

ORIGINAL ARTICLE

COVID-19 Pandemic: Challenges, Impacts and Dilemmas in Surgical Oncology (Descriptive Longitudinal Study)

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ABSTRACT

Background: The oncologic surgery patients constitute a highly susceptible group during COVID-19 pandemic.

Aim: To determine how the COVID-19 pandemic affected the cases of surgical oncology, their frequency with reference to the pre-pandemic era and the challenges faced in general and in their management during the pandemic.

Methodology: we conducted a descriptive longitudinal study, using consecutive non-probability sampling technique, estimating the number of cancer cases in our center, their management protocols keeping in view the local and international guidelines, resource availability and how the pandemic affected the dynamics of cancer surgery.

Results: we received a total of 63 cancer cases from 1st march-31st august 2020, between age groups 29-70 years. 40 patients out of those 63 presented with complications and received early definitive surgery, where surgery could not be deferred due to the course of disease or complications. Rest of the 20 patients received either neoadjuvant chemotherapy, a palliative procedure or chemoradiotherapy, 2 patients tested COVID-19 positive, 1 non-cancer related mortality. We received 63 patients during our 6 months study time, compared with a total of 156 cancer cases received during the pre-pandemic 6 months period, showing significant decrease in frequency of cancer cases.

Conclusion: Cancer cases with a chance of upgradation of disease stage due to delay or those complicated with obstruction or bleeding could not be deferred. Mandatory PCR COVID-19 testing of every admitted patient with a repeat test 48-72 hours before surgery. Early referral to corona care center if patient tests positive. Discussion of every case in MDM prior to decision making. Operating every case with complete SOPs.

Keywords: COVID-19, surgical oncology, pandemic

INTRODUCTION

Coronaviruses account for a set of different viruses; although new to many, have caused minor outbreaks in the history ranging from common cold to SARS¹ (severe acute respiratory syndrome) in 2003 and MERS¹ (middle east respiratory syndrome) in 2012. Catching attention worldwide in the beginning of 2020 when it was declared a pandemic on 11th of March¹; it causes symptoms² ranging from respiratory², gastrointestinal³, renal⁴, neurological⁵ still continuing to surprise the human race with ever new discoveries what this microscopic being is capable of. Spreading at such a pace within a span of few months, it jeopardized the healthcare system worldwide. Major bulk of the health resources are now directed towards its management.

The first case of COVID-19 appeared in Pakistan⁶ on 26th of February 2020, since then the trends of daily cases is only rising⁷. Our healthcare system faced very many challenges in tackling the situation from constructing screening protocols, to establishing dedicated corona care centers and devising a proper referral channel and safety protocols for the health care workers. It impacted all the fields in medicine and surgery. We have seen a global change in schemata regarding management of surgical patients, prioritizing emergency surgeries and surgical

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oncology cases and delaying elective procedures. The oncologic surgery patients constitute a highly susceptible group during COVID-19 pandemic. Putting these patients at risk of exposure to the virus from repeated hospital visits, diagnostic delays due to the current pandemic situation, understanding the disease course with regard to COVID-19, risks with aerosol generating procedures, outcome of modified strategies in dealing with surgical oncologic cases; the dilemmas in the management of such patients remain whatsoever.

The American College of Surgeons⁸ divided the decision making regarding surgical oncology patients in relation to the three phases in which any hospital resided as far as its resources, availability of ICU care and ventilator facilities was concerned. Phase-I, semi urgent setting (preparatory phase) where few COVID-19 patients were in the hospital and ICU care and ventilator facility were still available. In phase-II urgent setting, where more COVID-19 patients were being catered and there were limited resources and phase-III in which all the hospital resources, ICU care was directed towards the COVID-19 patients. In the initial phases with less load of COVID-19 more cancer surgeries requiring ICU care could be performed but with the increasing number of cases more and more resources were channeled towards COVID-19 patients, deferring the oncologic surgery cases for neoadjuvant chemotherapy or radiotherapy or any other

