

SHORT COMMUNICATION

Differences in surgical oncology practice in Greece and Cyprus between the first and second COVID-19 pandemic waves: Lessons from a paradigm shift

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Summary

The SARS-CoV-2 (COVID-19) pandemic has led to the implementation of certain restrictions and rearrangements regarding the surgical oncology operations, thus affecting the surgical lists, the availability of surgical time, along with the consultations of oncologic patients. The purpose of the present study was to identify the differences in surgical oncology practices in Greece and Cyprus between the first and second pandemic waves. We designed a questionnaire for surgeons treating surgical oncology patients. A total of 104 surgeons participated in the present study by answering our question-

naire. According to our outcomes, there was a significant shift between the two waves in patients' willingness to undergo surgery and to present to consultations. Nonetheless, the availability of surgical services remained limited. The consequent mismatch in patients' needs and the availability of healthcare services, we demonstrate herein, is alarming and should be taken into consideration by the policymakers.

Key words: COVID-19, surgical oncology, coronavirus, colorectal surgery, HPB surgery, surgical practice

Since the first wave of the COVID-19 pandemic, certain restrictions have been imposed in scheduled oncologic surgical lists to preserve institutional resources for the potential rise of hospitalizations of patients with COVID-19 [1]. These measures had a direct impact on surgical waiting lists, thus disrupting the treatment pathway and logistics, while raising concerns regarding the potential negative influence on oncologic patients' prognosis [2]. As the national health systems have been adapting to the emerging pandemic conditions, it is crucial to assess the paradigm shift between the first and the second pandemic wave regarding the disruptions

on surgical oncology services. The purpose of the present study was to evaluate surgeons' perceptions regarding the impact of the COVID-19 pandemic on surgical oncology in Greece and Cyprus during the first (03-06/2020) and second (11/2020–01/2021) pandemic waves.

A total of 188 surgeons practicing in Greece and Cyprus received an Email informing them about the survey during the first (06/2020) and second (02/2021) pandemic wave. They were invited to complete a questionnaire using a publicly available format (Google Forms[®]). Nine questions assessed the surgeons' background and speciali-

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zation, and 49 questions assessed the impact of COVID-19 on their surgical practice. A total of 104 surgeons (55.3% response rate) participated during the first call and 71 (37.8% response rate) during the second invitation. A chi-square test was performed to compare categorical variables between the two periods. Comparisons of continu-

ous variables were performed with a two-tailed unpaired t-test for parametric data and Mann-Whitney U-test for nonparametric data. Differences were considered significant with a $p \leq 0.05$. No differences were reported between the two periods regarding the participants' baseline characteristics (Table 1).

Table 1. Participants' characteristics

Demographics	First wave (June), n=104 n (%)	Second wave (February), n=71 n (%)	p value
Female	11 (10.6)	9 (12.7)	0.67
Age groups, years			
18-25	4 (3.9)	3 (4.2)	0.34
26-35	14 (13.5)	12 (16.9)	
36-45	30 (28.8)	25 (35.2)	
46-55	30 (28.8)	23 (32.4)	
56-65	19 (18.3)	7 (9.9)	
66-75	7 (6.7)	1 (1.4)	
Grade			
Residents	15 (14.4)	15 (21.1)	0.30
Specialized Surgeons	19 (18.3)	9 (12.7)	
Consultants	44 (42.3)	35 (49.3)	
Professors	26 (25.0)	12 (16.9)	
COVID-19 Hospital	64 (61.5)	53 (74.6)	0.07
Type of Institution			
University Hospital	57 (54.8)	36 (50.7)	0.65
General Hospital	32 (30.8)	21 (29.6)	
Private Clinic	15 (14.4)	14 (19.7)	
Size of Institution, number of beds			
<100	14 (13.5)	3 (4.2)	0.07
101-200	9 (8.7)	11 (15.3)	
201-500,	42 (40.4)	21 (29.6)	
501-1000	37 (35.6)	35 (49.3)	
>1000	2 (1.9)	1 (1.4)	
Size of ICU, number of beds			
<10	36 (34.6)	16 (22.5)	0.52
11-20	41 (39.5)	32 (45.1)	
21-50	23 (22.1)	20 (28.2)	
51-100	2 (1.9)	2 (2.8)	
>100	2 (1.9)	1 (1.4)	
Surgery volume, Mean (SD)			
Pancreatic surgery	30.47 (29.7)	29.84 (30.4)	0.90
Liver-biliary surgery	25.25 (24.6)	28.65 (24.8)	0.34
Upper GI surgery	32.38 (24.9)	35.54 (26.8)	0.49
Colorectal surgery	110.1 (91.2)	117.5 (98.5)	0.68

n: number; ICU: intensive care unit; SD: standard deviation; GI: gastrointestinal

