Article published online: 2021-05-23

Cancer Surgery in Challenging Time of COVID-19 Pandemic – A Pragmatic Approach

Introduction

SARS-CoV-2 virus pandemic has invaded most nations all over the world. Countries which are among the best in health-care infrastructure and resources, too, are struggling to combat the pandemic effectively.

SARS-CoV-2 can spread via cough or respiratory droplets, contact with body fluids, or contaminated surfaces.[1] Recent studies suggest that anyone who is infected with SARS-CoV-2 and is asymptomatic can spread the virus speedily. In this scenario, conventional measures of protection such as face masks provide insufficient protection.[2]

People suffering from cancer are more susceptible to SARS-CoV-2 infection and its complications than non-cancerous patients.[3] Liang W *et al*. found that cancer history represented the highest risk for severe events among all comorbidities that a patient has at the time of getting the infection. In cancer patients who are infected with SARS-CoV-2, the risk of hospital admission for respiratory distress is four times higher and the risk of death ten times higher than in the patients without cancer. This is more marked in cancer patients who have neutropenia or lymphopenia, a feature commonly seen in the patients treated with multiple therapies.[4] This is also due to systemic immunosuppressive state due to cancer and anticancer treatments such as surgery and/or chemotherapy and the risk of nosocomial infections which cancer patients have when they come to the hospital for treatment or routine follow-up.[5-7] Liang W *et al*. found a significantly higher risk of fatality in patients who have a prior history of surgery in the month preceding the infection.[2] They also reported that the condition of cancer patients deteriorated faster than that of the patients without cancer and hence cancer patients should visit the hospital facility only when it is utmost required.

Role and Protection of Health-care Personnel Dealing with Cancer During COVID-19 Pandemic

Today, any person coming to a hospital is presumed "COVID-19 positive unless proven otherwise." Hence, it is imperative that hospital staff should obviate the risk of getting infected or becoming an asymptomatic source of infection from any possible visiting positive patient. Therefore, it is the responsibility of all health-care workers to take adequate precautions for their own safety and safety of others against getting SARS-CoV-2 infection from any visitor to the hospital, may it be the patient or his accompanying attendant.

SARS-CoV-2 can remain viable on common surfaces for days[8] and can infect the operating room personnel when they come in contact with it. SARS-CoV-2 infection also spreads by aerosol predisposing anesthetists to a higher risk of getting the infection while airway access is attempted i.e. intubation, even in an asymptomatic cancer patient harboring the virus. All aerosol generating procedures such as intubation, extubation, bag masking, bronchoscopy, electrocautery, laparoscopy or when body fluids like blood-spill come in contact, increase the risk of transmission of SARS-CoV-2 infection to the entire surgical team. Therefore, the surgeons and the anesthetists are as much at risk of acquiring infection as the first responders. Hence, it is imperative to test for SARS-CoV-2 virus in all patients who are planned for cancer surgery so that extra precautionary measures are taken in positive patients well in advance.

Personal protective equipment (PPE) is the best way to protect health-care workers. The best PPE is a full-body long-sleeved disposable gown, disposable goggles, face shields and tight-fitting facepieces with N-95 or FFP3 respirator leaving no part of the body exposed to aerosolized droplets. These protective devices are required to safeguard the operation theatre personnel against the viral infection. However, scarcity of PPE in developing countries like ours who have limited resources, poses a higher risk to health-care professionals, and therefore, it is very difficult to protect everyone in the OT complex with adequate PPEs. Therefore, in this time of scarcity, PPEs should be provided at least to all those health-care personnel who, in particular, come in direct contact with the virus-infected cancer patients during an invasive procedure and thus become highly vulnerable to coronavirus infection.

The present scenario calls for postponing elective surgeries. However, it is utmost important that cancer patients should receive the required appropriate surgical care in time, depending on both our present scientific knowledge and availability of limited resources in health-care in these testing times.

While cancer treatment, including surgery, is usually of urgent nature and is not an emergency, except at times, adequate measures need to be taken so as to prevent interpersonal exposure of SARS-CoV-2 infection among patients, their attendants, OT personnel and other hospital staff.

Among various options, chemotherapy is one important line of treatment and surgery is another. The option of giving

chemotherapy for operable cancers to avoid doing surgery would expose the patients to immunity-reducing treatment. Repeated visits to the hospital may indeed increase the chances of contracting the said COVID-19 viral infection.

On the other hand, a surgical patient will remain in the hospital for long thus occupying a potential hospital resource that could otherwise be used for a COVID-19 positive or suspected patient. He/she will also be exposed to high-risk COVID-19 infectious hospital environment during his/her long recovery period. Furthermore, enhanced recovery protocol may not be possible in super-major radical cancer surgeries or in situations where a postoperative complication forces the patient to stay for a longer time in the hospital.

