering from acute nonvariceal upper gastrointestinal hemorrhage

Han DP, Gou CQ, Ren XM

Observational Study

2630 Nomogram predicting the prognosis of primary liver cancer after radiofrequency ablation combined with transcatheter arterial chemoembolization

Shen HH, Hong YR, Xu W, Chen L, Chen JM, Yang ZG, Chen CH

2640 Relationship between postoperative rehabilitation style, gastrointestinal function, and inflammatory factor levels in children with intussusception

Wei XY, Huo HC, Li X, Sun SL, Zhang J

Prospective Study

2649 Innovative integration of lung ultrasound and wearable monitoring for predicting pulmonary complications in colorectal surgery: A prospective study

Lin C, Wang PP, Wang ZY, Lan GR, Xu KW, Yu CH, Wu B

Randomized Controlled Trial

2662 Effects of fluid therapy combined with a preoperative glucose load regimen on postoperative recovery in patients with rectal cancer

Xia LC, Zhang K, Wang CW

World Journal of Gastrointestinal Surgery

Monthly Volume 16 Number 8 August 27, 2024

Contents

Randomized Clinical Trial

2671 Application value of dexmedetomidine in anesthesia for elderly patients undergoing radical colon cancer surgery

Bu HM, Zhao M, Ma HM, Tian XP

Basic Study

2679 Effect of growth hormone on colonic anastomosis after intraperitoneal administration of 5-fluorouracil, bleomycin and cisplatin: An experimental study

Lambrou I, Mantzoros I, Ioannidis O, Tatsis D, Anestiadou E, Bisbinas V, Pramateftakis MG, Kotidis E, Driagka B, Kerasidou O, Symeonidis S, Bitsianis S, Sifaki F, Angelopoulos K, Demetriades H, Angelopoulos S

SYSTEMATIC REVIEWS

2689 Management of distal cholangiocarcinoma with arterial involvement: Systematic review and case series on the role of neoadjuvant therapy

Hall LA, Loader D, Gouveia S, Burak M, Halle-Smith J, Labib P, Alarabiyat M, Marudanayagam R, Dasari BV, Roberts KJ, Raza SS, Papamichail M, Bartlett DC, Sutcliffe RP, Chatzizacharias NA

SCIENTOMETRICS

2702 Global research landscape of Peutz-Jeghers syndrome and successful endoscopic management of intestinal intussusception in patients with recurrent laparotomies

Sun Q, Wang XY, Guo GJ, Wang L, Meng LM, Guo YF, Sun T, Ning SB

CASE REPORT

2719 Ultrasound-guided peripheral nerve blocks for anterior cutaneous nerve entrapment syndrome after robot-assisted gastrectomy: A case report

Saito Y, Takeuchi H, Tokumine J, Sawada R, Watanabe K, Yorozu T

2724 Primary coexisting adenocarcinoma of the colon and neuroendocrine tumor of the duodenum: A case report and review of the literature

Fei S, Wu WD, Zhang HS, Liu SJ, Li D, Jin B

2735 Anorectal hemangioma, a rare cause of lower gastrointestinal bleeding, treated with selective embolization: A case report

Pospisilova B, Frydrych J, Krajina A, Örhalmi J, Kajzrlikova IM, Vitek P

LETTER TO THE EDITOR

2742 Hepatic recompensation according to the Baveno VII criteria *via* a transjugular intrahepatic portosystemic shunt: Is this true?

Zhang JS

2745 Machine learning in predicting postoperative complications in Crohn's disease

Zhang LF, Chen LX, Yang WJ, Hu B

World Journal of Gastrointestinal Surgery

Monthly Volume 16 Number 8 August 27, 2024

Contents

ABOUT COVER

Editorial Board Member of *World Journal of Gastrointestinal Surgery*, Gaetano Gallo, FASCRS, FEBS (Coloproctology), MD, PhD, Academic Research, Professor, Department of Surgery, University of Rome, Rome 00161, Italy. ga.gallo@uniroma1.it

AIMS AND SCOPE

The primary aim of *World Journal of Gastrointestinal Surgery* (*WJGS*, *World J Gastrointest Surg*) is to provide scholars and readers from various fields of gastrointestinal surgery with a platform to publish high-quality basic and clinical research articles and communicate their research findings online.