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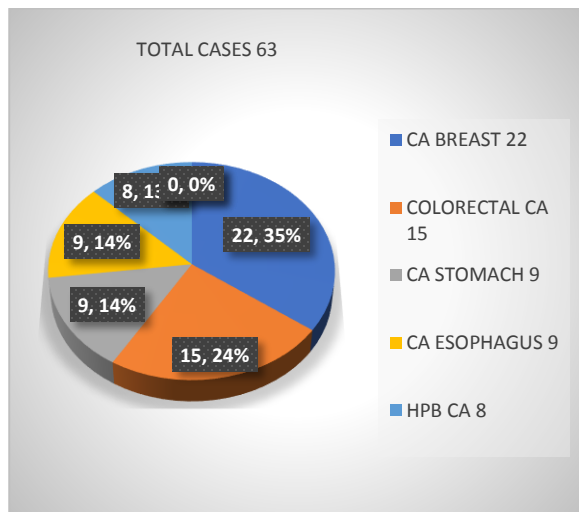
palliative procedure where the disease progression favored, until the pandemic settled. The aim of the study is to determine effects of COVID-19 pandemic on the frequency of surgical oncology cases with reference to the pre-pandemic era and the challenges faced in their management.

MATERIALS AND METHODS

Still residing in the phase-I of the pandemic we conducted a descriptive longitudinal study with approval from institutional ethical committee starting from 1st March-31st August 2020 using consecutive non-probability sampling technique at our center on oncologic surgery cases, their frequency compared to the past 6 pre-COVID months, COVID-19 status, management protocols keeping in view the local and international guidelines, resource availability, and how the pandemic effected different lines of cancer surgery. All cancer cases received at our center during the study period were included regardless of their age, gender, co-morbidities and cancer line. All the cases that were diagnosed at our center but preferred to receive treatment at a government hospital due to resource constraints were excluded.

RESULTS

we received a total of 63 cancer cases from 1st march-31st august 2020, between age groups 29-70 years with mean age 53.90 ± 9.64 and 44 female and 19 male patients. Among these cases were 22 CA breast, 15 colorectal cancer, 9 CA stomach, 9 CA esophagus, 8 HPB CA. Construction of COVID-19 screening protocols were underway during the first month of pandemic, so COVID-19 status of all 10 patients received in march was unknown. From 1st April screening of every patient with COVID-19 PCR test was made mandatory admission criteria, with a repeat test at least 48-72 hours preoperatively. Out of the rest of 63 cases 2 tested positive with no obvious symptoms and a timely referral was made to the corona care/isolation center where management of other ailments ran hand in hand with that of COVID-19.



Out of 22 cases of CA breast 17 were early breast cancer one of which tested COVID-19 positive and was referred to corona isolation center, rest of 16 patients underwent definitive surgical procedure with adjuvant chemoradiotherapy (CRT) post operatively. 5 patients were advanced breast cancer, all 5 received palliative treatment.

Fifteen cases of colorectal cancer were received 1 of which tested COVID-19 positive and was referred for isolation and subsequent care at designated corona care hospital, 5 patients of CA rectum presented with obstructive symptoms, all 5 received a definitive surgical procedure, showed good recovery with favorable outcomes and were sent for post-operative CRT. 5 cases of CA colon presented with obstructive symptoms, received definitive surgery; with post-operative referral for adjuvant chemotherapy. 3 patients had carcinomatosis peritonei and were sent for palliative chemotherapy. Diversion ileostomy was performed on 1 patient with advanced metastatic rectal cancer with referral for palliative chemotherapy afterwards.

Ca breast total cases	22
MRM level ii axillary clearance	16
Palliative toilet mastectomy	2
Advanced disease palliative chemo	3
Covid-19 PCR +ive	1

Colorectal cancer total cases	15
Right hemicolectomy (ca ascending colon/hepatic flexure)	4
With carcinomatosis peritonei palliative chemotherapy	3
Apr (low rectal tumor)	3
Anterior resection (high rectal tumor)	2
Left hemicolectomy (ca descending colon)	1
Covid-19 pcr +ive	1
With mets palliative diversion ileostomy	1

9 cases of gastric carcinoma were received, out of which 7 were high grade early gastric cancer, underwent definitive surgery. One case was biopsy proven GIST with hepatic metastasis who was sent for imatinib therapy. 1 mortality, with advanced gastric CA and had multiple co-morbid, with cancer complicated by bleeding and obstruction was up for endoscopic stenting.

