



Elective Surgical Experience During COVID Pandemic at a Tertiary Cancer Care Centre in India: A Retrospective Analysis

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Abstract

To analyse and identify possible outcomes of elective cancer surgeries performed at a tertiary cancer centre during COVID19 pandemic. This is a retrospective study including patients that underwent surgery at HCG Manavata cancer centre, Nashik, Maharashtra, India, from 15 March 2020 to 15 June 2020. Among the 458 patients that underwent elective surgeries, 54% were male and 46% were female, with a median age of 50.57 years. The most common sites of cancer distribution were head and neck (24.67%), colorectal (11.57%), gynaecological (11.35%), and breast (10.26%). Of the included patients, 92% were of American Society of Anaesthesiologists (ASA) II with comorbidities such as hypertension, and 64% underwent major surgeries with a mortality rate of 1.52% ($n=7$). Average duration of surgery and hospital stay was observed to be 168.43 min and 4.4 days, respectively. Post-operatively, 7 patients were tested COVID positive and their recovery was uneventful. Despite the difficulty that set in because of COVID19 pandemic, it was proven from our study that elective cancer care surgeries can be successfully performed by following all the set guidelines.

Keywords Elective cancer surgery · Cancer care · COVID19 · Pandemic · Tertiary cancer care · Retrospective analysis

Introduction

The outbreak of novel coronavirus disease 2019 (COVID-19) is of international concern deeming the World Health Organisation (WHO) to declare it as pandemic on 11 March 2020 [1]. By the end of 10 November 2020, India has reported 8,591,730 cases, of which 7,963,457 cases were cured and 127,059 were dead [2]. In 2018, around 2.25 million people were estimated to have cancer in India with more than 11 lakh new cases every year with an estimated death rate of > 7.5 lakh patients per year [3].

In general, immune system of an individual with cancer is often weak and fragile, placing them at an increased risk to other conditions [3]. No age is immune for malignant disease but majority of the cancer patients belong to elderly age group, prevalence of other comorbidities makes them more susceptible for contracting infectious diseases. Administration of chemotherapeutic drugs to an individual suffering from cancer also diminishes/alters their immune response, making them much more susceptible to infections [4].

India has grown as a top healthcare destination for patients around the world seeking world-class treatment at an economical price [4]. The strict lockdown, travel restrictions and increase in COVID cases over the months have created a panic situation in both domestic and international cancer patients. In view of COVID19 transmission, hospitals have limited their surgical procedures to a larger extent except for the selective emergency procedures, posing a high risk in non-critically ill cancer patients [5]. To regulate and avoid any serious consequences in view of COVID pandemic and national lockdowns, various national and international cancer societies and national

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authorities such as American Society of Clinical Oncology (ASCO), American college of surgeons (ACS), British Association of Surgical Oncology (BASO), European society of surgical oncology (ESSO), National Comprehensive Cancer Network (NCCN), and society of surgical oncology (SSO) have recommended multiple changes in surgical procedures and treatment strategies [6–12]. Cancer hospitals around the world started following a triage system for handling patients waiting for cancer surgeries [13]. Elective surgical procedures were prioritised and performed as decided by a multidisciplinary team (MDT) on a case-to-case basis, which will impart greater benefit for patients [14].

The aim of the present study was to analyse and identify the possible outcomes of such elective cancer resections performed during the pandemic in a classified red zone (Maharashtra, India) [15]. Our secondary aim was to identify the possible complications and consequences followed by these elective cancer surgeries for better understanding of surgeons and health care workers working around the world in cancer care.

Material and Methods

Patient Screening and Selection

In this retrospective study, data of patients who underwent elective cancer surgeries at HCG Manavata cancer centre from 15 March 2020 to 15 June 2020 was collected and analysed. All the patients underwent elective surgeries on a priority basis depending on their age, stage of cancer, Eastern Cooperative Oncology Group (ECOG) status, American Society of Anesthesiologists (ASA) classification [16], comorbidities, and potentiality to cure. Pre-operative COVID test was mandated following any of the methods recommended by the Indian Council of Medical Research (ICMR), India [17].

Data Collection and Analysis

The patient's information such as socio-demographic profile, clinical history, perioperative and postoperative parameters were collected, classified, and categorised retrospectively from the hospital's telephonic and electronic medical records. The institutional ethical committee has cleared study from all the required ethical approvals. Descriptive statistical analysis was performed to present the data using Statistical Package for the Social Sciences version 22 (IBM SPSS Statistics version 22.0, IBM Corp., USA).