WJGS mainly publishes articles reporting research results and findings obtained in the field of gastrointestinal surgery and covering a wide range of topics including biliary tract surgical procedures, biliopancreatic diversion, colectomy, esophagectomy, esophagostomy, pancreas transplantation, and pancreatectomy, *etc*.

INDEXING/ABSTRACTING

The *WJGS* is now abstracted and indexed in Science Citation Index Expanded (SCIE, also known as SciSearch®), Current Contents/Clinical Medicine, Journal Citation Reports/Science Edition, PubMed, PubMed Central, Reference Citation Analysis, China Science and Technology Journal Database, and Superstar Journals Database. The 2024 Edition of Journal Citation Reports® cites the 2023 journal impact factor (JIF) for *WJGS* as 1.8; JIF without journal self cites: 1.7; 5-year JIF: 1.9; JIF Rank: 123/290 in surgery; JIF Quartile: Q2; and 5-year JIF Quartile: Q3.

RESPONSIBLE EDITORS FOR THIS ISSUE

NAME OF JOURNAL
World Journal of Gastrointestinal Surgery

ISSN
ISSN 1948-9366 (online)

LAUNCH DATE
November 30, 2009

FREQUENCY
Monthly

EDITORS-IN-CHIEF
Peter Schemmer

EDITORIAL BOARD MEMBERS
https://www.wjgnet.com/1948-9366/editorialboard.htm

PUBLICATION DATE
August 27, 2024

INSTRUCTIONS TO AUTHORS
https://www.wjgnet.com/bpg/gerinfo/204

GUIDELINES FOR ETHICS DOCUMENTS
https://www.wjgnet.com/bpg/GerInfo/287

GUIDELINES FOR NON-NATIVE SPEAKERS OF ENGLISH
https://www.wjgnet.com/bpg/gerinfo/240

PUBLICATION ETHICS
https://www.wjgnet.com/bpg/GerInfo/288

PUBLICATION MISCONDUCT
https://www.wjgnet.com/bpg/gerinfo/208

ARTICLE PROCESSING CHARGE
https://www.wjgnet.com/bpg/gerinfo/242

STEPS FOR SUBMITTING MANUSCRIPTS
https://www.wjgnet.com/bpg/GerInfo/239

ONLINE SUBMISSION
https://www.f6publishing.com

World Journal of Gastrointestinal Surgery

Submit a Manuscript: https://www.f6publishing.com

World J Gastrointest Surg 2024 August 27; 16(8): 2365-2368

DOI: 10.4240/wjgs.v16.i8.2365

ISSN 1948-9366 (online)

EDITORIAL

Immunotherapy for gastric cancer and liver metastasis: Is it time to bid farewell

Ahmed Dehal

Specialty type: Gastroenterology and hepatology

Provenance and peer review: Invited article; Externally peer reviewed.

Peer-review model: Single blind

Peer-review report's classification

Scientific Quality: Grade B, Grade B, Grade C

Novelty: Grade B, Grade B, Grade B

Creativity or Innovation: Grade B, Grade B, Grade C

Scientific Significance: Grade B, Grade B, Grade B

P-Reviewer: Chen SY, China; Cheng J, China; Wang LH, China

Received: March 8, 2024

Revised: May 20, 2024

Accepted: June 5, 2024

Published online: August 27, 2024

Processing time: 160 Days and 15.9 Hours

Ahmed Dehal, Department of Clinical Sciences, Kaiser Permanente School of Medicine, Panorama, CA 91402, United States

Corresponding author: Ahmed Dehal, FACS, FRCS, MD, Associate Professor, Surgical Oncologist, Department of Clinical Sciences, Kaiser Permanente School of Medicine, 13652 Cantara Street, Panorama, CA 91402, United States. ahmed.n.dehal@kp.org