Ca stomach total cases	9
Total gastrectomy	6
Wedge resection	1
Gist with hepatic mets sent for chemotherapy	1
Non-cancer related mortality	1

All 9 cases of esophageal cancer had locally advanced disease and presented with dysphagia, underwent feeding jejunostomy before referral for neoadjuvant chemotherapy.

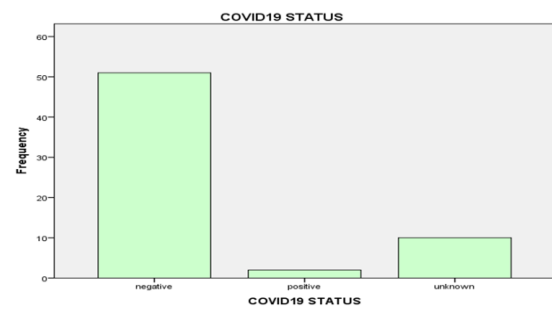
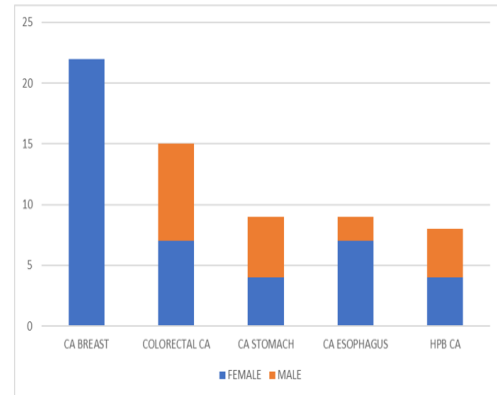
Ca esophagus total cases	9
Palliative feeding jejunostomy	9

8 cases of HPB cancer. 7 underwent definitive surgical procedure, 1 was advanced case and only a palliative SEMS (self-expanding metallic stent) was placed endoscopically.

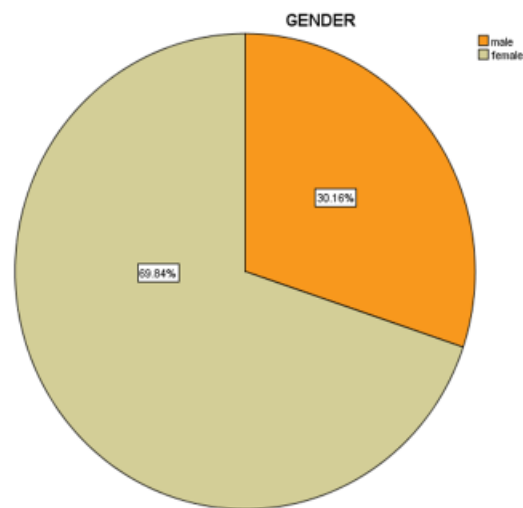
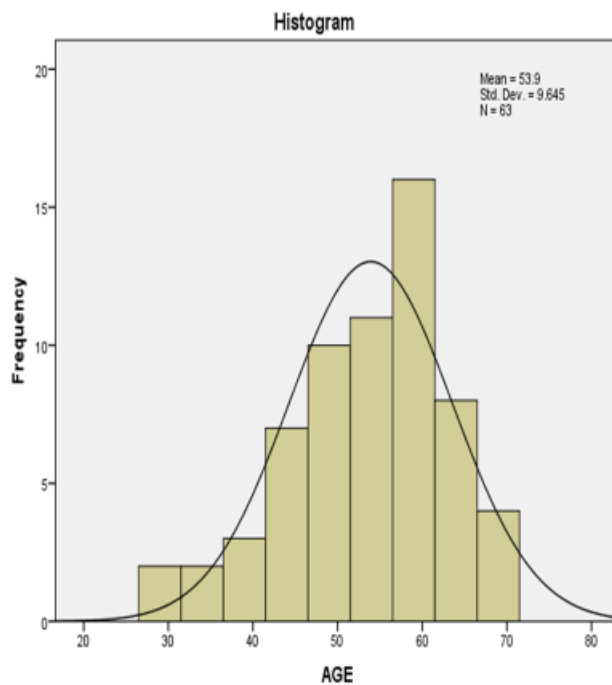
HPB Ca total cases	8
Whipple's procedure	5
Distal pancreatectomy	2
Advanced pancreatic head tumor endoscopic sems placed	1