Hence, the patients on intravenous chemotherapy could instead be given oral chemotherapy drugs/hormone treatment, wherever possible, so that they have to visit the hospital to the minimum and stay at home during this time of pandemic. The decision to choose oral chemotherapy/hormone treatment over intravenous chemotherapy or surgery should be taken on case-to-case basis after discussion in the tumor board.

Surgical oncologists should discuss the presumed benefit of surgery vis-à-vis risk of interpersonal exposure of SARS-CoV-2 infection. The oncologists should try to do appropriate nonoperative management in these difficult times where it is feasible to do so. However, delaying surgery in all patients during this COVID-19 pandemic period may not be appropriate, especially for early stage cancer patients where curative attempt is the goal.

Hence, wherever possible, preoperative testing for coronavirus positivity can be done, and those patients who test negative can be subjected to surgery with the health-care personnel taking adequate universal biosafety precautions.

Therefore, delay of surgery should be based on the present knowledge and understanding of biology of each cancer. Alternative treatment options could be applied, when appropriate and justifiable, according to the available data. Oral chemotherapy drugs should be preferably used where possible in place of intravenous therapy.

Every institute should preferably have their tumor board meetings or multidisciplinary meetings telephonically or via video conferencing rather than in person to decide about the timing of surgery, chemotherapy or radiotherapy of every cancer patient. The final decision regarding the line of treatment must be made on an individual case-to-case basis with an informed decision by patients and their caregivers. The benefit of cancer treatment should be well assessed over the risk and complications of SARS-CoV-2 infection before taking the final decision.

Telephonic consultation with the patient and his/her family is important so that their hospital visits are minimized during this SARS-CoV-2 pandemic. Reports should be seen online or on WhatsApp without actual visits of patients to the hospital. These steps are required to be taken just for the time being till SARS-CoV-2 infection is eradicated or largely controlled and the patients are able to come to the hospital in a normal way for their routine treatment.

Strategy for Treatment of Cancer Patients During COVID-19 Pandemic

The following strategies could be adopted to treat patients suffering from different kinds of cancers during the prevailing COVID-19 pandemic so that cancer management could be effectively done while minimizing the risk of their exposure to the SARS-CoV-2 virus. However, it is not an air-tight framework but only a suggestive approach which may be adopted with or without modifications, if and where required, keeping in view the status and condition of cancer patients.

Screening, second opinion and regular follow-ups for all cancers

i. All screening procedures and posttreatment follow-ups should be postponed as far as possible till this SARS-CoV-2 pandemic is over or considerably recedes. Patients can be advised telephonically or via WhatsApp or e-mail.

Breast cancer

i. For patients requiring surgeries for benign breast disease, lumps with high-risk atypia and intraductal papillomas, the invasive procedures may be deferred for 3 to 6 months. Also, prophylactic breast cancer surgeries and breast reconstructions should be delayed.
ii. In ductal carcinoma *in situ*, surgery may be delayed. As they are mostly estrogen positive, so they can be started on hormone therapy. Regular monthly follow-ups should be done.
iii. In patients with T1N0 and some T2 or N1 disease who have estrogen receptor positive, progesterone receptor positive and HER-2 negative status, these patients can be started on the neoadjuvant hormone treatment protocol.
iv. Patients with triple negative, HER-2 positive or inflammatory breast cancer may be started on the neoadjuvant chemotherapy protocol.
v. After neoadjuvant chemotherapy, triple negative, HER-2 positive and tumor with >T2 or >N1 should be operated.
vi. Uncontrollable bleeding from fungated breast cancer should be operated. Non-bleeding fungated hormone-positive breast cancer may be managed with hormone therapy and aseptic dressing at home.

Esophagus and gastric cancer

i. Apart from early lesions i.e. T1aN0 which can be treated endoscopically by EMR (endoscopic mucosal resection) or ESD (endoscopic submucosal dissection),

the rest all-stage cancers can be started on neoadjuvant chemoradiation or perioperative chemotherapy. Surgery may be delayed appropriately.

ii. In the absence of bleeding or perforation, the surgery in gastrointestinal stromal tumor (GIST) can be delayed.

iii. Operate immediately, if the patient has presented with bleeding, obstruction or perforation because of tumor mass.

iv. Patients with malignant stricture or esophagogastric obstruction having absolute dysphagia should get feeding jejunostomy.

v. Patients with malignant tracheoesophageal fistula should get covered metallic stenting at the earliest.