Abstract

Patients with metastatic gastric cancer have a grim prognosis. Palliative chemotherapy offers a limited survival improvement, but recent advancements in immunotherapy have sparked hope. However, the effectiveness of immunotherapy in patients with liver metastases remains debated. This article reviews a recent study by Liu *et al* and evaluates conflicting evidence on the impact of liver metastases on response to immunotherapy in metastatic gastric cancer. While some studies suggest no significant difference in treatment response based on liver involvement, others report varied response rates. The present study, a retrospective analysis of 48 patients by Liu *et al*, examines this issue and concludes that immunotherapy is less effective in patients with liver metastases. Despite methodological limitations and a small sample size, the study contributes to the ongoing discourse. The nuanced response to immunotherapy in certain patients underscores the importance of understanding the tumor microenvironment, immune cell infiltration, and the expression of immune checkpoints. Rather than dismissing immunotherapy for patients with gastric cancer and liver metastases, a shift towards personalized treatment strategies and a more profound understanding of tumor-specific biomarkers is essential. By unraveling the molecular intricacies of individual cases, clinicians may tailor more effective and customized treatments, offering a glimmer of hope for this challenging patient group.

Key Words: Immunotherapy; Gastric cancer; Liver metastasis; Efficacy; Prognosis

Core Tip: The prognosis of patients with gastric cancer and liver metastasis is abysmal. Palliative chemotherapy is associated with a limited survival benefit yet is very toxic. Immunotherapy is considered an emerging promising therapy with some remarkable results. There has been a growing body of literature from animal and human studies that question the efficacy of immunotherapy in these patients. In this article, we discuss this issue and provide a balanced appraisal of the literature.

Citation: Dehal A. Immunotherapy for gastric cancer and liver metastasis: Is it time to bid farewell. *World J Gastrointest Surg* 2024; 16(8): 2365-2368
URL: https://www.wjgnet.com/1948-9366/full/v16/i8/2365.htm
DOI: https://dx.doi.org/10.4240/wjgs.v16.i8.2365

INTRODUCTION

The median survival of patients with metastatic gastric cancer is only 3 to 5 months without treatment. Palliative chemotherapy may prolong survival to approximately 9-11 months in patients with Her2-negative disease[1]. Recently, immunotherapy has emerged as a promising therapy after a remarkable response in various malignancies. Results from several randomized trials, including the Checkmate-649[2] trial and the KEYNOTE-158[3] trial, which showed improved survival compared to chemotherapy, led to the approval of drugs such as Nivolumab and Pembrolizumab, respectively.

Current recommendations for the management of patients with HER2-negative metastatic gastric cancer include Fluoropyrimidine, oxaliplatin, or Cisplatin, with or without nivolumab or pembrolizumab as first-line therapy, followed by Ramucirumab and paclitaxel, Docetaxel, Paclitaxel, Irinotecan, Fluorouracil, or irinotecan as a second line therapy[4]. However, several pre-clinical[5] and clinical studies[6-8] have suggested reduced efficacy of immunotherapy in patients with liver metastases in melanoma and non-small cell lung cancer. Scientific observation from animal studies nicely described the mechanisms for this phenomenon. Liver metastases induce a systemic loss of antigen-specific T cells, siphon activated CD8+ T cells from the systemic circulation, reduce peripheral T cell numbers, and diminish tumoral T cell diversity and function. Liver metastases alter the hepatic immune microenvironment by inducing activated T cell apoptosis *via* the Fas-FasL pathway. Consequently, liver metastases create a systemic immune desert[5].

CURRENT EVIDENCE

In gastric cancer, previous studies evaluating the efficacy of immunotherapy in the setting of liver metastases have shown conflicting results. In a subgroup analysis with a 2-year follow-up from the CheckMate-649, the presence of liver metastases did not impact the rate of response in patients with metastatic gastric cancer treated with immunotherapy[9]. Similarly, findings from the ATTRACTION-2 trial and the ATTRACTION-4 trial demonstrated that the survival benefit of Nivolumab did exist regardless of the status of the liver metastases[10,11]. Contrarily, in the REGONIVO trial, patients with liver metastases had a response rate of approximately 42%, whereas patients without liver involvement had a response rate of 80%[12]. Retrospective studies examining the role of immunotherapy in patients with gastric cancer and liver metastases have yielded mixed results as well. Some studies demonstrated that liver metastasis was associated with a decreased response rate and rapid disease progression, compared to other metastases[13,14], whereas other studies showed no such impact[15].