Decision of every case was made after discussion in MDT meetings held online. 40 patients received definitive surgery with postoperative CRT, 20 patients received either neoadjuvant chemotherapy or palliative surgery or chemoradiotherapy, 2 patients tested COVID-19 positive, 1 non-cancer related mortality. 156 cancer patients were received in the past 6 pre-pandemic months compared to the 63 patients received during our 6 months study time. A significant reduction in the frequency of any cancer case was noted in relation to the past 6 pre-pandemic months, showing significant effect of the pandemic on all lines of cancer cases.

TABLES AND FIGURES



- Staff tested only when symptomatic. Only 2 doctors tested positive during the study duration.



Diagnosis	Treatment	Outcome
Breast carcinoma-22	16 Early breast cancer-MRM e level II AC 5 Advanced breast cancer-Palliation 3 CRT 2 toilet mastectomies 1 COVID-19 PCR +ive	Adjuvant CRT Palliative CRT Referral
Colorectal carcinoma-15	10 With complications-definitive surgery 4 Rt. Hemicolectomy 3 APR 2 Anterior resections 1 Lt. Hemicolectomy 4 Metastatic Disease-Palliation 3 Carcinomatosis peritonei-Chemo 1 diversion ileostomy 1 COVID-19 PCR +ive	Adjuvant CRT Palliative CRT Referral
Gastric carcinoma-9	7 with complications-definitive surgery 6 total gastrectomy 1 wedge resection 1 GIST with hepatic mets-imatinib therapy 1 Non-cancer related mortality	Adjuvant CRT Imatinib therapy
Esophageal carcinoma-9	All 9 locally advanced-feeding jejunostomy	Neoadjuvant CRT
HPB cancer-8	7 cases-definitive surgery 5 whipple's procedure 2 distal pancreatectomies with splenectomy 1 Advanced Disease-Endoscopic SEMS	Adjuvant CRT Palliative CRT

DISCUSSION

the surge of COVID-19 cases in the world rose markedly in early march 2020, whereby it was declared as a pandemic. During the first month of the research our center was faced with the ultimate battle of laying out a system in order to keep both the healthcare providers and the patients safe from the ongoing viral outbreak. The idea was to triage⁹ the patients in a separate area and then referring those with the red flags to properly devised corona care centers where the management of other ailments ran side by side with that of the COVID-19. By April 2020 COVID-19 PCR testing of every admitted patient was made mandatory, keeping patients in a separate area till their test results were reported. Surgical procedures were limited to only emergency surgeries and those of the surgical oncology¹⁰. COVID-19 testing at least 48-72 hours¹¹ before the procedure was made part of the pre-operative assessment. As false negativity of the COVID-19 PCR test was reported as high as 30%¹² every case was dealt as positive in the operating room (OR) regardless of their COVID-19 status, ensuring all protective measures and limiting OR staff.

Aerosol generating procedures¹³ posed a possible risk for the spread of virus with very little research available in the beginning. According to a study¹⁴ published in NEJM COVID-19 remains viable in aerosols for 3 hours and survives on stainless steel and plastic for up to 72 hours, implying possible risk of contamination of OR after any procedure.

Understanding the virus and its symptoms with regard to the oncology patients was a huge challenge. The European Society of Medical Oncology (ESMO)¹⁵ proposed a different course of treatment for all oncology cases to minimize risk exposure. Chemotherapy regimens were changed from 6 weeks to 4 weeks and from intravenous to oral or subcutaneous routes where ever favorable. If a patient tests positive, continue systemic anticancer treatment (SACT) if it is vital for urgent control of cancer,

defer treatment until one test comes negative if the course of the disease allows.