Table 2. Participants' perceptions on surgical oncology practice during the first and second wave of COVID-19 pandemic

Variables	First wave (June), n=104	Second wave (February), n=71	p value
Patients wish to postpone consultations, n (%)	96 (92.3)	58 (81.7)	0.03
Patients wish to postpone surgery, n (%)	74 (71.9)	40 (33.4)	0.02
Number of consultations has reduced, n (%)	94 (90.3)	57 (80.3)	0.06
Staging is available, n (%)			
Yes, without delay	56 (53.8)	53 (74.6)	0.02
Yes, with delay	44 (42.3)	17 (23.9)	
No	4 (3.8)	1 (1.4)	
Upper GI endoscopy availability, n (%)			
Yes, without delay	44 (42.3)	45 (63.4)	0.02
Yes, with delay	56 (53.8)	25 (35.2)	
No	4 (3.9)	1 (1.4)	
Coloscopy availability, n (%)			
Yes, without delay	44 (42.3)	47 (66.2)	< 0.01
Yes, with delay	55 (52.9)	22 (31.0)	
No	5 (4.8)	2 (2.8)	
EUS availability, n (%)			
Yes, without delay	28 (26.9)	30 (42.3)	0.16
Yes, with delay	25 (24.0)	12 (16.9)	
No, but there was not either prior to COVID-19, n (%)	47 (45.2)	28 (39.4)	
No, due to COVID-19	4 (3.9)	1 (1.4)	
CT, MRI, US availability, n (%)			
Yes, without delay	59 (56.7)	50 (70.4)	0.12
Yes, with delay	43 (41.4)	21 (29.6)	
No	2 (1.9)	0 (0)	
Multidisciplinary Team Meetings, n (%)			
Continue normally	35 (33.7)	32 (45.1)	< 0.01
Continue virtually	26 (25.0)	31 (43.7)	
Continue with reduced members	25 (24.0)	7 (9.8)	
Have been paused	18 (17.3)	1 (1.4)	
Surgical volume reduction,% (SD)			
Pancreatic surgery	25.3 (29.0)	15.5 (18.0)	0.10
Liver-biliary surgery	22.9 (28.8)	16.2 (16.9)	0.63
Upper GI surgery	22.5 (25.9)	16.6 (19.0)	0.33
Colorectal surgery	22.9 (24.0)	14.2 (14.3)	0.06
Reduction of beds availability, n (%)	58 (55.8)	45 (63.4)	0.83
Reduction of surgical time, n (%)	84 (80.8)	58 (81.7)	0.88
Delay between surgery and adjuvant treatment, n (%)	71 (68.3)	45 (63.4)	0.50
Delay between neoadjuvant treatment and surgery, n (%)	67 (64.4)	38 (53.5)	0.15
Increase of patients with non-resectable cancer due to COVID-19, n (%)	86 (82.7)	61 (85.9)	0.57
Decrease of patients' survival due to COVID-19, n (%)	80 (76.9)	56 (78.9)	0.76

n: number; GI: gastrointestinal; CT: computed tomography; MRI: magnetic resonance Imaging; EUS: endoscopic ultrasound; US: ultrasound; SD: standard deviation