In the study by Liu *et al*[16] published in this issue of the *World Journal of Gastrointestinal Surgery*, the authors challenged the efficacy of immunotherapy in this group of patients. This study is a small (n = 48) retrospective evaluation of patients with HER2-negative metastatic gastric cancer treated with immunotherapy at a Chinese hospital. The methodology is a simple comparison of two groups of patients (metastatic gastric cancer with or without liver metastasis) across the study outcomes: Objective response rate, disease control rate, progression-free survival (PFS), and overall survival. Although clinical differences were noted between the two groups in all measured outcomes favoring the group without liver metastasis, apart from the PFS, none of the other outcomes showed statistical significance. The study concluded that immunotherapy is less effective in patients with liver metastases than those without.

I commend the authors for their efforts to expand our understanding of the role of immunotherapy for this disease and improve patient selection for this costly and potentially risky treatment. Several issues are worth discussing. Paclitaxel is not a first-line chemotherapy for patients with metastatic gastric cancer. Tirellizumab, an investigational, humanized PD-1 inhibitor, has demonstrated preliminary antitumor activity in hepatocellular carcinoma. It is unclear how this agent was selected as part of the combination regimen as it has not been approved for treating metastatic gastric cancer patients. The study's retrospective design, with its inherited selection bias, especially given the significant difference in baseline performance status and, finally, the small sample size, are additional issues that should be considered when evaluating the study.

While some studies suggest a limited efficacy of immunotherapy in patients with gastric cancer and liver metastases, a broader examination of the literature revealed diverse findings. Other studies counter this notion, demonstrating that the mere presence of liver metastases does not definitively predict poor response to immunotherapy; instead, it underscores the importance of delving into the underlying tumor biology as variation in molecular characteristics and genetic makeup may play a pivotal role in determining the responsiveness of these patients.

CONCLUSION

Throughout history, surgeons have always understood with much clarity that the biology of the tumor dictates prognosis. No better than the late Dr. Blake Clady's famous quotation, "Biology is King," who eloquently illustrated this understanding. However, as another surgical giant, the late Dean Lutin, once said, "We are only at the foothills of understanding cancer, and the biological mountain still lies in the clouds ahead," we are yet to fully understand the biology of tumors. The diverse response to immunotherapy in patients with gastric cancer and liver metastases may be attributed to several underlying tumor biological characteristics such as a tumor microenvironment, immune cell infiltration, and expression of immune checkpoint. Tumors with high levels of immune cell infiltration and increased expression of PD L1 may exhibit an enhanced response to immunotherapy[17].

Additionally, genomic instability, tumor mutational burden, and specific molecular subtypes of gastric cancer can influence treatment outcomes[18-20]. Even more interesting is the revolutionary cutting-edge single-cell omics and spatial transcriptomics technologies, which enabled the exploration of cellular heterogeneity and molecular landscapes of gastric cancer at the single-cell level and revolutionized our understanding of cellular function and tissue organization. These technologies have a promising potential for even more personalized treatment for patients with gastric cancer[21-23]. Therefore, it is not time yet to bid farewell to immunotherapy in this unfortunate group of patients whose prognosis is otherwise dismal. Instead, we need to shift focus toward comprehensive tumor profiling to identify these biomarkers and understand the molecular intricacies of individual cases to tailor more personalized and effective treatment strategies.

FOOTNOTES

Author contributions: Dehal A designed and wrote the paper.

Conflict-of-interest statement: All the authors report no relevant conflicts of interest for this article.

Country of origin: United States

ORCID number: Ahmed Dehal 0000-0002-2918-4769.

S-Editor: Qu XL
L-Editor: A
P-Editor: Cai YX

REFERENCES

1 **Cunningham D**, Starling N, Rao S, Iveson T, Nicolson M, Coxon F, Middleton G, Daniel F, Oates J, Norman AR; Upper Gastrointestinal Clinical Studies Group of the National Cancer Research Institute of the United Kingdom. Capecitabine and oxaliplatin for advanced esophagogastric cancer. *N Engl J Med* 2008; **358**: 36-46 [PMID: 18172173 DOI: 10.1056/NEJMoa073149]