Likewise, surgical oncology practices were also modified, different surgical oncology societies like American College of Surgeons (ACS), Society of Surgical Oncology (SSO), European Society of Surgical Oncology (ESSO) proposed a modified strategy in management of such patients with regard to the pandemic in order to minimize hospital visits yet not compromising on standard cancer care. Keeping a multidisciplinary approach still a base in decision making of every case, each patient was discussed in the MDM and a decision was made if the patient needs an upfront surgery or if it can be deferred. In reference to a few commonly occurring malignancies at our center with regard to the modified strategies according to ACS, SSO, NCCN¹⁶

The highest number of cases we received were of breast cancer, the top most common cancer in female population. Majority of them were early breast cancer and were operated upon keeping in view the modified guideline. Different oncologic societies¹⁶ advocated either neoadjuvant chemotherapy or hormonal therapy for 3-5 months before advancing towards surgery in late-stage breast cancer, keeping a very close follow up all the while. Any progression of the disease would prompt towards operative management.

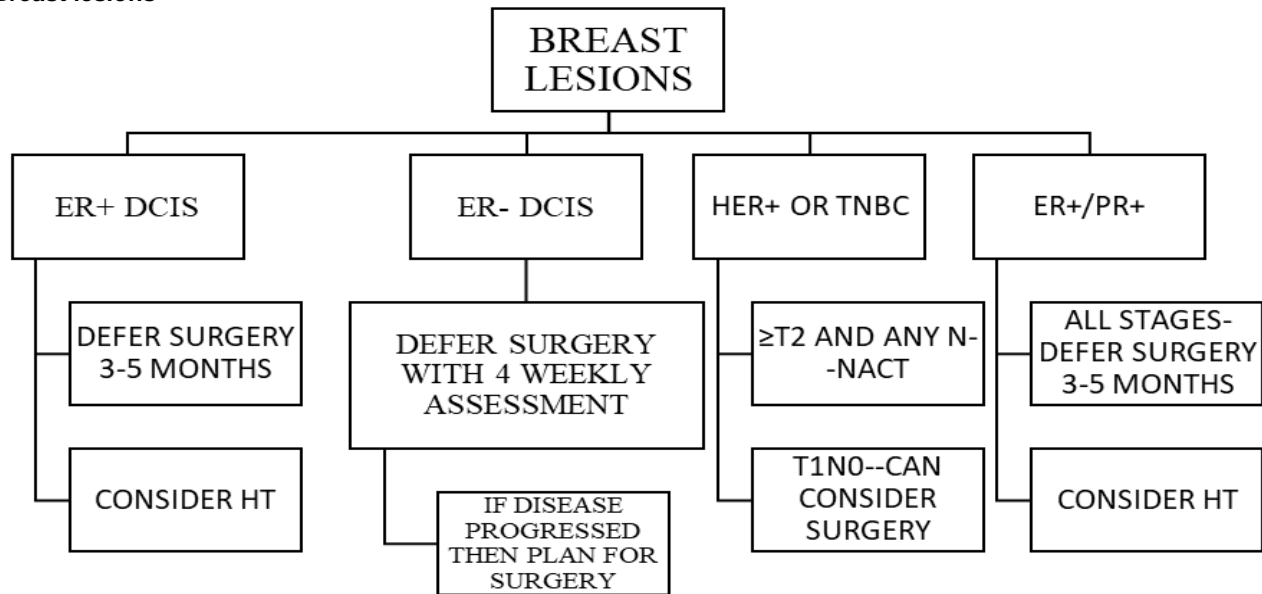
Colorectal cancer formed the second largest bulk of oncologic patients that were received. This was the group where serial endoscopies would suffice for cancers with an early stage and low grade thus limiting hospital visits, as the bulk of COVID-19 cases increased at our institute. A clinical trial by the name of FOxTROT¹⁷ demonstrated very favorable outcomes with neoadjuvant chemotherapy in patients with locally advanced rectal carcinoma resulting in downstaging of the tumor and decrease rate of subsequent inadequate resections. This was the window that we could utilize in such patients during the pandemic and defer

surgery with known beneficial outcomes. But the problem faced here was that majority of cases presented with complications either bleeding or obstruction, warranting upfront surgery and the rest included patients with advanced metastatic disease where only a palliative treatment could be offered.