Results

Of the 458 patients that underwent elective surgeries, 54% were male and 46% were female with a mean age of 50.75 years. The mean duration of surgery and stay in hospital were 168.43 min and 4.40 days, respectively. Most of the patients in our study were of ASA grade II (92%), and 93 patients had pre-existing comorbid condition/disease such as hypertension (53.76%), diabetes mellitus (21.50%), and hypertension with diabetes mellitus (15.05%) as shown in Table 1. Two ninety-two patients underwent major surgeries and organ site distribution is depicted in Fig. 1, where head and neck cancer constituted 24.67% followed by colorectal (11.57%), gynaecological (11.35%), breast (10.26%) and urological (9.60%; Fig. 1).

As shown in Fig. 2, 41 out of 458 patients had unexpected postoperative events, which were major (56%) as per Clavien–Dindo classification. Using Clavien–Dindo grades, the severity of postoperative complications were classified as grade I [13 (32%)], grade II [10 (24%)], grade IIIA and IIIB [7 (17%)], grade IV [4 (10%)] and grade V [7 (17%)] [18]. Post-surgery, 7 patients and 2 surgical ward staffs who were in contact with patients were tested positive for COVID.

Table 1 Patients sociodemographic characteristics, clinical classification, surgical categorisation, and comorbidities ($n=458$)

Gender	
Male	247
Female	211
Age (years in average)	50.74
ASA classification	
II	423
III	35
Surgical category	
Major	292
Minor	166
Duration of surgery (Average time in min)	168.43
Hospital stay (Average in days)	4.40
Comorbidities	
HTN	50
DM	20
HTN with DM	14
IHD	4
HTN IHD	2
Parkinsonism with DM	2
PEM	1

ASA Physical Status Classification System II and III – A patient with mild and severe systemic disease (14); *HTN*, hypertension; *DM*, diabetes mellitus; *IHD*, ischemic heart disease; *PEM*, protein energy malnutrition