2 **Janjigian YY**, Shitara K, Moehler M, Garrido M, Salman P, Shen L, Wyrwicz L, Yamaguchi K, Skoczylas T, Campos Bragagnoli A, Liu T, Schenker M, Yanez P, Tehfe M, Kowalyszyn R, Karamouzis MV, Bruges R, Zander T, Pazo-Cid R, Hitre E, Feeney K, Cleary JM, Poulart V, Cullen D, Lei M, Xiao H, Kondo K, Li M, Ajani JA. First-line nivolumab plus chemotherapy versus chemotherapy alone for advanced gastric, gastro-oesophageal junction, and oesophageal adenocarcinoma (CheckMate 649): a randomised, open-label, phase 3 trial. *Lancet* 2021; **398**: 27-40 [PMID: 34102137 DOI: 10.1016/S0140-6736(21)00797-2]

3 **Marabelle A**, Le DT, Ascierto PA, Di Giacomo AM, De Jesus-Acosta A, Delord JP, Geva R, Gottfried M, Penel N, Hansen AR, Piha-Paul SA, Doi T, Gao B, Chung HC, Lopez-Martin J, Bang YJ, Frommer RS, Shah M, Ghori R, Joe AK, Pruitt SK, Diaz LA Jr. Efficacy of Pembrolizumab in Patients With Noncolorectal High Microsatellite Instability/Mismatch Repair-Deficient Cancer: Results From the Phase II KEYNOTE-158 Study. *J Clin Oncol* 2020; **38**: 1-10 [PMID: 31682550 DOI: 10.1200/JCO.19.02105]

4 **Ajani JA**, D'Amico TA, Bentrem DJ, Chao J, Cooke D, Corvera C, Das P, Enzinger PC, Enzler T, Fanta P, Farjah F, Gerdes H, Gibson MK, Hochwald S, Hofstetter WL, Ilson DH, Keswani RN, Kim S, Kleinberg LR, Klempner SJ, Lacy J, Ly QP, Matkowskyj KA, McNamara M, Mulcahy MF, Outlaw D, Park H, Perry KA, Pimiento J, Poultsides GA, Reznik S, Roses RE, Strong VE, Su S, Wang HL, Wiesner G, Willett CG, Yakoub D, Yoon H, McMillian N, Pluchino LA. Gastric Cancer, Version 2.2022, NCCN Clinical Practice Guidelines in Oncology. *J Natl Compr Canc Netw* 2022; **20**: 167-192 [PMID: 35130500 DOI: 10.6004/jnccn.2022.0008]

5 **Yu J**, Green MD, Li S, Sun Y, Journey SN, Choi JE, Rizvi SM, Qin A, Waninger JJ, Lang X, Chopra Z, El Naqa I, Zhou J, Bian Y, Jiang L, Tezel A, Skvarce J, Achar RK, Sitto M, Rosen BS, Su F, Narayanan SP, Cao X, Wei S, Szeliga W, Vatan L, Mayo C, Morgan MA, Schonewolf CA, Cuneo K, Kryczek I, Ma VT, Lao CD, Lawrence TS, Ramnath N, Wen F, Chinnaiyan AM, Cieslik M, Alva A, Zou W. Liver metastasis restrains immunotherapy efficacy *via* macrophage-mediated T cell elimination. *Nat Med* 2021; **27**: 152-164 [PMID: 33398162 DOI: 10.1038/s41591-020-1131-x]

6 **Wang C**, Sandhu J, Ouyang C, Ye J, Lee PP, Fakih M. Clinical Response to Immunotherapy Targeting Programmed Cell Death Receptor 1/Programmed Cell Death Ligand 1 in Patients With Treatment-Resistant Microsatellite Stable Colorectal Cancer With and Without Liver

Metastases. *JAMA Netw Open* 2021; **4**: e2118416 [PMID: 34369992 DOI: 10.1001/jamanetworkopen.2021.18416]

7 **Wang X**, Ji Q, Yan X, Lian B, Si L, Chi Z, Sheng X, Kong Y, Mao L, Bai X, Tang B, Li S, Zhou L, Cui C, Guo J. The Impact of Liver Metastasis on Anti-PD-1 Monoclonal Antibody Monotherapy in Advanced Melanoma: Analysis of Five Clinical Studies. *Front Oncol* 2020; **10**: 546604 [PMID: 33117684 DOI: 10.3389/fonc.2020.546604]