Hepato-pancreato-biliary cancer

i. In asymptomatic neuroendocrine tumor (NET), duodenal and periampullary adenomas and GIST, the surgery can be deferred. Symptomatic or medically uncontrolled NET and symptomatic adenomas/GIST causing obstruction or bleeding should be operated upon.

ii. Patients on neoadjuvant chemotherapy can be continued on it if they are responding and tolerating it well, and surgery should be done after 2 to 3 more cycles.

iii. Early operable gallbladder cancer should be operated upon and should not be delayed in view of aggressive nature of the disease.

iv. Neoadjuvant chemotherapy may be started with curative intent in high-risk resectable pancreatic cancers, and surgery can be done after two to three cycles.

v. Hepatocellular carcinoma can be treated with locoregional therapies such as ablation, arterial directed therapies or systemic therapies.

vi. Patients having obstructive jaundice with gastric outlet obstruction (GOO), which is not treatable via endoscopic retrograde cholangiopancreatography (ERCP) and stenting, should be bypassed surgically. In obstructive jaundice without GOO, where ERCP stenting is not possible, percutaneous transhepatic biliary drainage (PTBD) is an option.

Colorectal cancer

i. Surgeries for adenoma, dysplastic polyp and small asymptomatic colorectal carcinoids can be deferred temporarily.

ii. All prophylactic surgeries required for hereditary conditions can be delayed.

iii. Surgery for ulcerative colitis should be delayed if there is no bleeding, perforation or sepsis risk.

iv. Liver-limited oligometastatic disease and locally advanced or recurrent colon cancer requiring exenterative surgery should be treated with downstaging systemic therapy.

v. Neoadjuvant chemoradiation can be considered in rectal cancer. For post chemoradiotherapy rectal cancer patients, one can delay surgery for 10–12 weeks. Rectal cancers which show no or little response after neoadjuvant chemoradiation can be subjected to surgery or chemotherapy.

vi. The operative approach is needed in case of bleeding, obstruction or perforation. In near obstructing colorectal cancer where stenting is not possible, the surgery should be done on emergency basis.

vii. For bleeding rectal cancers, palliative dose radiotherapy can be used as an alternative to surgical management.

Endocrine and neuroendocrine cancer

i. Most of the endocrine malignancies can be delayed except those threatening life or having severe symptoms which are not getting relieved with medication. All cancers with aggressive biology such as anaplastic carcinoma and pheochromocytoma should be treated with surgery, if possible and needed.

ii. Tracheostomy can be done as a life-saving procedure for advanced thyroid cancer invading or compressing tracheal lumen.

iii. Medically uncontrolled life-threatening hypercalcemia from hyperparathyroidism and symptomatic Cushing syndrome should be treated surgically, if indicated.

iv. Surgery for small bowel NETs can be delayed except when they are causing severe pain, hemorrhage or obstruction.

Sarcoma and bone tumors

i. Aggressive chest wall tumor, pathological fractures, aggressive benign tumors such as giant cell tumor and all high-grade sarcomas should be operated at the earliest.

ii. For truncal or retroperitoneal liposarcomas and for most low-grade sarcomas, the surgery can be deferred for some time.

iii. Nonmetastatic soft-tissue extremity sarcoma should be operated at the earliest.

iv. For patients having a recurrent disease with high chances of long-term disease control, surgery should be offered immediately.

v. All localized Osteosarcomas and Ewing sarcomas should be operated as planned after neoadjuvant chemotherapy.

vi. Local surgery of metastatic bone tumor can be delayed, and surgery can be replaced with radiotherapy for local control.

vii. Surgery of low-grade chondrosarcoma of the bone can be delayed.

Gynecological cancer

i. Cervical cancer can be treated with radiation or chemoradiation or chemotherapy depending on the stage of the disease.

ii. Ovarian cancer should be treated on routine lines as per the guidelines, as a delay can cause harm. For advanced cancers, neoadjuvant chemotherapy can be continued in

patients showing good response, and debulking surgery can be done after the completion of chemotherapy.

iii. Endometrial cancer and vulvar cancer should be operated upon.

iv. For loop electrosurgical excision procedure, conization or excision of *in situ* lesions, and uniloculated ovarian cyst or dermoid cyst, the surgery can be delayed.

Genitourinary cancer

i. Urinary bladder cancer can be treated with neoadjuvant chemotherapy and timely surgery thereafter.

ii. Locally advanced prostate cancer can be treated with external beam radiotherapy and/or androgen deprivation therapy (ADT). Medical castration should be used in place of bilateral orchiectomy as a part of ADT for metastatic prostate cancer.

iii. Testicular, penile and nonmetastatic renal cancer should be surgically treated at the earliest.

iv. Palliative nephrectomy can be attempted for alarming tumor bleeding which is not controlled with noninvasive method and/or angio-embolization.

v. Metastatic renal cancer should be treated with oral tyrosine kinase inhibitors, and cytoreductive nephrectomy should be avoided.[9]

Head and neck cancer

i. Small lesions of head and neck can be treated with radiation or chemoradiation.

ii. Head and neck cancers should be properly assessed. Life-threatening and aggressive cancers should be operated, if possible, to prevent vital structure invasion.