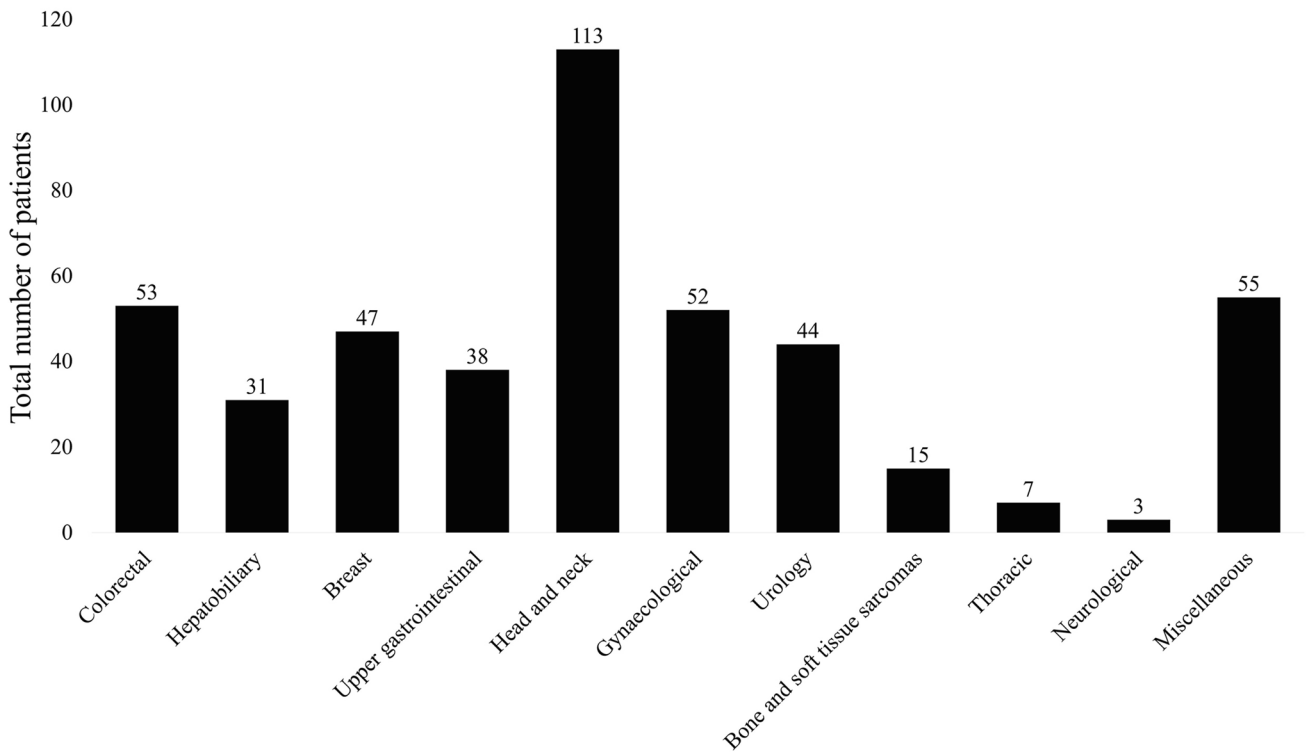


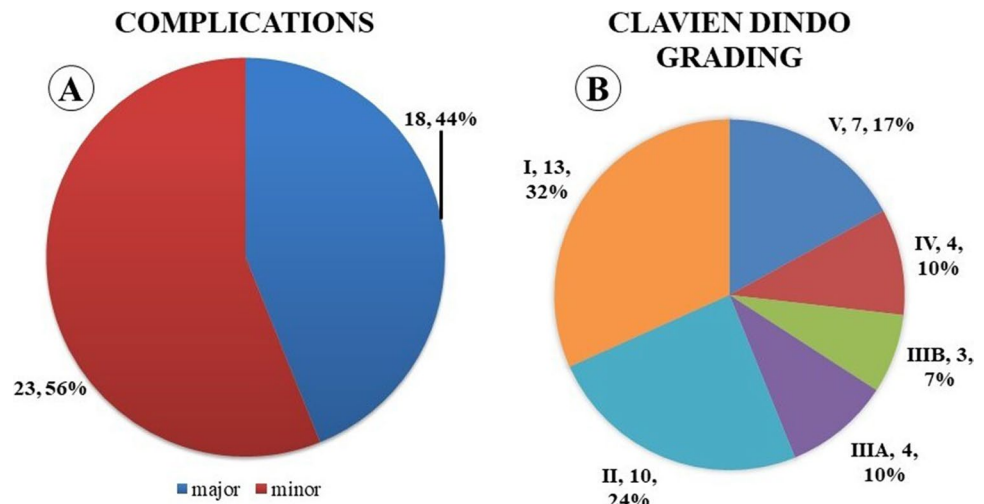
Fig. 1 Organ site based distribution of cancer in study population underwent elective cancer surgeries

Major complications in age group <60 years and >60 years were found to be 2.76% and 7.6% ($P=0.026$), respectively. The mortality rate between the two age groups <60 years and >60 years was found to be 4% and 3%, respectively. Though morbidity was higher in age group >60 years but no statistical difference was found in mortality rate between both age groups. Due to COVID19, multiple changes were made in standard operating procedures (SOPs) for resumption of elective surgeries (Fig. 3) and along with them multiple protocol changes were done for the safety of patients, surgeons, and anaesthesiologists involved (Fig. 4).

Discussion

Cancer is a semi-emergency condition, where any delay in treatment may affect the patients overall survival. Its progression does not stop until and unless an intervention is sought. As COVID pandemic does not seem to halt in near future, considering the risk benefit analysis of cancer patients, we have continued our services by following all the recommendations and guidelines laid by the Government of India. However, we have restricted and