8 **Tumeh PC**, Hellmann MD, Hamid O, Tsai KK, Loo KL, Gubens MA, Rosenblum M, Harview CL, Taube JM, Handley N, Khurana N, Nosrati A, Krummel MF, Tucker A, Sosa EV, Sanchez PJ, Banayan N, Osorio JC, Nguyen-Kim DL, Chang J, Shintaku IP, Boasberg PD, Taylor EJ, Munster PN, Algazi AP, Chmielowski B, Dummer R, Grogan TR, Elashoff D, Hwang J, Goldinger SM, Garon EB, Pierce RH, Daud A. Liver Metastasis and Treatment Outcome with Anti-PD-1 Monoclonal Antibody in Patients with Melanoma and NSCLC. *Cancer Immunol Res* 2017; **5**: 417-424 [PMID: 28411193 DOI: 10.1158/2326-6066.CIR-16-0325]

9 **Shen L**, Bai Y, Lin X, Li W, Wang J, Zhang X, Pan H, Bai C, Bai L, Cheng Y, Zhang J, Zhong H, Ba Y, Hu W, Xu R, Guo W, Qin S, Yang N, Lu J, Amaya Chanaga C, Soleymani S, Liu T. P-86 First-line nivolumab (NIVO) plus chemotherapy (chemo) vs chemo in patients with advanced gastric cancer/gastroesophageal junction cancer/esophageal adenocarcinoma (GC/GEJC/EAC): CheckMate 649 Chinese subgroup analysis 2-year follow-up. *Ann Oncol* 2022; **33**: S279 [DOI: 10.1016/j.annonc.2022.04.176]

10 **Kang YK**, Boku N, Satoh T, Ryu MH, Chao Y, Kato K, Chung HC, Chen JS, Muro K, Kang WK, Yeh KH, Yoshikawa T, Oh SC, Bai LY, Tamura T, Lee KW, Hamamoto Y, Kim JG, Chin K, Oh DY, Minashi K, Cho JY, Tsuda M, Chen LT. Nivolumab in patients with advanced gastric or gastro-oesophageal junction cancer refractory to, or intolerant of, at least two previous chemotherapy regimens (ONO-4538-12, ATTRACTION-2): a randomised, double-blind, placebo-controlled, phase 3 trial. *Lancet* 2017; **390**: 2461-2471 [PMID: 28993052 DOI: 10.1016/S0140-6736(17)31827-5]

11 **Kang YK**, Chen LT, Ryu MH, Oh DY, Oh SC, Chung HC, Lee KW, Omori T, Shitara K, Sakuramoto S, Chung IJ, Yamaguchi K, Kato K, Sym SJ, Kadowaki S, Tsuji K, Chen JS, Bai LY, Oh SY, Choda Y, Yasui H, Takeuchi K, Hirashima Y, Hagihara S, Boku N. Nivolumab plus chemotherapy versus placebo plus chemotherapy in patients with HER2-negative, untreated, unresectable advanced or recurrent gastric or gastro-oesophageal junction cancer (ATTRACTION-4): a randomised, multicentre, double-blind, placebo-controlled, phase 3 trial. *Lancet Oncol* 2022; **23**: 234-247 [PMID: 35030335 DOI: 10.1016/S1470-2045(21)00692-6]

12 **Fukuoka S**, Hara H, Takahashi N, Kojima T, Kawazoe A, Asayama M, Yoshii T, Kotani D, Tamura H, Mikamoto Y, Hirano N, Wakabayashi M, Nomura S, Sato A, Kuwata T, Togashi Y, Nishikawa H, Shitara K. Regorafenib Plus Nivolumab in Patients With Advanced Gastric or Colorectal Cancer: An Open-Label, Dose-Escalation, and Dose-Expansion Phase Ib Trial (REGONIVO, EPOC1603). *J Clin Oncol* 2020; **38**: 2053-2061 [PMID: 32343640 DOI: 10.1200/JCO.19.03296]

13 **Sasaki A**, Nakamura Y, Mishima S, Kawazoe A, Kuboki Y, Bando H, Kojima T, Doi T, Ohtsu A, Yoshino T, Kuwata T, Akimoto T, Shitara K. Predictive factors for hyperprogressive disease during nivolumab as anti-PD1 treatment in patients with advanced gastric cancer. *Gastric Cancer* 2019; **22**: 793-802 [PMID: 30627987 DOI: 10.1007/s10120-018-00922-8]