Gastroesophageal cancer formed the subsequent largest group, fortunately all the patients with esophageal carcinoma were a candidate for neoadjuvant chemotherapy before proceeding with definitive surgery. All nine patients received palliation with feeding jejunostomy and were sent

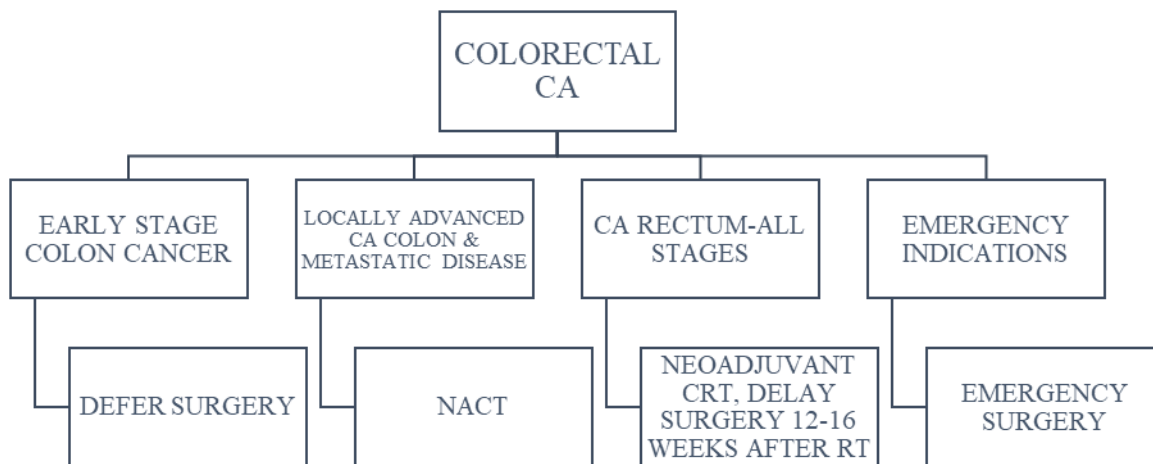
for neoadjuvant CRT. This helped in diverting these patients to centers that dealt entirely with oncologic cases at a time when the first wave of pandemic was its peak. Gastric carcinoma patients were not as fortunate and most of them presented with complications where surgery was the mainstay of treatment. All but one case of pancreatic tumor was resectable; the one with advanced disease was offered a palliative self-expanding metallic stent endoscopically to help with the obstructing symptoms.

Breast lesions¹⁶



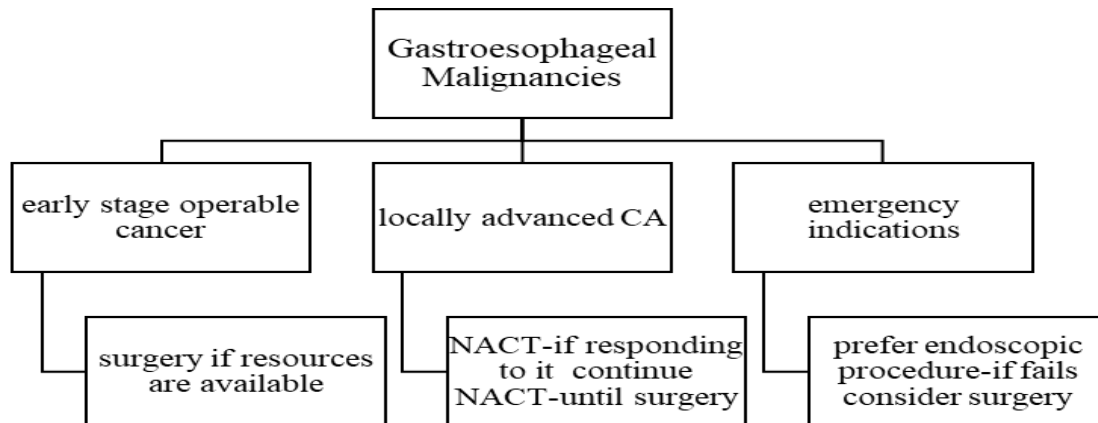
(ER: estrogen receptor; PR: progesterone receptor; DCIS: ductal carcinoma in-situ; NACT: neoadjuvant chemotherapy; HT: hormonal therapy; TNBC: triple negative breast cancer)