Fig. 2 Clavien-Dindo classification of post-operative complications and grades



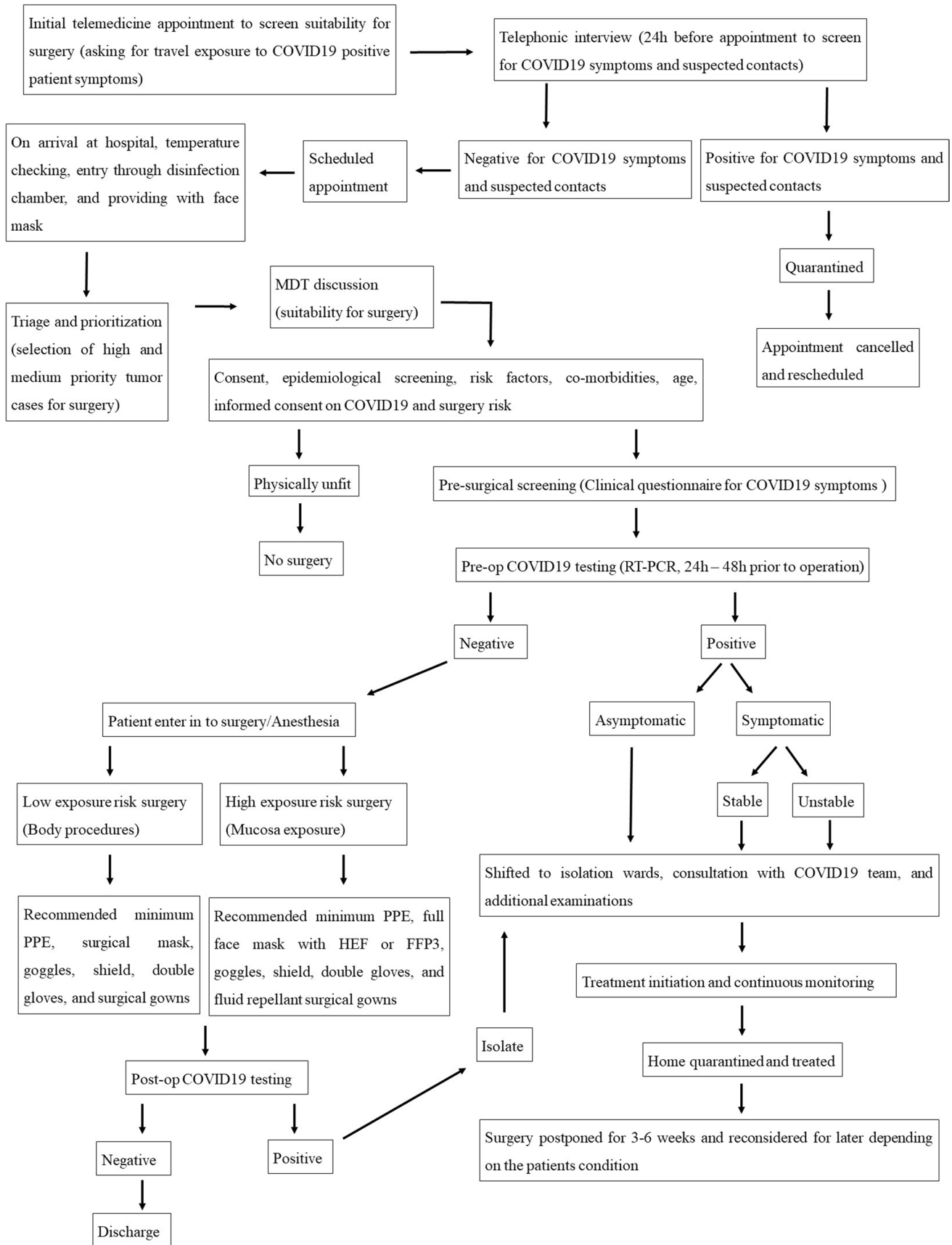


Fig. 3 SOPs followed during COVID19 crisis to perform elective surgeries

Overall change in protocols due to COVID19



Fig. 4 Change in protocols due to COVID19 for the safety of patients, surgeons, anaesthesiologists, and hospital management

streamlined the patients' inflow by performing elective resections, telecommunication, remote care, and e-health.

In a study conducted by Liang et al., results have shown that patients with cancer were more susceptible to infections with poor prognosis compared to non-cancer patients [19]. Cancer patients are also at higher risk of infection by COVID-19. Surgical intervention in such cancer patients is critical and important to limit the disease progression, metastasis, and improve patients overall survival. Very few

studies were conducted and limited data is available to assess the level of elective cancer surgeries safety during a pandemic [19–22].

Ji et al. had performed 621 elective cancer care surgeries safely without showing any risk of COVID infection in high risk patients. Results from the study have also reiterated that by taking standard precautions and following stringent pre-operative measures, any critical risks related to surgeries can be minimised at large without harming the patients [5]. In

a study by Shrikhande et al., 494 elective cancer surgeries were performed and overall, 6 patients were tested COVID positive postoperatively. However, all the COVID positive patients were treated and recovered well without any further complications. The study also confirmed that by combining administrative and scientific rationale, elective cancer care surgeries can be performed safely without any delay [21]. In accordance with the previous studies, the present study also found the safety of elective surgeries and 7 patients were tested COVID positive post-operatively.