14 **Topp BG**, Thiagarajan K, De Alwis DP, Snyder A, Hellmann MD. Lesion-level heterogeneity of radiologic progression in patients treated with pembrolizumab. *Ann Oncol* 2021; **32**: 1618-1625 [PMID: 34543717 DOI: 10.1016/j.annonc.2021.09.006]

15 **Lin GT**, Liu ZY, Shang-Guan ZX, Zeng GR, Lin JX, Wu J, Chen QY, Xie JW, Li P, Huang CM, Zheng CH. Comparison of the efficacy between immunochemotherapy and chemotherapy in gastric cancer accompanied with synchronous liver metastases: A real-world retrospective study. *Cancer Med* 2023; **12**: 12221-12233 [PMID: 37062073 DOI: 10.1002/cam4.5917]

16 **Liu K**, Wu CX, Liang H, Wang T, Zhang JY, Wang XT. Analysis of the impact of immunotherapy efficacy and safety in patients with gastric cancer and liver metastasis. *World J Gastrointest Surg* 2024; **16**: 700-709 [PMID: 38577087 DOI: 10.4240/wjgs.v16.i3.700]

17 **Ferrata M**, Schad A, Zimmer S, Musholt TJ, Bahr K, Kuenzel J, Becker S, Springer E, Roth W, Weber MM, Fottner C. PD-L1 Expression and Immune Cell Infiltration in Gastroenteropancreatic (GEP) and Non-GEP Neuroendocrine Neoplasms With High Proliferative Activity. *Front Oncol* 2019; **9**: 343 [PMID: 31134150 DOI: 10.3389/fonc.2019.00343]

18 **Lazăr DC**, Avram MF, Romoșan I, Cornianu M, Tăban S, Goldiș A. Prognostic significance of tumor immune microenvironment and immunotherapy: Novel insights and future perspectives in gastric cancer. *World J Gastroenterol* 2018; **24**: 3583-3616 [PMID: 30166856 DOI: 10.3748/wjg.v24.i32.3583]

19 **Kim TS**, da Silva E, Coit DG, Tang LH. Intratumoral Immune Response to Gastric Cancer Varies by Molecular and Histologic Subtype. *Am J Surg Pathol* 2019; **43**: 851-860 [PMID: 30969179 DOI: 10.1097/PAS.0000000000001253]

20 **Liu Y**, Xu Y, Cheng X, Lin Y, Jiang S, Yu H, Zhang Z, Lu L, Zhang X. Research Trends and Most Influential Clinical Studies on Anti-PD1/PDL1 Immunotherapy for Cancers: A Bibliometric Analysis. *Front Immunol* 2022; **13**: 862084 [PMID: 35493449 DOI: 10.3389/fimmu.2022.862084]

21 **Ren L**, Huang D, Liu H, Ning L, Cai P, Yu X, Zhang Y, Luo N, Lin H, Su J, Zhang Y. Applications of single-cell omics and spatial transcriptomics technologies in gastric cancer (Review). *Oncol Lett* 2024; **27**: 152 [PMID: 38406595 DOI: 10.3892/ol.2024.14285]

22 **Li X**, Sun Z, Peng G, Xiao Y, Guo J, Wu B, Li X, Zhou W, Li J, Li Z, Bai C, Zhao L, Han Q, Zhao RC, Wang X. Single-cell RNA sequencing reveals a pro-invasive cancer-associated fibroblast subgroup associated with poor clinical outcomes in patients with gastric cancer. *Theranostics* 2022; **12**: 620-638 [PMID: 34976204 DOI: 10.7150/thno.60540]

23 **Hong Z**, Xie W, Zhuo H, Wei X, Wang K, Cheng J, Lin L, Hou J, Chen X, Cai J. Crosstalk between Cancer Cells and Cancer-Associated Fibroblasts Mediated by TGF-β1-IGFBP7 Signaling Promotes the Progression of Infiltrative Gastric Cancer. *Cancers (Basel)* 2023; **15** [PMID: 37568781 DOI: 10.3390/cancers15153965]

Published by **Baishideng Publishing Group Inc**
7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA
Telephone: +1-925-3991568
E-mail: office@baishideng.com
Help Desk: https://www.f6publishing.com/helpdesk
https://www.wjgnet.com