Colorectal carcinoma¹⁶

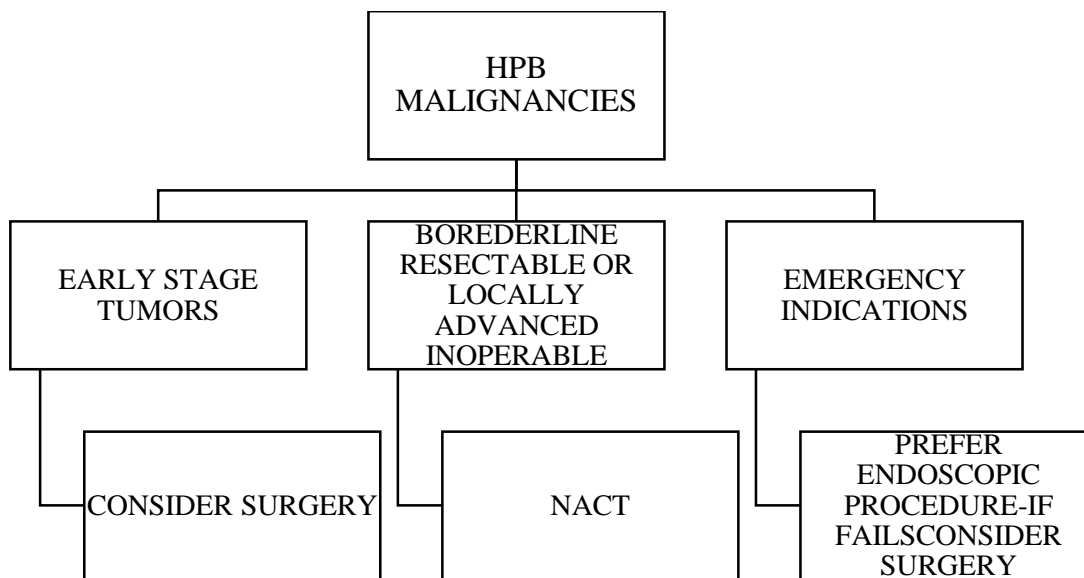


(NACT: neoadjuvant chemotherapy; CRT: chemo-radiotherapy)

Gastro-esophageal malignancies¹⁶



HPB malignancies¹⁶



The major trouble in managing the surgical oncology group during the pandemic was the lack of local guidelines and resource unavailability in part of the institute and also of the patients. Every case we received was discussed in MDT meetings held online, choosing the best possible management option for each patient. Malignancies in general had a certain advantage where surgery could be deferred if detected on an early stage¹⁸ or if a few additional investigations were carried out, unfortunately both of these benefits could not be availed in our country where healthcare facilities came at a price. Majority of the cases we received were either locally advanced or complicated.

Many of the centers including ours withheld carrying out certain investigations/procedures that were done routinely and were vital in diagnosing different cancer lines. This included FNAC or tru-cut biopsy, endoscopies²⁰ or colonoscopies; the main concern being very limited data available initially on the mode of spread of the virus. This put the patients in extensive ordeals in having their case diagnosed, compromising that vital window where the best possible management could be provided to them. A UK

based study²¹ noted a significant increase in number of avoidable cancer-related deaths and an expected further increase in this number due to diagnostic delays imposed by the nationwide lockdown.

Looking at the declining numbers of oncologic surgery cases during the pandemic it was made a healthy practice to encourage the patients not to wait in seeking help under certain circumstances, explaining the red flags of commonly received malignancies at our center. And making telephonic contact and follow up where ever possible.

CONCLUSION

Cancer cases with a chance of upgradation of disease stage due to delay or those complicated with obstruction or bleeding could not be deferred. Mandatory PCR COVID-19 testing of every admitted patient with a repeat test 48-72 hours before surgery. Early referral to corona care center if patient tests positive. Discussion of every case in MDM prior to decision making. Operating every case with complete SOPs.

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