The most important thing which has a considerable value for such successful elective cancer surgeries were the efforts taken by MDT (Fig. 3) on taking a multidisciplinary decision on patient's condition, timing of surgery, and the guidelines to be followed throughout the procedure [16]. In view of this, MDT team at our centre was given a free hand in deciding the criteria for patient selection for elective surgery and treatment decisions to be taken on a case-by-case basis, depending on the patients age, stage of cancer, ECOG status, ASA classification, comorbidities, the potentiality to cure, risk of tumour spread, metastasis, risk of nosocomial contamination with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), morbidity, and mortality if untreated [23, 24]. A major consideration was the risk of morbidity, mortality if untreated and chances of survival in case of infected by COVID.

In our study, most of the patients who underwent surgery were male, ASA II categorised, with multiple comorbidities. No surgical restrictions were imposed; varied elective cancer surgeries were performed depending on the severity. Unexpected postoperative events were found to be very low. Only 7 patients and 2 staff have developed COVID postoperatively and recovered well without many complications.

In an international cohort study conducted by COVID-Surg Collaborative in 24 countries, the mortality rate was found to be 23.8% [25], while our study has demonstrated the lowest risk of post-operative COVID infections without any mortality. This might be attributed to the MDT decisions, strict guidelines related to post-operative isolation, experienced surgeons, adopting best surgical practices and treatment strategies followed. However, the promotion of non-operative treatment strategies and postponement of non-urgent surgical procedures was strictly followed in all the patients for their safety, especially in patients aged > 70 years [27–31]. Major complications in our study were observed in patients > 60 years, but it doesn't affect our treatment policies and elective surgical practices. However, no statistical significance was found on comparison of morbidity and mortality rate between the two (< 60 years and > 60 years) age groups.

New SOPs, workflows (Fig. 4) were created for use of the operating theatres (OTs) and their importance was also

emphasised in multiple studies [14, 23, 26, 28–33]. After each surgery, OT was completely disinfected as per disinfection guidelines [34]. The staff involved in the surgery were also encouraged to sanitise before resuming the next surgery or normal activities. Post-surgery, patients were shifted to isolation ward through pre-designated access doors and all the security measures were taken 30 min prior to discharge as per institutional protocols.

After the declaration of COVID as a global pandemic [1], many studies have confirmed the phenomenon of psychological and mental health burden in patients and doctors. To shun any such burden, psychological intervention teams were set up at our centre and regular counselling sessions were done to deal with these challenges and promising results were observed.

To the best of our knowledge, this is the second-largest study on elective cancer surgeries conducted during COVID-19 pandemic from a single cancer centre. Data from this study can be early evidence on surgical management during this COVID pandemic, which can be useful to support different surgical strategies.

At the same time, retrospective and single study institution design could be a limitation for the analysis, but the feasibility of a multicentre prospective study in this pandemic period should be considered in future studies. Other limitations include missing data during the initial days of pandemic and the data represented here is of only three months without a longitudinal follow-up. Even after pre-operative testing, few cases turned out to be COVID positive and symptomatic; there is also a high chance of missing data in asymptomatic carriers.

Conclusion

The data from the present study has shown some promising results with positive outcomes without much complication in conducting elective surgical procedures during pandemic conditions like COVID. Results from the present study can also serve as guidance for other cancer centres around the world, where the dilemma of delaying surgeries is prevalent in view of widespread COVID-related infections.

Additional Contributions

Great appreciation is owed to all of the participants who contributed to our work.

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Author Contribution Concept – R.N., Y.B., Y.V.R.; Design—R.N., Y.B., Y.V.R.; Supervision – R.N.; Materials – R.N., S.R., R.D., A.A., A.M., L.B., M.U., N.K., R.T., Y.B., L.S.P., A.S., K.N.R., P.Y., S.A., B.W.; Data Collection and/or Processing – Y.B., L.S.P., A.S., K.N.R., P.Y., S.A., B.W., Y.V.R.; Analysis and/or Interpretation—R.N., Y.B., Y.V.R.; Literature Search—Y.V.R.; Writing Manuscript—Y.V.R.; Critical Review- R.N., Y.B., Y.V.R.

Data Availability The data analyzed during the current study are not publicly available. They are available from the corresponding author on reasonable request.

Declarations

Ethics Approval and Consent to Participate Ethics committee approval was received for this study from the Ethics Committee of Manavata Clinical Research Institute, India (ESECO19). All patients had consented for the proposed surgery. This is a retrospective analysis of prospectively maintained database which does not necessitate consenting for analysis.

Consent for Publication All authors have consented for publication.

Conflict of Interest The authors declare no competing interests.

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