Melanoma

i. In margin-negative *in situ* melanoma resection, formal wide local excision can be delayed.

ii. Partially resected lesions should be operated upon preferably in an outpatient setting.

iii. Stage III and Stage IV patients can be started on chemotherapy.

Most important of all, the above suggestions should be thoroughly discussed and decided in tumor board meetings through telephone or video conferencing before offering them to the patient. A personalized and customized approach for minimizing cancer-related morbidity and reducing the risk of exposure to SARS-CoV-2 is required during this difficult period. More guidelines from ICMR (Indian Council of Medical Research), NCCN (National Comprehensive Cancer Network), ACS (American College of Surgeons), ASCO (American Society of Clinical Oncology), ESMO (European Society of Medical Oncology) and other tertiary cancer institutes can enlighten the oncology fraternity to treat cancer patients in a better way during these challenging times of SARS-CoV-2 pandemic.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

Shubh Mahindru[1], Chandan K Das[2], Amol Patel[3], Prashant Mehta[4], Bivas Biswas[5], Atul Batra[6], Arnab Bandhopadhyay[7]

[1]Department of Surgical Oncology, Ivy Hospital, S.A.S. Nagar, Punjab, India, [2]Regional Cancer Centre, Post Graduate Institute of Medical Education and Research, Chandigarh, India, [3]Department of Medical Oncology, Malignant Diseases Treatment Centre, Army Hospital Research and Referral, New Delhi, India, [4]Department of Medical Oncology/ Hematoncology and BMT, Asian Institute of Medical Sciences, Faridabad, Haryana, India, [5]Department of Medical Oncology, Tata Medical Centre, Kolkata, West Bengal, India, [6]Department of Medical Oncology, AIIMS, New Delhi, India, [7]Department of Oncosurgery, Command Hospital Eastern Command, Kolkata, West Bengal, India

Address for correspondence: *Dr. Shubh Mahindru, Department of Surgical Oncology, Ivy Hospital, Sector 71, S.A.S. Nagar, Punjab, India. E-mail: dr.shubh@gmail.com*

Submitted: 01-Apr-2020
Revised: 17-Apr-2020
Accepted: 19-Apr-2020
Published: 26-May-2020

References

1. Fuk-Woo Chan J, Yuan S, Kin-Hang K, Kai-Wang To K, Chu H, Yang J, *et al*. A familial cluster of pneumonia associated with the 2019 novel coronavirus indicating person-to-person transmission: A study of a family cluster. Lancet 2020;395:514-23.
2. Chang D, Xu H, Rebaza A, Sharma L, Dela Cruz CS. Protecting health-care workers from subclinical coronavirus infection. Lancet Respir Med 2020;8:e13.
3. Liang W, Guan W, Chen R, Wang W, Li J, Xu K, *et al*. Cancer patients in SARS-CoV-2 infection: A nationwide analysis in China. Lancet Oncol 2020;21:335-7.
4. Bitterman R, Eliakim-Raz N, Vinograd I, Zalmanovici Trestioreanu A, Leibovici L, Paul M. Influenza vaccines in immunosuppressed adults with cancer. Cochrane Database Syst Rev 2018;2:CD008983.
5. Kamboj M, Sepkowitz KA. Nosocomial infections in patients with cancer. Lancet Oncol 2009;10:589-97.
6. Li JY, Duan XF, Wang LP, Xu YJ, Huang L, Zhang TF, *et al*. Selective depletion of regulatory T cell subsets by docetaxel treatment in patients with nonsmall cell lung cancer. J Immunol Res 2014;2014:286170.
7. Longbottom ER, Torrance HD, Owen HC, Fragkou PC, Hinds CJ, Pearse RM, *et al*. Features of postoperative immune suppression are reversible with interferon gamma and independent of interleukin-6 pathways. Ann Surg 2016;264:370-7.

8. van Doremalen N, Bushmaker T, Morris DH, Holbrook MG, Gamble A, Williamson BN, *et al*. Aerosol and surface stability of SARS-CoV-2 as compared with SARS-CoV-1. N Engl J Med 2020;382:1564-7.
9. Méjean A, Ravaud A, Thezenas S, Colas S, Beauval JB, Bensalah K, *et al*. Sunitinib alone or after nephrectomy in metastatic renal-cell carcinoma. N Engl J Med 2018;379:417-27.

Access this article online

Quick Response Code:

Website: www.ijmpo.org

DOI: 10.4103/ijmpo.ijmpo_121_20

How to cite this article: Mahindru S, Das CK, Patel A, Mehta P, Biswas B, Batra A, Bandhopadhyay A. Cancer surgery in challenging time of COVID-19 pandemic – A pragmatic approach. Indian J Med Paediatr Oncol 2020;41:144-8.