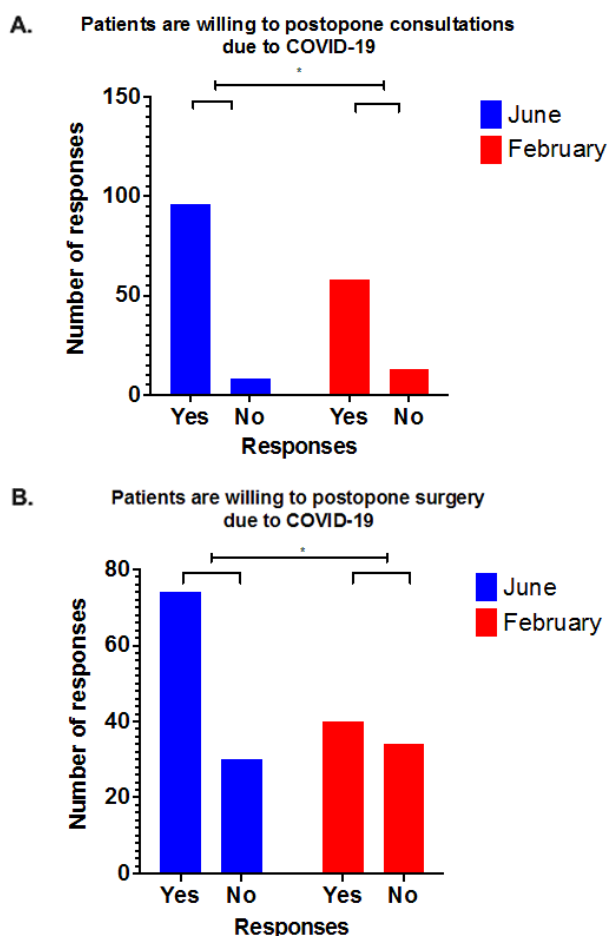


Figure 1. Bar graphs demonstrating the differences between the two pandemic waves in terms of participants' responses regarding patients' willingness to postpone (A) consultations and (B) surgery (* $p < 0.05$).

The results showed a significant decrease in patients' desire to postpone consultations and surgery, normalization of multidisciplinary team (MDT) meetings functionality, along with greater availability of staging, upper gastrointestinal, and colonoscopy services during the second wave compared with the first one (Figure 1, Table 2). Nonetheless, participants expressed similar perceptions regarding the decrease of surgical volume, and availability of surgical time, along with the

delays between neoadjuvant/adjuvant treatment and surgery.

At the beginning of the pandemic, guidelines were published and adopted by different National Health Services on surgical prioritization [3], which recommended delaying elective surgery. In this context, most of the resources were rearranged to support COVID-19 hospitalizations and consequently, a reduced availability was noted in clinical and ICU capacity. This was the primary factor that led to the reported rearrangement of elective/urgent operations. The present findings are in accordance with a previous study that demonstrated similar outcomes in thoracic oncology surgical treatment [4]. However, according to the present study a difference was found regarding the general public's perception in terms of acceptable risk and willingness to undergo surgery and to present in consultations between the two waves. This behavior is in contrast to the low availability of services, since we report a similar volume of surgical operations and time between the two periods, along with the disruption of neoadjuvant/adjuvant treatment and surgery pathway. Besides, we demonstrated the surgeons' concern regarding the potential impact on oncologic patients' survival, a concern that was at similar levels during the two waves. Finally, a significant enhancement has been demonstrated regarding the availability of imaging and endoscopy services, along with the normalization of MDT meetings, mainly attributed to local adaptations of practice instead of changes at a national level. As the pandemic unfolds and vaccinations have started it is crucial that policymakers perceive these certain concerns and risks, thus reforming/increasing the allocation of resources in the field of surgical oncology to face the reported mismatch in patients' needs/desires and surgical services availability.

Conflict of interests

The authors declare no conflict of interests.

References

1. Søreide K, Hallet J, Matthews JB et al. Immediate and long-term impact of the COVID-19 pandemic on delivery of surgical services. *Br J Surg* 2020;107:1250-61. doi:10.1002/bjs.11670.
2. CovidSurg Collaborative. Elective surgery cancellations due to the COVID-19 pandemic: global predictive modelling to inform surgical recovery plans. *Br J Surg* 2020;107:1440-9.
3. Federation of Surgical Specialty Associations. COVID-19 Documents. https://fssa.org.uk/covid-19_documents.aspx (accessed 4 January 2021).
4. Lieven P, Depypere, Niccolo Daddi et al. The impact of coronavirus disease 2019 on the practice of thoracic oncology surgery: a survey of members of the European Society of Thoracic Surgeons (ESTS). *Eur J Cardio-Thorac Surg* 2020 doi:10.1093/ejcts/ezaa284.